



SHAHZADA ADEEL

Relação entre competências empreendedoras e comportamento empreendedor de estudantes do ensino superior

Relationship between entrepreneurial competencies and entrepreneurial behavior among higher education students



Universidade de Aveiro
2022

SHAHZADA ADEEL

Relação entre competências empreendedoras e comportamento empreendedor de estudantes do ensino superior

Relationship between entrepreneurial competencies and entrepreneurial behavior among higher education students



Universidade de
Aveiro
2022

SHAHZADA ADEEL Relação entre competências empreendedoras e comportamento empreendedor de estudantes do ensino superior

Tese apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Doutor em Ciências Económicas e Empresariais, realizada sob a orientação científica da Professora Doutora Ana Dias Daniel, Investigadora Auxiliar, e da Professora Doutora Anabela Botelho Veloso, Professora Catedrática, ambas do Departamento de Economia, Gestão, Engenharia Industrial e Turismo da Universidade de Aveiro

texto Apoio financeiro do POCTI no âmbito do III Quadro Comunitário de Apoio. This work was financially supported by the research unit on Governance, Competitiveness and Public Policy (UIDB/04058/2020), funded by national funds through FCT - Fundação para a Ciência e a Tecnologia.

To my respected parents
and
My beloved wife, dr. Madia Qammar.

o júri

Presidente

Doutor António Luís Jesus Teixeira
Professor Catedrático, Universidade de Aveiro

Vogais

Doutor Soumodip Sarkar
Professor Catedrático, Universidade de Évora

Doutor João José de Matos Ferreira
Professor Associado Com Agregação, Universidade da Beira Interior

Doutora Marisa José Roriz Leiras Ferreira
Professora Coordenadora, Instituto Politécnico do Porto

Doutor Manuel Luís Au-Yong Oliveira
Professor Auxiliar, Universidade de Aveiro

Doutora Ana Isabel Dias Daniel (Orientador),
Investigadora Auxiliar em Regime Laboral, Universidade de Aveiro

agradecimentos

In the name of Allah, The Most Merciful, praise be ALLAH for giving me strength, capability and commitment to complete this journey of three years. This dissertation could not be completed without the mercy that always ALLAH bestowed upon me.

This degree is the result of almost three years of hard work and labor whereby I have been accompanied and supported by many people. It is with pleasure that I now have the opportunity to express my gratitude to all of them.

Before I sign off, I would like to take this opportunity to thank professor Dr. Ana Dias Daniel, my main supervisor and Professor Dr. Anabela Botelho from the bottom of my heart for having enriched my life in so many different ways for over three years. I would like to thank them for their kind guidance, patience, willingness and mentoring throughout this journey of discovery. Thank you professor Dr. Ana Dias Daniel, you have made me what I am today. You are not only a professor but an institution, a legend and an inspiration for me. Thank you very much for developing me in a manner no one else could ever be able to do. Although my contribution is very small like a drop in the ocean, I am really thankful to you for your trust in me. I also acknowledge DEGEIT, University of Aveiro for providing me such a capable platform to develop and polish myself.

I would like to extend my thanks to all those who have helped me directly or indirectly in completion of this study, specially, Seyedeh Azadeh Alavi-Borazjani, Dr. Kaleem Ahmed, Zeeshan Arshad, and all those students who helped me in data collection. I also extend my appreciation to all my respected teachers in Portugal and Pakistan. I would like to say my special thanks to my father, father in law, brothers and all other family members for their prayers, love, support and encouragement to complete this degree.

Last but not the least; I would like to extend my gratitude to my wife Dr. Madia Qammar for her endless support, love, trust and patience throughout my entire journey. I also say thanks to my kids who missed me a lot during the Ph.D. tenure.

palavras-chave Empreendedorismo, Alerta empreendedor, Reconhecimento de oportunidades, Motivação empreendedora, Intenção empreendedora, Comportamento empreendedor.

Resumo

O empreendedorismo é a capacidade dos indivíduos em transformar as ideias em ações, sendo reconhecido como um impulsionador econômico para a sociedade. Este também é considerado um fator importante para a economia de mercado, pois promove a criação de riqueza e empregos. O empreendedorismo ajuda a sociedade a erradicar a pobreza, potencializar a inovação e aumentar sua capacidade produtiva. Considerando que o mundo enfrenta atualmente as consequências da pandemia COVID19, tanto ao nível econômico como social, torna-se ainda mais relevante promover o empreendedorismo, visto que a criação de novas empresas é fundamental para relançar as economias dos países afetados pela pandemia. Assim, a promoção da educação para o empreendedorismo torna-se ainda mais premente.

Os governos e gestores da universidade envidam esforços para incutir o espírito empreendedor nos alunos. Promovendo cursos de empreendedorismo nas universidades. No entanto, alguns investigadores consideraram a educação para o empreendedorismo ineficaz para desenvolver as habilidades certas entre os estudantes universitários, especialmente aquelas relacionadas com o reconhecimento de oportunidades existentes e negligenciadas. Com o objetivo de compreender melhor as competências mais relevantes que devem ser promovidas no contexto da educação para o empreendedorismo, este estudo incidiu sobre os antecedentes do comportamento empreendedor entre estudantes do ensino superior e como estes são afetados pela educação para o empreendedorismo e o género. Mais especificamente, este estudo explora o conceito de alerta empreendedor, como este conceito evoluiu desde a obra seminal de Kirzner em 1973, por meio de uma revisão da literatura. Neste caso, a análise de conteúdo revelou cinco tendências principais de pesquisa em que o alerta empreendedor é considerado um elemento do processo de mercado (2000-2004), uma variável perceptual que influencia a decisão de um indivíduo em se tornar um empreendedor (2005-2008), uma capacidade dinâmica de empreendedores e funcionários (2009-2011), uma habilidade que pode ser desenvolvida por meio da educação (2012-2017), e um fator que influencia o desempenho de uma empresa e uma fonte de vantagem competitiva (2018-2019). Portanto, ao longo dos anos, a investigação sobre o alerta empreendedor alterou o foco do indivíduo para o da empresa, sendo hoje reconhecida como um fator-chave para o sucesso organizacional.

Com base na revisão da literatura, foi proposto um modelo teórico que explora as relações entre o conhecimento prévio, o alerta empreendedor, o reconhecimento de oportunidades, a motivação empreendedora, a intenção empreendedora e o comportamento empreendedor numa amostra de 1290 alunos de três universidades portuguesas. Para testar as hipóteses, os dados foram analisados por meio dos softwares SPSS-25 e AMOS-24. Os resultados mostram que todas as relações são positivamente significativas, dando suporte empírico às hipóteses. Os resultados empíricos também indicam que o alerta empreendedor e o conhecimento prévio são os antecedentes do reconhecimento de oportunidades. Além disso, o conhecimento prévio tem um impacto significativo no alerta empreendedor e no reconhecimento de oportunidades. Mais especificamente, o conhecimento prévio tem um impacto indireto mais forte no reconhecimento de oportunidades por meio do alerta empreendedor em comparação com seu impacto direto. Os resultados também revelaram que o alerta empreendedor tem um impacto direto mais forte no reconhecimento de oportunidades em comparação com seu impacto indireto por meio da motivação empreendedora. Por sua vez, a motivação empreendedora influencia positivamente o reconhecimento da oportunidade e a intenção empreendedora. Da mesma forma, o reconhecimento de oportunidades tem um impacto significativo nas intenções empreendedoras que, por sua vez, influenciam positivamente o comportamento empreendedor dos alunos do ensino superior no contexto português. Os resultados da análise multigrupo mostraram que os alunos matriculados em cursos de educação para o empreendedorismo são mais capazes de reconhecer oportunidades por estarem alertas e de expressar maiores

motivações e intenções empreendedoras, levando a um comportamento empreendedor superior quando comparados aos alunos sem educação para o empreendedorismo. Além disso, ao comparar as respostas de alunos do sexo feminino e masculino, os resultados indicam que os alunos do sexo feminino apresentam menor alerta empreendedor e capacidade de reconhecimento de oportunidades quando comparados aos do sexo masculino.

O presente estudo é novo em vários aspetos. Em primeiro lugar, o presente estudo integrou constructos anteriores para formar um modelo mais abrangente. Em segundo lugar, o estudo explora a relação entre o alerta empreendedor e o desenvolvimento de motivações pessoais específicas, o que não é estudado na literatura. Em terceiro lugar, não existe nenhum estudo utilizando este modelo realizado no contexto português e que tenha sido testado em estudantes do ensino superior.

Keywords

Entrepreneurship, Entrepreneurial alertness, Opportunity recognition, Entrepreneurial motivation, Entrepreneurial intention, Entrepreneurial behavior.

Abstract

Entrepreneurship is an ability of individuals to turn ideas into actions, being acknowledged as an economic driver for society. It is also considered as an important factor for the market economy as it focusses on wealth and job creations. Entrepreneurship helps the society to eradicate poverty, enhance the innovation and increase its productive capacity. Considering, that the world is currently facing the consequences of the COVID19 pandemic, both economically and socially, it is even more relevant to promote entrepreneurship, as the creation of new companies is crucial to relaunch the economies of the countries affected by the pandemic. So, the promotion of entrepreneurship education becomes even more pressing.

The governments and universities' managers put their efforts to instil the entrepreneurial spirits on students, by promoting entrepreneurship courses in universities. However, some researchers found entrepreneurship education ineffective to develop the right skills among the university students, especially those related to the recognition of existing and overlooked opportunities. In order to better understand the most relevant competences that should be promoted in the context of entrepreneurship education, this study focused on the antecedents of entrepreneurial behaviour among higher education students, and how these are affected by gender and entrepreneurship education. More specifically, this study explores the concept of entrepreneurial alertness, how this concept has evolved since the seminal work Kirzner in 1973, through a literature review. In this case, the content analysis revealed five main research trends where entrepreneurial alertness is considered an element of the market process (2000-2004), a perceptual variable that influences an individual's decision to become an entrepreneur (2005-2008), a dynamic capability of both entrepreneurs and employees (2009-2011), a skill that can be developed through education (2012-2017), and a factor that influences a firm's performance and a source of competitive advantage (2018-2019). Therefore, over the years the research on entrepreneurial alertness has evolved from the focus on the individual to that of the company, and it is now recognized as a key factor of organizational success.

Based on the literature review, it was proposed a theoretical model that explores the relationships among prior knowledge, entrepreneurial alertness, opportunity recognition, entrepreneurial motivation, entrepreneurial intention, and entrepreneurial behavior using a sample of 1290 students from three Portuguese universities. To test the hypotheses, data was analyzed using the SPSS-25 and AMOS-24 software. The results show that all relationships are positively significant, lending empirical support to the hypotheses. The empirical findings also indicate that entrepreneurial alertness and prior knowledge are the antecedents of opportunity recognition. Also, prior knowledge has a significant impact on entrepreneurial alertness and opportunity recognition. Moreover, prior knowledge has a stronger indirect impact on opportunity recognition through entrepreneurial alertness compared to its direct impact. Our results also revealed that entrepreneurial alertness has a stronger direct impact on opportunity recognition compared to its indirect impact through entrepreneurial motivation. In addition, entrepreneurial motivation positively influences the opportunity recognition and entrepreneurial intention. Likewise, opportunity recognition has a significant impact on entrepreneurial intentions which, in turn, positively influence the entrepreneurial behavior among higher education students in the Portuguese context. The results of the multi-group analysis showed that students enrolled in entrepreneurship education are better able to recognize opportunities by being alert, and to express higher entrepreneurial motivations and intentions, leading to superior entrepreneurial behaviour when compared to students without entrepreneurship education. Moreover, by comparing the responses of female and male students, the results indicate that female students show lower entrepreneurial alertness and opportunity recognition capacity when compared to their male counterparts.

The present study is also novel in several ways. First, the present study has integrated previous constructs to form a comprehensive model. Second, the study explores the relationship between entrepreneurial alertness and development of specific personal motivations, which is not studied in literature. Third, there is no Portuguese study using this model that has been tested on higher education level students.

Table of Contents

Chapter I.....	1
1 Introduction	2
1.1. Background	2
1.2. Problem Statement	4
1.3. Research Question.....	7
1.4. Research Objectives	8
1.5. Methodology	9
1.5.1. Qualitative Data Analysis Techniques	9
1.5.2. Quantitative Data Analysis Techniques	9
1.6. Organization of the Thesis	10
Chapter II	10
2 Qualitative Analysis: A Systematic and Bibliometric Analysis.....	12
2.1. Introduction	12
2.2. Methodology	14
2.2.1. The sample.....	14
2.2.2. Bibliometric Analysis	15
2.2.3. Content Analysis.....	15
2.3. Results and Discussion.....	15
2.3.1. Descriptive Analysis.....	15
2.3.2. Bibliometric Analysis	17
2.3.3. Content Analysis.....	23
2.4. Conclusion.....	26
2.4.1. Future research avenues.....	26
2.4.2. Limitations.....	28
Chapter III.....	29
3 Quantitative Analysis: Hypotheses Development and Testing	30
3.1. Introduction	30
3.2. Hypotheses Development.....	30
3.2.1. Entrepreneurial Behavior as an Endogenous Variable	30
3.2.2. Prior Knowledge and Opportunity Recognition	31
3.2.3. Prior Knowledge and Entrepreneurial Alertness	32
3.2.4. Entrepreneurial Alertness and Opportunity Recognition	33
3.2.5. Entrepreneurial Alertness and Entrepreneurial Motivation.....	34

3.2.6. Entrepreneurial Motivation and Opportunity Recognition.....	35
3.2.7. Entrepreneurial Motivation and Entrepreneurial Intention	37
3.2.8. Opportunity Recognition and Entrepreneurial Intention	38
3.2.9. Entrepreneurial Intentions and Entrepreneurial Behavior	40
3.3. Development of Conceptual Model	41
3.4. Research Methodology.....	42
3.4.1. Research Design	42
3.4.2. Quantitative Study	48
3.4.3. Overview of Questionnaire.....	53
3.4.4. Data Collection and Sample	54
3.5. Results and Discussion.....	55
3.6. Conclusion.....	90
Chapter IV.....	93
4 General Conclusion, Implications, Limitations and Future Research.....	94
4.1 General Conclusion	94
4.2 Implications	97
4.2.1 Theoretical Implications	97
4.2.2 Practical Implications	98
4.3 Limitations of the study.....	99
4.4 Avenues for Future Research	100
References.....	102
Appendix A- Questionnaire (English Version).....	127
Appendix B- Questionnaire (Portuguese Version)	131

List of Tables

Table 2. 1. The most productive authors on entrepreneurial alertness (c/p = citation per paper).	16
Table 2. 2. The journals with most published research on entrepreneurial alertness	17
Table 2. 3. 25 most cited articles in the entrepreneurial alertness research.....	19
Table 3. 1:Two extreme philosophies in research, adapted from (Saunders et al., 2008, p. 119)	44
Table 3. 2: Difference between Qualitative and Quantitative techniques (Ranjit, 2005)	47
Table 3. 3: Demographic Characteristics.....	61
Table 3. 4: Multicollinearity Assessment	62
Table 3. 5: Reliability Analysis	63
Table 3. 6: Mean, Standard Deviation and Correlation	64
Table 3. 7: Comparison of Universities	65
Table 3. 8: Composite Reliability	68
Table 3. 9: Average Variance Extract (AVE).....	68
Table 3. 10: Factor Loading.....	69
Table 3. 11: Deleted Items	70
Table 3. 12: Fornell-Larcker Criterion.....	71
Table 3. 13: Calculated Fit Indices and Level of Acceptable Fit for Measurement Model.....	72
Table 3. 14: Calculated Fit Indices and Level of Acceptable Fit for Structural Model.....	73
Table 3. 15: Structural Model Results	74
Table 3. 16: Mediation (Indirect Effect) Results	75
Table 3. 17: Fit Indices for Nested Sequence Model in Multi-group Analysis	77
Table 3. 18: Invariance Tests across Gender	78
Table 3. 19: Male vs. Female differences analysis	78
Table 3. 20: Invariance Tests across Entrepreneurship Training.....	80
Table 3. 21: Entrepreneurship Training Multi-group analysis.....	80

List of Figures

Figure 2. 1: Number of Publications per year.....	16
Figure 2. 2: Co-citation of cited references	21
Figure 2. 3: Main keywords associated with the term entrepreneurial alertness per year	25
Figure 3. 1: Conceptual framework	42
Figure 3. 2. Research Onion	43
Figure 3. 3: Inductive and Deductive approaches.....	45
Figure 3. 4: Items of prior knowledge scale	49
Figure 3. 5: Dimensions and items of entrepreneurial alertness.....	50
Figure 3. 6: Items of entrepreneurial motivation	51
Figure 3. 7: Items of opportunity recognition.....	52
Figure 3. 8: Items of entrepreneurial intentions.....	52
Figure 3. 9: Items of entrepreneurial behavior.....	53
Figure 3. 10: Respondent's gender	56
Figure 3. 11: Respondent's university	56
Figure 3. 12: Respondent's nationality	57
Figure 3. 13: Respondent's age.....	57
Figure 3. 14: Respondent's degree.....	58
Figure 3. 15: Respondent's attending year of the degree.....	59
Figure 3. 16: Respondent's training in entrepreneurship.....	59
Figure 3. 17: Respondent's experience	60
Figure 3. 18: CFA Measurement Model	67
Figure 3. 19: Structural Model.....	73

List of Abbreviations

AGFI	Adjusted Goodness Fit Index
AVE	Average Variance Extracted
CB-SEM	Covariance-base Structural Equation Modelling
CFI	Comparative Fit Index
CR	Critical Value
EA	Entrepreneurial Alertness
EB	Entrepreneurial Behavior
EEM	Entrepreneurial Event Model
EI	Entrepreneurial Intention
EM	Entrepreneurial Motivation
GEM	Global Entrepreneurship Monitoring
GFI	Goodness of Fit Index
GGI	Global Gap Index
NFI	Normed Fit Index
OR	Opportunity Recognition
PK	Prior Knowledge
PMF	Promotion Focus
PSED	Panel Study of Entrepreneurship Dynamics
PVF	Prevention Focused
RFT	Regulatory Focus Theory
RMSEA	Root Mean Square Error of Approximation
SEM	Structure Equation Model
SPSS	Statistical Package for Social Science
TLI	Ticker-Lewis Index
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
VIF	Variance Inflation Factor
VMS	Valid Mean Substitute
WEF	World Economic Forum

Chapter I

Introduction

1 Introduction

1.1. Background

Despite the different definitions of entrepreneurship found in the literature, it is usually defined as an individual's ability to turn ideas into actions. It also includes creativity, innovation, risk-taking, ability to plan and manage projects to achieve personal objectives (European Commission, 2019). For this reason, entrepreneurship has been acknowledged as a key driver of economic growth (Badri & Hachicha, 2019; De Vita et al., 2014; Welsh et al., 2016), thereby having a significant impact on society. Moreover, entrepreneurship can be considered as the engine of the market economy as it focuses on wealth creation and employment development within society (European Commission, 2003).

According to the Global Entrepreneurship Monitoring (GEM), the past two decades have registered an increasing trend in entrepreneurship activities, measured by either the Total early-stage Entrepreneurial Activity (TEA) or the Established Business Ownership (EBO), in most of the countries where this survey is implemented, despite the fact that those economies differ in their level of entrepreneurial activity as they have their own culture, as well as their own political, legal and economic legacy (*Global Entrepreneurship Monitor*, 2020). However, it has been noted that only 37% of Europeans would like to start their own business compared to 51% of people in the United States' and China (European Commission, 2019). The multiple reasons that have been pointed out for this difference include:

- i. Insufficient background provided by education to pursue entrepreneurial career;
- ii. Difficulty in accessing funds and markets;
- iii. Difficulty in transferring business;
- iv. Fear of 'punitive' sanctions in case of failure;
- v. Burdensome administrative procedures.

In 2013, the European Commission published the "Entrepreneurship 2020 action plan" aiming at helping countries to overcome the 2008 economic crises, and entrepreneurship education was one of the main identified actions (European Commission, 2013). In this case, the goal was to reinforce the entrepreneurial spirit among Europeans while educating the younger generations about entrepreneurship. In today's times, when the world is facing the consequences of the COVID19 pandemic, both economically and socially, this need is even more relevant, as the creation of new companies is crucial to relaunch the economies of the countries affected by the

pandemic. Moreover, authors like Maryam and Schøtt (2015) argue that entrepreneurship education and training are essential for the development of competencies during the different stages of a person's career, i.e., intending to start a business, starting a business and running a business. Thus, entrepreneurship education plays a vital role in equipping students with the required skills and behaviors necessary for the creation of new ventures (Gundry et al., 2014), and to develop an entrepreneurial mind-set (Hannon, 2007).

Furthermore, the entrepreneurial process is associated with the identification of existing or overlooked market opportunities. Baron (2006, p. 107) states that an "opportunity is the perceived means of generating economic values, i.e. profit that previously has not been exploited and currently is not exploited by other people". Timmons (1994, p. 87) also argues that an opportunity "has the qualities of being attractive, durable, and timely and is anchored in a product or service which creates or adds value for its buyer or end user". Thus, opportunity recognition is a cognitive process which leads to the identification of an opportunity (Baron, 2006), which is central to entrepreneurship.

A relevant question in this area, as discussed by Alvarez and Barney (2007), is whether entrepreneurial opportunities exist and are discovered by entrepreneurs, or whether it is the actions of the entrepreneurs that create opportunities. Thus, the entrepreneurial action is rooted in two apparent divergent theories called "opportunity creation" (Schumpeter, 1934) and "opportunity discovery" (Kirzner, 1979). In the latter theory, competitive imperfections arise exogenously, from changes in technology, consumer preferences or changes in the context within industries or market sectors (Kirzner, 1979), and the entrepreneur's nature is different from that of non-entrepreneurs (Alvarez & Barney, 2007). On the other hand, in the former theory, opportunities are not formed by exogenous shocks; rather, they are endogenously created by the actions and reactions of entrepreneurs. Moreover, according to this theory, entrepreneurs do not "search" to discover the opportunities (Alvarez & Barney, 2007). Nevertheless, in both approaches there is acknowledge that the successful opportunity recognition, its evaluation, and development leads to the creation of a successful business (Ardichvili et al., 2003).

Some cognitive processes influence the opportunity recognition process through which individuals identify the opportunity (Baron, 2006; Barr & Shepherd, 2010). These cognitive processes and skills consist of entrepreneurial alertness (Kirzner, 1973; Tang et al., 2012), prior knowledge (Ardichvili et al., 2003; Ardichvili & Cardozo, 2000), social networks (Nikraftar &

Hosseini, 2016; Singh, 2000), and entrepreneurial learning (Corbett, 2007; Dimov, 2007). Moreover, prior knowledge and entrepreneurial alertness are considered antecedents of opportunity recognition and, thus, have a significant impact on the decision-making criteria (Miao & Liu, 2010). Alertness, active-passive research, and prior knowledge play also a central role in the recognition of opportunities (Baron, 2006).

Kirzner initially introduced the concept of entrepreneurial alertness in 1973, and it has become central to the theory of entrepreneurial alertness. According to Kirzner (1979, p. 48), entrepreneurial alertness refers to the “ability to notice without search opportunities that have hitherto been overlooked”. Nevertheless, according to McMullen and Shepherd (2006), alertness couldn’t be considered unless it is judgment-based and action-oriented. Therefore, “to act on the possibility that one has identified an opportunity worth pursuing” is at the heart of being an entrepreneur (McMullen & Shepherd, 2006).

Thus, due to the relevance of the entrepreneurial process to economic growth, and society in general, it is essential to understand how individuals can engage in new business creation. The theoretical model developed in the present study explores the relationship between these relevant variables and how they may influence the entrepreneurial behavior. In this case, it is proposed that, *ceteris paribus*, stronger entrepreneurial alertness epitomizes the aspiring students’ entrepreneurial capabilities which allow them to successfully leverage opportunity recognition and entrepreneurial intention which, in turn, will increase their tendency to engage in new venture creation activities.

1.2. Problem Statement

Many researchers argue that entrepreneurship is the driver of society (Frederick & Kuratko, 2010), since it can reduce the unemployment level, eradicate poverty, increase innovation and productivity, etc. Given the role of entrepreneurship in society, it is essential to understand how to promote the development of more entrepreneurs and entrepreneurial ventures. The emergence of new ideas and how these ideas can address business opportunities is the keystone of entrepreneurship (Baron, 2006; Short et al., 2010) since entrepreneurship is associated with the discovery and exploitation of profitable business opportunities (Shane & Venkataraman, 2000a). Some researchers have already studied opportunity creation with its other related concept. For example, Alvarez and Barney (2010) explained that objective opportunity is shaped by exogenous shocks and alertness enables the entrepreneur to be aware of those objective

opportunities. Similarly, Gaglio and Katz (2001), more focused on market disequilibrium phenomena, argue that alert individuals are more sensitive than non-alert individuals in opportunity recognition process. According to these authors, the alert entrepreneurs always seek for the objective opportunity accuracy. In the same vein, García-Cabrera and García-Soto (2009) considered alertness as individual's cognitive capabilities that includes previous experience, previous knowledge, personality traits, social network etc. which help the individuals to recognizing the opportunity.

Therefore, one concern of researchers is to understand why, when, and how some of the individuals recognize the opportunities while other(s) do not (Shane & Venkataraman, 2000a). Cognitive exercises can train the mind of individuals to recognize the opportunity (Detienne & Chandler, 2004). However, insufficient research has been conducted so far on the underlying factors that push and motivate alertness in students in order to recognize potential opportunities for new venture creation. The knowledge gap in the existing literature on the role of entrepreneurial alertness in the creation of entrepreneurial firms, through different cognitive factors among higher education students, demands further studies.

Moreover, according to Gelderen et al. (2015), aspiring entrepreneurs who do not act on their entrepreneurial intentions, are not able to develop successful ventures. Nevertheless, such intentions may or may not be turned into real projects due to several factors (Gelderen et al., 2015). In this case, there is an 'intention-behavior' gap, since not all individual's intentions are transformed into actual behavior. Several studies have been conducted to understand how entrepreneurial intentions are transformed into entrepreneurial behavior (EB) with a focus on individual's characteristics, such as demographics (Shirokova et al., 2016), self-identity (Obschonka et al., 2015), self-efficacy (Boyd & Vozikis, 1994), environmental characteristics (Shirokova et al., 2016) and emotions (Gelderen et al., 2015). Additionally, several studies have reported the impact of entrepreneurial motivation on opportunity recognition and entrepreneurial intention. For example, Shepherd and Patzelt (2018b) studied the impact of motivation on entrepreneur's successful opportunity identification. The authors explained that motivation is a key stimulus in the opportunity recognition process as it leads to the development of strategic action. In the same vein, Solesvik (2013) studied motivation as an important measure to predict the entrepreneurial intention and concluded that those who have more entrepreneurial intention to become an entrepreneur seem to have higher entrepreneurial motivation. Similarly, Purwana

and Suhud (2018) highlighted the impact of motivation on entrepreneurial intention of students and observed a positive impact of motivation on entrepreneurial intention. Also, Goel and Madan (2019) studied entrepreneurial motivation as a driving force that leads towards entrepreneurial intention.

However, there is a lack of studies that relate entrepreneurial motivations, opportunity recognition, and entrepreneurial intention together. Thus, the development of the entrepreneurship theory requires an adequate understanding about human motivations. Yet, prior researchers suggested that some motivations are less studied than others (Shane et al., 2003). The entrepreneurial motivation, which is critical to the study of entrepreneurial cognition, entrepreneurial intention, and entrepreneurial behavior, has largely been ignored in the last two decades (Carsrud & Brännback, 2011), which highlights the need to foster studies in this area.

As argued by Levie and Autio (2008), in high-income countries, opportunity perception plays a mediating role in the relationship between the level of post-secondary entrepreneurship education and training and the rate of entrepreneurial activity. Nevertheless, it is reported that the philosophy of self-reliance such as creating a new culture, environment and the sets of values for the attainment of future challenges, etc., is not appropriately included in tertiary education (Arogundade, 2011), and that such failure has led to an unwarranted loss of human capital and resources (Nwangwu, 2007). As a consequence, the growth rate of entrepreneurship programs and courses has been increasing in Europe and Asia but largely remained untracked (Katz, 2003). However, its impact on entrepreneurial activities is still unclear (Brockhaus et al., 2001). On the one hand, some studies indicate that entrepreneurship education has an impact on the propensity of students to start a business; notwithstanding, the extent into which education enables students to become more effective entrepreneurs is still unclear (Cope & Pittaway, 2007). On the other hand, some studies report that entrepreneurship education programs are often surprisingly ineffective while targeting the adult population, e.g. university students (Oosterbeek et al., 2010), in recognizing the opportunities which foster start-up behavior. Due to these divergent results, it is of utmost importance to deepen the analysis of the effects of entrepreneurship education on students' skills and intentions to start a business, which may ultimately provide evidence to policymakers to boost the entrepreneurship field (Volery et al., 2013).

Moreover, several studies document that men and women report different responses about entrepreneurial activities. According to DeTienne and Chandler (2007), men and women use

different opportunity identification processes and there is no difference in their abilities of opportunity identification. Contrary to their results, the academic literature presents, women present greater capabilities to identify business opportunities (Wannamakok & Chang, 2020). On the other hand, men have a higher entrepreneurial intention and entrepreneurial behavior than women (Yordanova & Tarrazon, 2010) as men are intended to start their first significant venture at an earlier age than women (Hisrich et al., 2017).

Contrasting evidence from the extant literature demonstrates that gender issues in entrepreneurship research is still an area that needs attention. Therefore, more work needs to be done to understand what role gender differences play in the field of entrepreneurship.

1.3. Research Question

In light of the literature gaps identified in the previous section, the present study aims at examining the personal factors that affect the development of entrepreneurial intentions, and more specifically how the relationship between prior knowledge, entrepreneurial alertness, entrepreneurial motivation and opportunity recognition, affect the development of entrepreneurial intention and behavior. The preceding research problem may be effectively addressed by converting it into a specific research question. The research question details the anticipated relationship among the studied research constructs/variables and recommends the application of the empirical tests to answer the proposed question (Tharenou et al., 2007). Following this reasoning, the present study aims at addressing the following research question: “What are the antecedents of entrepreneurial behaviour among higher education students, and how those are affected by gender and entrepreneurship education?”

The present study is novel in three ways. First, it integrates previous constructs to form a comprehensive model that enables us to better understand the relationship between several variables in tandem. Previous studies (e.g. Chang et al., 2016; Kautonen et al., 2013; Kraus et al., 2017; Nikraftar & Hosseini, 2016; Purwana & Suhud, 2018; Gelderen et al., 2015) have only explored the relationships between prior knowledge, entrepreneurial alertness, opportunity recognition, entrepreneurial motivation, entrepreneurial intention and entrepreneurial behavior, but none of them have explored the whole model together. Continuing their work, we add to the literature the assessment of how students' entrepreneurial behavior is affected by these variables. Second, the present study explores the relationship between entrepreneurial alertness and

development of specific personal motivations, which is an ill-study topic in the literature as indicated by Fayolle et al. (2014, p. 679) observing that “the role of values and motivations in understanding the entrepreneurial cognitive process deserves closer attention”. In addition, Murnieks et al. (2019, p. 115) argues that despite “the study of entrepreneurial motivation has proceeded, it has done so in a somewhat unorganized manner, leaving us with an incoherent “big picture” of the role of motivation in the entrepreneurial process”. By studying the effect of entrepreneurial alertness on entrepreneurial motivations, the present study adds a new perspective to previous studies that were focused either on intrinsic or extrinsic motivators, but did not consider the interaction and dependence between them. This study considers intrinsic and extrinsic motives conjointly to determine their effects on opportunity recognition and entrepreneurial intention. Moreover, to the best of our knowledge, there is no previous study exploring the relationship between entrepreneurial alertness and both intrinsic and extrinsic motives. The only paper found assesses the impact of entrepreneurial alertness on specific entrepreneurial motivations (i.e. promotion of his/her business idea, improvement of networking and acquisition of product and market knowledge) in the equity crowdfunding context (Troise & Tani, 2020).

Third, the proposed model is tested using novel data collected from higher education students in Portugal thereby adding to the empirical literature evidence on how the dimensions under examination operate in the Portuguese context.

1.4. Research Objectives

The leading objective of the present study is to investigate how prior knowledge, entrepreneurial alertness and entrepreneurial motivation shapes opportunity recognition and entrepreneurial intentions and behaviour in the case of Portuguese higher education students. More specifically, this study aims at the understanding of:

- 1- the main conceptual approaches that have sustained the development of the entrepreneurial alertness research, as well as the main topics and research approaches described in the entrepreneurial alertness literature over time;
- 2- the relationship between entrepreneurial alertness, opportunity recognition, prior knowledge, entrepreneurial motivation, entrepreneurial intention, and entrepreneurial behaviour among university students;
- 3- the effect of various demographic variables (such as gender and entrepreneurship

training) on the relationship between entrepreneurial alertness, opportunity recognition, prior knowledge, entrepreneurial motivation, entrepreneurial intention, and entrepreneurial behaviour among university students.

1.5. Methodology

This study is divided into two phases while using the positivist approach. The first phase elaborates the systematic literature review of entrepreneurial alertness in order to understand the different related concepts and thoughts which lead to the development of the conceptual framework and its justification. In the second phase, a self-administrated questionnaire was developed by adopting already developed/validated scales and measures from the literature. Given that the current study aims at addressing the causal relationships among entrepreneurial alertness, opportunity recognition, prior knowledge, entrepreneurial motivation, entrepreneurial intention, and entrepreneurial behavior, quantitative research was employed. The research strategy consists of the development of hypotheses based on the literature review, new data collection, and use of qualitative and quantitative data analysis techniques. The research methodology used in this study is presented in detail in Chapter III.

1.5.1. Qualitative Data Analysis Techniques

Qualitative data analysis in the current study consists of two stages. First, the bibliometric analysis helps in mapping the literature in a specific research field. Second, content analysis was performed based on the keywords selected after reviewing each article carefully. The details of the qualitative analysis technique is presented in Chapter II.

1.5.2. Quantitative Data Analysis Techniques

Quantitative data analysis in the present study was also conducted in two stages. First, the descriptive analysis, including demographics, missing data treatment, correlation, etc., was performed using the Statistical Package for Social Sciences (SPSS) version-25. Second, the covariance-based structural equation modelling (CB-SEM) was used as it is the most preferred method of estimation by researchers to construct the causal structures when facing more complex theories (Martínez-López et al., 2013; Shook et al., 2004). The details of the quantitative analysis technique are also presented in the research methodology section in Chapter III.

1.6. Organization of the Thesis

This section provides a snapshot of the present study and its organization into different chapters. Chapter I provides the introduction of the study which includes the study background, problem statement, research question, contribution, research objectives, methodology of the study, and a brief overview of the remaining chapters.

Chapter II provides a systematic and bibliometric literature review on the concept of entrepreneurial alertness by searching the Scopus database. It shows how the concept was firstly presented by Kirzner in 1973, and how it evolved. Moreover, this chapter provides the primary constructs related to entrepreneurial alertness which connect it with the entrepreneurship literature. This systematic literature review leads to the development of a hypothetical model. A slightly modified version of this chapter has been recently published in Daniel, A.D, Adeel, S., Botelho, A. (2021), “Entrepreneurial Alertness Research: Past and Future”, *SAGE Open*, 11(3), <https://doi.org/10.1177/21582440211031535> (Journal indexed in WoS and SCOPUS - Q2 as per the last available 2020 metrics).

Chapter III provides the theoretical model and its justification derived from the literature review. It explains how the exogenous construct has an impact on other endogenous variables. For example, it addresses how entrepreneurial alertness has an impact on opportunity recognition among the higher education students of Portugal. Chapter III also provides the research methodology of the thesis. It includes the research hypotheses to be tested based on the hypothetical conceptual model. It also presents the research philosophy, research design, research approach, and research strategy adopted. In addition, Chapter III provides the results of the study, including the preliminary results and the main results by using SPSS-25 and AMOS-24, respectively. The preliminary results are based on demographics, missing data treatment, multicollinearity, normality and reliability of data, and descriptive results. The main results include the measurement model, model fit indices, and structural model to examine proposed causal relationships. Furthermore, it provides the discussion of each variable based on its statistical relationship (as *per* the results found), focusing on whether the proposed causal relationships are empirically supported or not.

Chapter IV presents the general conclusions of the study, theoretical and practical implication, limitations of the study and avenues for future research, respectively.

Chapter II

Qualitative Analysis: A Systematic and Bibliometric Analysis

2 Qualitative Analysis: A Systematic and Bibliometric Analysis

2.1. Introduction

Entrepreneurial alertness is a concept that “has the potential to add substantially to our understanding of how new ideas get initiated and pursued” (Tang et al., 2012). According to Baron (Baron, 2006), “alertness refers to the capacity to recognize the opportunities when they exist-when (...) have emerged changes in technology, market, government policies, competitions, and so on”, and as Zaheer and Zaheer (1997, p. 1496) explained, it is the “proactive attentiveness to information, especially of a private nature, about the environment; figuratively having one’s antenna out”. Moreover, alertness requires being “plugged in” to information networks in this era of fast and intensive technological settings (Zaheer & Zaheer, 1997). Through a systematic literature review, Sharma (2019) has identified the core components of alertness construct, namely sensing and searching information, cognitive ability, personality factors (like creativity and self-efficacy), environment, social networks, knowledge and experience. Therefore, entrepreneurial alertness is at the heart of the entrepreneurial process, because without the identification of a viable business opportunity there is no entrepreneurship.

In the context of a company, entrepreneurial alertness is considered a capability to sense and detect the marketplace ignorance and is, therefore, relevant for the identification of opportunities for action (Sambamurthy et al., 2003). Marketplace ignorance occurs when some firms ignore or miss out opportunities, which are exploit by other firms, ultimately contributing to enhancing their span for entrepreneurial action (Sambamurthy et al., 2003). It is argued by Smith and Gregorio (2002) that entrepreneurial action is a creative and subjective process, and it occurs when a firm: (i) integrates pre-existing knowledge; (ii) detects an opportunity; and (iii) acts upon the opportunity.

Despite the growing number of publications since 2006, which reveals the importance of entrepreneurial alertness as an emerging research topic, this is still an ambiguous and fuzzy concept (Norton & Hale, 2011). As a consequence, researchers have approached entrepreneurial alertness in a multidimensional way, relating it to luck (Demsetz, 1983), market sense (Sambamurthy et al., 2003), intuition (Dane & Pratt, 2007), and recognition of opportunities (Baron, 2006). The role of entrepreneurial alertness is still a matter of debate in the process of opportunity identification (Tang et al., 2012), where only a limited number of empirical studies are found in the literature (Ahmed et al., 2019; Mitchell et al., 2007). Moreover, and despite the

systematization performed by Sharma (2019) concerning the core components of alertness, the proliferation of definitions and concepts related to entrepreneurship brings an increasing complexity to the study of entrepreneurial alertness, which demands more integration between this concept and other theoretical approaches and concepts in the field of entrepreneurship. In this regard, entrepreneurial alertness research faces several challenges, namely the need to promote more empirical research on the nature and implications of entrepreneurial alertness in the context of entrepreneurs and companies, as well as the need to integrate this concept with other theoretical approaches in the field of entrepreneurship, thereby contributing to the development of a coherent theoretical frame that clarifies the role of entrepreneurial alertness in the entrepreneurial process and in the growth of companies and other organizations. In this context, the present chapter aims to understand the trends in entrepreneurial alertness' research during the past decades, and, more specifically, to i) examine which conceptual approaches have sustained the development of the research in this field; ii) identify the main topics and research approaches described in the entrepreneurial alertness' literature over time; and, iii) identify the main theoretical and methodological challenges in this research field, which constitute future research avenues. To fulfil these objectives, a bibliometric and content analysis has been performed to clarify the concept of entrepreneurial alertness, identify main research gaps, and research trends. Through these analyses, it was possible to identify the main research fields that underpinned research on entrepreneurial alertness, namely the fields of economics and strategy, entrepreneurship and psychology. Moreover, over the years, the research on entrepreneurial alertness has been characterized by a set of waves of preferred trends, which provide clues for setting future research trends. Thus, this study has useful implications for academics, as it provides clues for young or new researchers who wish to develop research in this field, as well as for policy makers who are responsible for designing policies to foster entrepreneurship. These aspects are even more relevant in the current pandemic context, where there is a need to revitalize the economy in order to minimize the impacts of the current economic crisis.

The remainder of the chapter is structured as follows. Section two explains the methodology used to conduct the review and the software used for data analysis. Section three provides the results and discussion, and then follows the conclusions, future research avenues, and the main limitations of this study.

2.2. Methodology

The literature on entrepreneurial alertness is fragmented across different research fields and disciplines. Therefore, to organize and disseminate the knowledge produced so far, we opt to perform a bibliometric and content analysis combining both quantitative and qualitative methods. These methods are gaining relevance in multiple research fields (Ribeiro & Cirani, 2013) due to their key principles of transparency, clarity, integration, focus, equality, accessibility and coverage that contribute to avoid common biases of traditional literature reviews, thereby improving the quality of the review process and outcomes (Pittway, 2008).

Scopus was defined as the database to categorize all of the major contributions in the field of entrepreneurial alertness. The main reason for this selection is based on the results obtained by Adriaanse and Rensleigh (2013) who found that Scopus has fewer inconsistencies (such as author spelling and sequence, volume and issue number) regarding content verification and content quality when compared to ISI Web of Science (WOS) and Google Scholar (GS). Moreover, Scopus covers a wider range of journals, and consequently has a higher number of articles than WOS (Falagas et al., 2008), despite being limited to articles published after 1992. The data was retrieved from the Scopus database on the 8th of November 2019.

2.2.1. The sample

To extract all relevant articles from the Scopus database, two search queries were used. In the first search, 161 relevant articles were found using the following search query: Entrepreneur* AND Alertness. In the second search, “Entrepreneur* Alertness” was applied and 93 relevant articles were found from the discussed field. The asterisk (*) was used as a truncation symbol to search for words with different endings (Granados et al., 2011). The search was limited to subject areas of business management and accounting, economics, econometrics and finance, and social sciences. Next, our search was confined to document type based on the article, source type which represents journal and to the English language. Therefore, a total set of 254 articles were retrieved from the SCOPUS database, ranging from 1992 to 2019. The purpose behind the starting year of 1992 is that the first published article on the database dates from that year.

All retrieved articles were arranged to detect potential duplications since, in both searches, the employed queries resembled each other. Therefore, after careful analysis, 90 duplicated articles were detected and hence deleted. A new set of 164 articles was used for further analysis.

Finally, every article was reviewed to analyze its relevance within the theme of research. Then, it was found that 32 articles were not related to the topic, or were irrelevant, and were deleted accordingly. After the deletion of irrelevant articles, a final set of 132 articles was obtained and used for further analysis.

2.2.2. Bibliometric Analysis

The bibliometric analysis enables the mapping of existent literature in a given research field, determining its roots, evolution, and structure through the identification of publications by year, main authors, main keywords, the relationship between authors, and the citation network of the articles in the sample. For this analysis, it was used the VOSviewer 1.6.8 software (Van et al., 2009, 2011, 2018; Waltman et al., 2010), which also allowed to find the emerging areas by developing a network of themes. To identify the structural aspect of the scientific field, the co-occurrence frequency was used to build a map.

2.2.3. Content Analysis

To perform the content analysis, all articles were downloaded and carefully read in order to identify keywords, main topics discussed, as well as the main results and conclusions. All articles were separately classified by the author and the supervisor of this thesis to ensure the reliability of classification. At the end, all classifications were brought together and, in the case of divergent classification, each article in question was discussed to reach a consensus concerning their categories.

The keyword analysis was performed based on the keywords selected by the team for each article in our sample, as well as its frequency considering all articles published in a specific year.

2.3. Results and Discussion

2.3.1. Descriptive Analysis

The first publication related to the topic of alertness is dated on 1904 in the journal “psychology bulletin” published by the American Psychology Association as a publisher. It did not reveal the concept of alertness within the field of entrepreneurship, but it focused on measuring the mental intelligence or mental alertness. Figure 2. 1 shows the number of publications between 2000 and 2019. Throughout the years, the number of articles is increasing, especially after 2013, which shows the growing interest of researchers in this field.



Figure 2. 1: Number of Publications per year.

Table 2. 1 shows a list of the most important and productive authors concerning entrepreneurial alertness. Although there is no considerable difference in terms of the number of publications per author, the same is no longer the case regarding the total number of citations and citations per paper. The most productive and impactful authors in this domain are Maria Minniti and Robert Alan Baron.

Table 2. 1. The most productive authors on entrepreneurial alertness (c/p = citation per paper).

Ranking	Author	N. Publication	Total Citation	h-index	c/p
1	Fiet, J.o.	4	186	4	46.5
2	Montiel-Campos, H.	4	2	1	0.50
3	Norton, W.I.	4	77	3	19.3
4	Tang, J.	4	372	4	93
5	Minniti, M.	3	657	3	219
6	Patel, P.C.	3	56	2	18.7
7	Urban, B.	3	10	2	3.3
8	Ashouriazdeh, S.	2	27	2	13.5
9	Baron, R.A.	2	569	2	284.5
10	Boso, N.	2	24	2	12

Another way to calculate the productivity and performance of the authors at the micro-level is the Hirsch index, or h-index, proposed by Hirsch in 2005. The Hirsch index or h-index is a vigorous indicator of performance measurement at the individual scientist level (Hirsch, 2005), quantifying the number of publications of a scientist that received at least h citations each.

Through the analysis of Table 2. 1, it is possible to conclude that every author has a similar h-index regarding the number of publications in the entrepreneurial alertness field.

In turn, journal importance can be measured on the bases of citations and impact factors in each category of specialization. Table 2. 2 presents a list of journals that published more research on entrepreneurial alertness. In terms of citations, both the Journal of Small Business Economics and the Journal of Business stand out.

Table 2. 2. The journals with most published research on entrepreneurial alertness

Rankings	Journals	N. Publication	Citation
1	Journal of Small Business Economics	9	1648
2	Journal of Business Venturing	7	1971
3	International Journal of Entrepreneurship and Small Business	6	40
4	Journal Des Economistes Et Des Etudes Humaines	6	11
5	Review of Austrian Economics	6	335
6	Journal of Small Business Management	5	245
7	Academy of Entrepreneurship Journal	4	6
8	International Entrepreneurship and Management Journal	4	109
9	Journal of Business Research	4	54
10	Social Behavior and Personality	4	31

2.3.2. Bibliometric Analysis

2.3.2.1. Analysis of the most cited articles

Table 2. 3 presents the studies conducted on entrepreneurial alertness which have received the highest number of citations in recent years. In this table, the studies have been ranked from 1 to 25 based on the total number of citations (ranging from 131 to 3514) and the number of citations per year (ranging from 11.27 to 206.70). According to this classification, the work performed by Ardichvili et al. (2003), entitled “A theory of entrepreneurial opportunity identification and development”, ranks first with the highest number of total citations, as well as citations per year, followed by an article published by Sambamurthy et al. (2003), entitled “Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms”. Achieving such a high ranking in terms of citation is an indication of the high contribution of these two studies in the development of the concept of entrepreneurial alertness. Other scientists who have valuable contribution towards the concept of entrepreneurial alertness with more than

500 citations are Gaglio and Katz (2001), Baron (2006), Kaish and Gilad (1991), Gelderen et al. (2008), and Kirzner (1999).

2.3.2.2. Analysis of the intellectual structure of the research field

The co-citation of cited references network (Figure 2. 2) identifies similarities between articles by assessing whether articles cite the same references. This analysis can clarify the intellectual structure of the field and map the way researchers relate to one another, as well as illustrate the role and importance of a given reference for the research question under analysis. A minimum of ten citations of cited references was considered suitable for this study. The network is composed of 22 articles organized into 4 clusters.

The first cluster, in blue, is composed of authors who have their roots in the economics and strategy fields, such as Israel Kirzner, Sankaran Venkataraman, James O. Fiet, and Jay Barney. Israel Kirzner is the most cited author with 315 citations. He is considered one of the leading exponents of the Austrian School of Economics, and his contributions to the study of the dynamics of capitalism are unquestionable. Through his extensive published work, Kirzner has presented his view on how the competitive market process works, and the role of knowledge and discovery in the market equilibration process (Kirzner, 1973, 1976, 1997, 1999), which “differs in character and content from a good deal of neoclassical theory” (Kirzner, 1997). Unlike the neoclassical approach, the Austrian approach views the entrepreneurial discovery as the systematic process of overcoming sheer ignorance by increasing mutual awareness among market participants, thereby leading markets towards equilibrium (seen as the absence of sheer ignorance). In this case, entrepreneurs are key elements in searching for, discovering and exploiting profitable opportunities, such as asserted by Mises (1949, p. 325) “the driving force of the market process is provided neither by the consumers nor the owners of the means of production – land, capital goods, and labor – but by the promoting and speculating entrepreneurs”. The entrepreneur is, therefore, able to discover previously overlooked profit opportunities, in conditions of market disequilibrium, due to his daring, imaginative, and speculative actions which are characteristic of its alertness (Kirzner, 1997).

Table 2. 3. 25 most cited articles in the entrepreneurial alertness research

Authors	Articles	Journal	Year	Citation	R^a	Cit./Year	R^b
Ardichvili et al.	A theory of entrepreneurial opportunity identification and development	Journal of Business Venturing	2003	3514	1	206.70	1
Sambamurthy et al.	Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms	MIS Quarterly: Management Information Systems	2003	3087	2	181.58	2
Gaglio et al.	The Psychological Basis of Opportunity Identification: Entrepreneurial Alertness	Small Business Economics	2001	1629	3	85.73	5
Arenius, P., Minniti, M.	Perceptual variables and nascent entrepreneurship	Small Business Economics	2005	1544	4	102.93	4
Baron, R.A.	Opportunity recognition as pattern recognition: How entrepreneurs "connect the dots" to identify new business opportunities	Academy of Management Perspectives	2006	1477	5	105.5	3
Kaish, S., Gilad, B.	Characteristics of opportunities search of entrepreneurs versus executives: Sources, interests, general alertness	Journal of Business Venturing	1991	1033	6	35.62	10
Gelderen et al	Explaining entrepreneurial intentions by means of the theory of planned behaviour	Career Development International	2008	761	7	63.41	7
Kirzner, I.M.	Creativity and/or alertness: A reconsideration of the Schumpeterian entrepreneur	Review of Austrian Economics	1999	738	8	35.14	11
Levie, J., Autio, E.	A theoretical grounding and test of the GEM model	Small Business Economics	2008	548	9	45.66	8
Frese, M., Gielnik, M.M.	Modern Theories of Entrepreneurial Behavior: A Comparison and Appraisal the Psychology of Entrepreneurship	Annual Review of Organizational Psychology and Organizational Behavior	2014	481	10	80.16	6
Agarwal, R., Selen, W.	Dynamic capability building in service value networks for achieving service innovation	Decision Sciences	2009	437	11	39.72	9
Forbes, D.P.	Cognitive approaches to new venture creation	International Journal of Management Reviews	1999	282	12	13.42	22
Yu, T.F.U.-L.	Entrepreneurial alertness and discovery	Review of Austrian Economics	2001	268	13	14.10	21
Fiet, J.O.	A prescriptive analysis of search and discovery	Journal of Management Studies	2007	247	14	19	17
Minniti, M.	Entrepreneurial alertness and asymmetric information in a spin-glass model	Journal of Business Venturing	2004	216	15	27	15

Table 2.3. (Continued)

Authors	Articles	Journal	Year	Citation	R ^a	Cit./Year	R ^b
Chell, E.	Review of skill and the entrepreneurial process	International Journal of Entrepreneurial Behaviour & Research	2013	216	16	30.85	14
Tominc, P., Rebernik, M.	Growth aspirations and cultural support for entrepreneurship: A comparison of post-socialist countries	Small Business Economics	2007	178	17	13.69	23
Tang, J.	Environmental munificence for entrepreneurs: Entrepreneurial alertness and commitment	International Journal of Entrepreneurial Behaviour & Research	2008	176	18	14.66	20
Kontinen, T., Ojala, A.	International Opportunity Recognition among Small and Medium-Sized Family Firms	Journal of Small Business Management	2011	172	19	19.11	16
Sambasivan et al.	Impact of personal qualities and management skills of entrepreneurs on venture performance in Malaysia: Opportunity recognition skills as a mediating factor	Technovation	2009	170	20	15.45	19
Ko, S., Butler, J.E.	Creativity: A key link to entrepreneurial behavior	Business Horizons	2007	165	21	12.69	24
Fiet, J.O., Patel, P.C.	Entrepreneurial discovery as constrained, systematic search	Small Business Economics	2008	141	22	11.75	25
George et al.	A systematic literature review of entrepreneurial opportunity recognition: insights on influencing factors	International Entrepreneurship and Management Journal	2016	136	23	34	12
Westhead, P., Solesvik, M.Z.	Entrepreneurship education and entrepreneurial intention: Do female students benefit?	International Small Business Journal: Researching Entrepreneurship	2016	134	24	33.5	13
Valliere, D.	Towards a schematic theory of entrepreneurial alertness	Journal of Business Venturing	2013	131	25	18.71	18

^aR stands for the rank of author, article, journal, year and citation in the table

^bR stands for the citation per year for all articles in the table

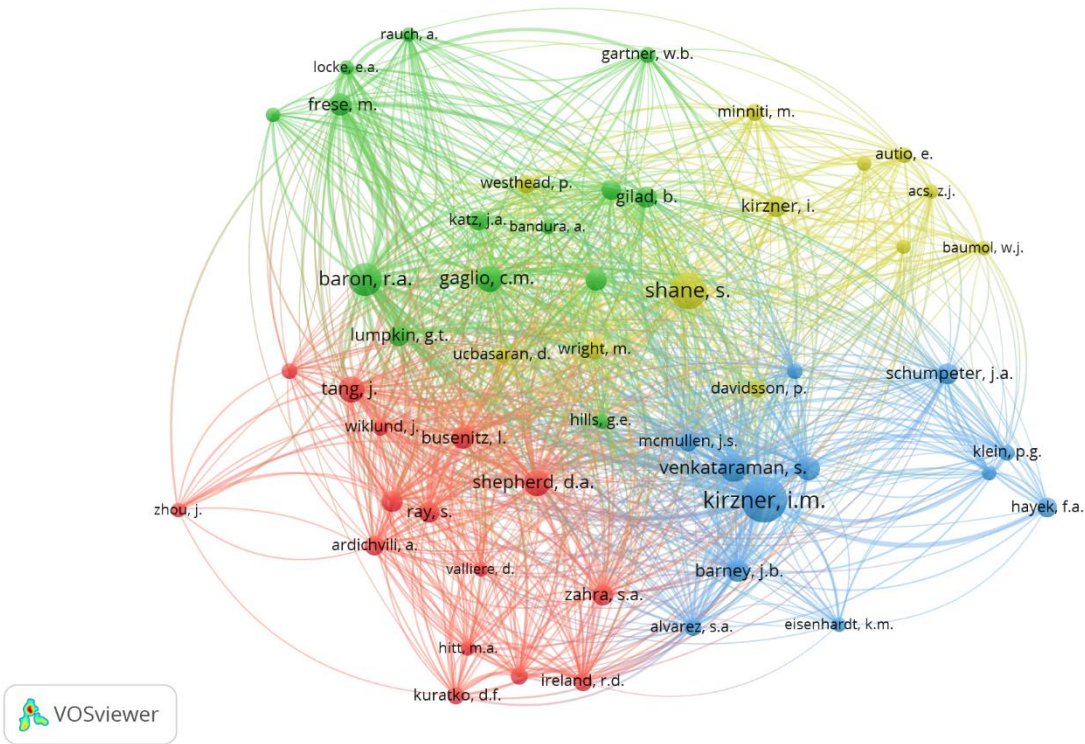


Figure 2. 2: Co-citation of cited references

In this vein, Venkataraman (Sarasvathy & Venkataraman, 2011; Shane & Venkataraman, 2000b; Venkataraman, 1997) and Fiet (Fiet & Patel, 2008; Fiet, 2007) argue that the discovery process is at the heart of entrepreneurship and, therefore, should be a key aspect to be explored and understood through entrepreneurship research.

The second cluster, in yellow, comprises researchers who focus mainly on the study of entrepreneurship from a behavioral perspective. In this case, Scott A. Shane is the most cited author with 202 citations. He has studied how entrepreneurs discover and evaluate opportunities, assemble resources, and design organizations. In his book ‘A general theory of entrepreneurship: the individual opportunity nexus’ (Shane, 2003), it is proposed that “entrepreneurship can be explained by considering the nexus of enterprising individuals and valuable opportunities”, thereby highlighting that human agency plays a key role in the entrepreneurial process. In addition, he assumes that entrepreneurship is not solely the result of human action, but also a consequence of external factors, such as the status of the economy, the availability of venture

capital, the actions of competitors, and government regulations (Shane et al., 2003). In this context, he has proposed a framework that aggregates both environment-centric and individual-centric approaches to explain the variance of entrepreneurial activity. This framework, which has served as the basis for many other studies over the years, examines the characteristics of opportunities, as well as of the individuals who discover and exploit them, the process of resource acquisition and organization, and the strategies used to exploit and protect the profits from those efforts. In the same vein, Paul Westhead and Mike Wright, also two of the most cited authors, have published several relevant articles exploring the role of entrepreneur's human capital on opportunity identification and pursuit (Ucbasaran et al., 2008).

The third cluster, in green, comprises mainly researchers from the field of psychology, who use a cognitive approach to the theory of entrepreneurial alertness, such as Robert A. Baron (the most cited author with 158 citations), Connie Gaglio, Michel Frese, and George Lumpkin. R. Baron is widely recognized as one of the leading scholars in the field of cognitive and social factors in entrepreneurship, having contributed to linking these two distinct academic disciplines - psychology and entrepreneurship. Cognitions have been defined as all mental actions or processes involved in acquiring and processing information that is necessary for everyday living (Magni & Bilotta, 2016). According to Baron (1998, p. 288), "entrepreneurs' thinking may differ, in important ways, from that of other persons", particularly because they are able to identify opportunities for new ventures by using cognitive frameworks (e.g. prototypes, examples) that they have acquired through experience which enables them to "connect the dots" between seemingly unrelated events or market trends (Baron, 2006). This framework also suggests that active search, alertness, and prior knowledge operate together in the opportunity recognition process. More specifically, Gaglio and Katz (2001) argue that entrepreneurs possess a schema of entrepreneurial alertness, which is a mental model that represents an individual's knowledge about the presence of market disruptions or their potential occurrence. Another relevant aspect of the "pattern recognition" perspective is that a person can be trained to become more proficient in this task "by teaching them not merely to be "alert" to opportunities or to search actively for them, but rather, to search in the best places and in the best ways" (Baron, 2006).

The last cluster, in red, includes researchers who investigate entrepreneurship from a cognitive perspective. This is the case of Dean Shepherd, the most cited author with 103 citations, Jintong

Tang, and Lowell Busenitz. These researchers have investigated entrepreneurs' decision-making process involved in leveraging cognitive and other resources to act on opportunities, as well as in the development of new ventures (McMullen & Shepherd, 2006; Shepherd & DeTienne, 2005b). Additionally, Wiklund and Shepherd (2013) have studied the role of entrepreneurs' motivations in growth, which has contributed to unveil the process of small business growth. In turn, Tang et al. (2012) have proposed a model involving three distinct elements of alertness: scanning and search, association and connection, and evaluation and judgment, and have proposed and validated an alertness scale which was further adopted in many studies over the years.

2.3.3. Content Analysis

This type of analysis covers all the articles available since its aim is to gain and enhance an understanding of the evolvement of the entrepreneurial alertness research field. Through the analysis of the selected papers, it is possible to establish a timeline of the most frequent keywords associated with entrepreneurial alertness per year (Figure 2. 3). In this case, we uncover five main waves which represent the main topic trends.

In the first wave (2000-2004), entrepreneurial alertness is mostly associated with terms related to the market process theory (Kirzner, 1992), in particular related to the gathering of new market information. For instance, Yates (2000) discusses the role of alertness in the entrepreneurial discovery function. He uses the case of the used car market to study market equilibrium, through the perspective of standard and entrepreneurial sellers. In this case, entrepreneurial sellers are aware that they do not possess all knowledge, so they remain alert to the possibility that they may discover relevant information about market conditions that would allow them to raise prices when market demand increases. Thus, entrepreneurial discovery is not considered the same as deliberate learning or the result of random luck, since entrepreneurs choose to be alert and to expect the unexpected.

In the same line of thought, Yu (2001) discusses the concept of entrepreneurial alertness from the subjectivist perspective, where entrepreneurs interpret incoming information differently from the general public. Thus, entrepreneurs are able to profit from opportunities by doing some things in a different way than the traditional way. Minniti (2004) argues that the existence of asymmetric information is crucial for entrepreneurial activity since the results of spin-glass simulation show that if the information is not evenly distributed, entrepreneurship is shown to increase and concentrate geographically.

In a second wave (2005-2008), entrepreneurial alertness is considered a perceptual variable that influences individuals' decision to become entrepreneurs (Arenius & Minniti, 2005), and is, therefore, related with the entrepreneurial behaviour. In the study of Arenius and Minniti (2005), that used a large sample of individuals in 20 countries, it was observed that perceptual variables were significantly correlated with new business creation across all countries and across individuals' gender.

Other studies focused on the role of entrepreneurial alertness in the promotion of entrepreneurial behavior. On the one hand, Tang (2008) concluded that entrepreneurial alertness is associated with self-efficacy in performing the roles and tasks of new venture creation. On the other hand, Gelderen et al. (2008) investigated the entrepreneurial intentions of business students, and their results showed that the two most important variables explaining entrepreneurial intentions are entrepreneurial alertness and financial security. Likewise, alertness along with other key variables drives entrepreneurial creativity which becomes ever more important with its link to entrepreneurial behavior (Stephen & John, 2007).

The third wave (2009-2011) encompasses a set of studies that consider entrepreneurial alertness as a dynamic capability not only relevant for entrepreneurs, but also to employees since they can boost corporate entrepreneurship. According to Agarwal and Selen (2009), managers' higher-order capabilities, such as customer engagement, collaborative agility, collaborative innovative capacity and entrepreneurial alertness, influence the service innovation outcome. In the same vein, Simsek et al. (2009)'s study with 495 SMEs observed that an entrepreneurially alert information system imparts a significant positive influence on corporate entrepreneurship. Moreover, entrepreneurial alertness seems relevant when a firm explores opportunities for entering into a foreign market (Kontinen & Ojala, 2011).

Fischer (2011) argues that knowledge management can raise the level of an individual's alertness in the opportunity recognition process, and therefore may influence service innovation in professional service firms.

In the fourth wave (2012-2017), there is a number of studies that considered entrepreneurial alertness as a skill that can be developed through entrepreneurship education. According to Chell (2013), skills are not the same as competences or abilities. Skills are multidimensional constructs that once acquired tend to be assumed implicitly in the action without conscious thought. In turn, competencies are related to the notion of being competent or

proficient, and refers to a mix of knowledge, skills, abilities, and sometimes other attributes as well (Chell, 2013). Therefore, education has a crucial role in upgrading people’s skills.

For example, Solesvik (2013) demonstrated that entrepreneurship taught students with entrepreneurial alertness assets present a higher entrepreneurial mind-set. Similarly, entrepreneurship education makes individuals more alert to the opportunity identification process (Chang et al., 2014; Ghasemi & Rowshan, 2016; Hu & Ye, 2017; Li et al., 2015).

In turn, several studies have concluded that prior knowledge has a significant impact on entrepreneurial alertness among university students (Hajizadeh & Zali, 2016; Li et al., 2015; Park et al., 2017). Moreover, Westhead and Solesvik (2016) found that female students having entrepreneurship education and that presented entrepreneurial alertness skills demonstrated a higher entrepreneurial intention.

Finally, **the fifth wave (2018-2019) encompasses a set of papers where entrepreneurial alertness is considered an organizational factor that influences a firm’s performance and is a source of competitive advantage.** According to Roundy et al. (2018), there is a direct effect of entrepreneurial alertness on strategic change decisions and organizational performance. Moreover, those researchers have observed a synergistic influence of entrepreneurial alertness and other cognitions, including issue categorization and assessments of uncertainty, on strategic decisions. Similar results were obtained by other researchers such as (Adomako et al., 2018; Rezvani et al., 2018; Tsou & Cheng, 2018; Urban, 2019; Zanella et al., 2019).



Figure 2. 3: Main keywords associated with the term entrepreneurial alertness per year

In fact, Rezvani et al. (2018) propose a new framework for organizational entrepreneurial alertness in opportunity discovery at the individual, group, and organizational levels through the use of the meth-synthesis approach. Moreover, Antonacopoulou et al. (2019) have revived the learning organization concept and propose a new framework (the 8As) which illustrates how alertness along with attentiveness, awareness, appreciation, anticipation, alignment, activation and agility form an integral part of the New Learning Organizations.

2.4. Conclusion

This chapter reviews and analyzes the concept of entrepreneurial alertness, as well as the research that has been developed around it. Since the seminal work of Kirzner in 1973, entrepreneurial alertness research has attracted the attention of researchers from different research fields, such as economics and strategy, entrepreneurship, and psychology. As a consequence, entrepreneurial alertness has been studied from different perspectives, not just from the individual's perspectives where the focus is on understanding how and why entrepreneurs spot opportunities, but also from the perspectives of companies since entrepreneurial alertness can be a key factor in firms' success and growth.

Moreover, the interest in this topic has fuelled research in many directions over the past two decades. In this case, the content analysis revealed five main research trends where entrepreneurial alertness is considered an element of the market process (2000-2004), a perceptual variable that influences an individual's decision to become an entrepreneur (2005-2008), a dynamic capability of both entrepreneurs and employees (2009-2011), a skill that can be developed through education (2012-2017), and a factor that influences a firm's performance and a source of competitive advantage (2018-2019). Therefore, over the years the research on entrepreneurial alertness has evolved from the focus on the individual to that of the company, and it is now recognized as a key factor of organizational success.

2.4.1. Future research avenues

Although there is a significant growth in the number of studies in the field of entrepreneurial alertness, more research is still needed to better understand how it can be formed and nurtured, as well as its relevance in the development of companies and non-profit organizations. Therefore,

through the analysis made it is possible to outline several suggestions for further research in the field of entrepreneurial alertness, namely through the development of studies aiming at:

- identifying what are the organizational antecedents affecting employees' entrepreneurial alertness (Urban, 2017), and how it can be enhanced in the context of an organization;
- understanding the role of entrepreneurial alertness in the context of social entrepreneurship (Mair & Noboa, 2006), and how it influences the performance and impact of social organizations;
- understanding the relevance of entrepreneurship and innovation ecosystems in the development of entrepreneurial alertness of individuals and organizations through providing empirical evidence about these relationships;
- understanding the role of entrepreneurship education in the development of entrepreneurial alertness, and which teaching methodologies and learning approaches better contribute to its development at the different education levels;
- assessing the differences between the characteristics of nascent and serial entrepreneurs, both at the behavioral and cognitive levels, related to alertness and the ability to spot opportunities (Craig & Johnson, 2006);
- understand which are the key factors affecting different levels of alertness among individuals (Sharma, 2019), and why some entrepreneurs are more successful than others;
- understanding how entrepreneurial alertness is related to other entrepreneurial competences, such as creativity, proactivity, empathy and the ability to deal with uncertainty and risk, among others (Bacigalupo et al., 2016), and how those competencies can influence the process of new venture creation;

Hence, future research is needed to uncover a clearer and more concise picture of the boundaries of the entrepreneurial alertness concept, and how it relates to other concepts in the field of entrepreneurship. Moreover, it also has relevant implications for practice and the promotion of social and economic development through the raise of entrepreneurship and new venture creation since entrepreneurial alertness is the spark of the entrepreneurial process. Thus, a better understanding of entrepreneurial alertness allows to define more adequately the initiatives and activities that foster this competence.

2.4.2. Limitations

There are some limitations to this research which should also be clearly stated. First, this study comprised only peer-reviewed articles that were published in English. Second, only the Scopus database was considered while ignoring other useful databases which might highlight the role of entrepreneurial alertness with other core concepts. Third, the subject areas of business management and accounting, economics, econometrics and finance, and social sciences were employed due to their greater relevance to the business domain. Finally, there may some bias related to the content analysis due to the personal view of each researcher.

Chapter III

Quantitative Analysis: Hypotheses Development and Testing

3 Quantitative Analysis: Hypotheses Development and Testing

3.1. Introduction

This study investigates how entrepreneurial alertness is related to other entrepreneurial competences and how those competences can influence the process of venture creation, which was highlighted in the previous chapter as a future research avenue in this field. More specifically, the study aims at understanding how prior knowledge, entrepreneurial alertness and entrepreneurial motivation shape opportunity recognition and entrepreneurial intentions and behaviour among university students. Also, and according to the previous chapter, the role of entrepreneurship education in the development of entrepreneurial competences will be also explored.

In the previous chapter it was discussed in detail the importance of entrepreneurial alertness towards opportunity recognition and how entrepreneurial intentions are developed, which ultimately leads to entrepreneurial actions. The main aim of this chapter is to develop a conceptual framework to test the relationship between entrepreneurial alertness and other related variables in opportunity recognition, and consequently, in entrepreneurial intention and behavior. This chapter is divided into two sections. First, the justification of hypotheses developed will be presented. Second, the proposed conceptual framework will be presented and discussed. The development of the hypotheses in this chapter is based on the students' context.

3.2. Hypotheses Development

3.2.1. Entrepreneurial Behavior as an Endogenous Variable

The study of personal behavior is a topic addressed in many research fields, from psychology to economics, and it has been addressed by the “Theory of Planned Behavior” (TPB) proposed by Ajzen (1991). The TPB is an extension of Theory of Reasoned Action (TRA) presented by Fishbein (1980). The TPB has been extensively used to explain and predict intentions and behavior in many research fields (Daniel & de Castro, 2017). According to Feola et al. (2019), the TPB is the most common model used to measure the individual's behavior. Behavior is considered a cognitive variable and has been studied in different fields including tourism (Juschten et al., 2019; Quintal et al., 2010), health sciences (Jalambadani et al., 2018; Niu et al., 2019), engineering (Chen & Yan, 2019), banking (Lee, 2009), etc. For example, Kautonen et al.

(2013) contribute to the entrepreneurial literature by using the TPB to predict entrepreneurial behavior.

Two models were empirically tested in the entrepreneurship field (Krueger et al., 2000; Krueger & Brazeal, 1994): the Entrepreneurial Event Model (EEM) presented by Shapero and Sokol's (1982), and the TPB. Both models illustrate how several factors influence an individual to behave in some/certain way. The EEM is conceptually similar to Ajzen's (1985, 1991) theory of planned behavior (TPB) (García et al., 2011). Nevertheless, unlike the TPB which aims at explaining planned behavior in general, the EEM was developed to explain specifically the entrepreneurial behavior (Krueger et al., 2000; F. Liñán, 2008).

Although many people have intentions to develop their own businesses, only a few manage to turn those intentions into real actions (Gelderen et al., 2015), and entrepreneurship is about actions instead of mere intentions (Kautonen et al., 2015) which means that without the actual behavior entrepreneurship is not substantiated.

3.2.2. Prior Knowledge and Opportunity Recognition

Many researchers have explored the impact of prior knowledge on opportunity recognition (e.g. Ardichvili et al., 2003; Baron, 2006; Marvel & Lumpkin, 2007; Shane, 2000). Veilleux et al. (2018) examined the relationship between prior knowledge and opportunity recognition among five start-ups and five high-growth technology firms in Canada which were specialized in photonics. They concluded that opportunity recognition is supported by the personal characteristics of the entrepreneurial teams. Similarly, Kraus et al. (2017) analyzed survey data from 623 firms active in international business with headquarters in Germany, Austria, Switzerland or Liechtenstein. The findings of the study suggested a strong relationship between prior international knowledge and international opportunity recognition.

In turn, Shane (2000) concluded that the three major dimensions of prior knowledge (prior knowledge of the market; prior knowledge of how to serve the customer; and prior knowledge of customer problems) could facilitate opportunity recognition among technology entrepreneurs. Likewise, the individual's understanding of the entrepreneurial process is influenced by prior knowledge of the market and existing products (Smith et al., 2019).

Moreover, Sigrist (1999) looked at the cognitive processes involved in opportunity recognition and postulated that there are two different types of knowledge in the opportunity identification process. First, the knowledge from the domain of special interest of entrepreneurs that arises

from the fascination and fun (domain 1). For such kind of knowledge, entrepreneurs spend a lot of time and effort to learn how to enhance their capabilities. Therefore, they gain profound knowledge in their special interest. Second, knowledge is accumulated from several years spent in the workplace (domain 2). The integration of these two domains leads to the discovery of opportunities (Ardichvili et al., 2003).

Furthermore, Fiet (2007) argues that no rapid substitute exists for prior knowledge due to the ephemeral nature of ideas leading to opportunity discovery, and therefore the entrepreneurs select consideration sets (a group of information channels) based on specific prior knowledge. So, a greater pool of prior knowledge facilitates opportunity recognition. Moreover, Arentz et al. (2013) explained that relevant prior knowledge along with specific cognitive characteristics, can lead to the identification of opportunities. Also, Ardichvili and Cardozo (2000) described prior knowledge as an essential component in opportunity recognition generated from job experience, non-work related experience, personal experience, and relevance of the business education. Likewise, both market knowledge and technological knowledge contribute to the firm recognition of entrepreneurial opportunities (Siegel & Renko, 2012).

Based on the above-discussed arguments, the following hypothesis is established:

H₁: Prior knowledge has a positive and significant impact on opportunity recognition among university students.

3.2.3. Prior Knowledge and Entrepreneurial Alertness

Many researchers have studied the impact of prior knowledge on entrepreneurial alertness (Arentz et al., 2013; Li et al., 2015; Tang et al., 2012). For example, Arentz et al. (2013) have studied the role of prior knowledge in the identification of opportunities in a controlled, computerized laboratory setting, employing 64 students from George Mason University. Their purpose was to analyze whether the entrepreneur's ability to recognize her/his prior knowledge would influence opportunity during the experiment or not. They concluded that those students who had acquired prior knowledge through propitious treatment reflected more orientation towards the opportunity within the experiment.

In another research, Park et al. (2017) collected data from 177 respondents consisting of CEOs and team leaders of entrepreneurial firms under five years of age, from business incubations centres. The authors concluded that prior knowledge positively impacts the entrepreneurial alertness among entrepreneurs.

Nevertheless, due to the different levels of prior knowledge, entrepreneurs are not all equally alert to find the same level of opportunities. As previously noted, Kirzner (1979) defined alertness as the ability to spot the profitable opportunities that have been overlooked. In connection to alertness, Arentz et al. (2013) studied the influence of alertness in both entrepreneurship and market process. Moreover, according to Kirzner (1979), the information pool is the basis of entrepreneurial alertness. The first phase of entrepreneurial alertness (i.e. information search) is associated with prior knowledge (Tang et al., 2012). Prior knowledge affects an individual's alertness and explains why some entrepreneurs find potential opportunities while others do not.

The literature points out that prior knowledge is an important predictor of entrepreneurial alertness; thus, the above discussion leads to propose the following hypothesis:

H₂: Prior knowledge has a positive and significant impact on entrepreneurial alertness among university students.

3.2.4. Entrepreneurial Alertness and Opportunity Recognition

According to Kirzner (1979, p. 48), entrepreneurial alertness refers to the “ability to notice without search opportunities that have hitherto been overlooked”. In addition, alertness is “the degree to which decision-makers sense and anticipate entrepreneurial opportunities associated with the current and future states of their business environment [and] is part of a key mechanism through which entrepreneurial opportunities are recognized, constructed, and acted upon” (Roundy et al., 2018). Both definitions presented above focus on involving opportunity recognition in the state of entrepreneurial alertness. Therefore, entrepreneurial alertness is considered necessary for the success of opportunity recognition (Ardichvili et al., 2003).

Several authors (e.g. Ardichvili et al., 2003; Baron, 2006; Tang et al., 2012) have studied the role of entrepreneurial alertness in the process of opportunity recognition. For example, Zanella et al. (2019) demonstrated a positive relationship of the individual alertness and opportunity identification, mediated by firms' strategic posture through surveying 276 managers and founders of small and medium enterprises (SMEs) located in Mexico. Similarly, Hajizadeh and Zali (2016) conducted research on 64 nanotechnology firms located in Tehran, Iran. The authors concluded that entrepreneurial alertness has a positive impact on opportunity recognition. In the same vein, Fischer (2011) studied the PricewaterhouseCoopers AG (PwC) case study, one of the

biggest accounting and consulting firms. The author interviewed 70 employees over three years and found a positive relationship between entrepreneurial alertness and opportunity recognition. Furthermore, the ability to act upon an entrepreneurial opportunity is a major driver of new venture performance (Adomako et al., 2018). In a systematic literature review, Sharma (2019) argues that entrepreneurial alertness is the key factor in the process of opportunity identification. Moreover, entrepreneurial alertness has a significant role on strategic change decisions and organizational performance (Roundy et al., 2018).

In sum, entrepreneurial alertness is relevant for entrepreneurs to acquire (scan and search), organize (associate and connect), and interpret (evaluate and judge) the information needed to recognize new opportunities (Tang et al., 2012). Thus, entrepreneurially alert people are more likely to recognize a profitable opportunity (Boudreaux et al., 2019).

In a research study on Chinese students, Li et al. (2015) observe a strong relationship between alertness and prior knowledge on opportunity recognition. Moreover, Lim et al. (2014) conducted a research in Kuala Lumpur and concluded that entrepreneurial alertness mediate the relationship between prior knowledge and intention. In the same vein, Ma and Huang (2016) researched 500 Chinese electrical and electronic firms and concluded that market and technical knowledge acquisition of the firms has positive effects on entrepreneurial alertness to opportunity recognition. Nevertheless, in a research of Hajizadeh and Zali (2016), entrepreneurial alertness has a positive and significant effect on opportunity recognition. Therefore, opportunity recognition is also influenced by prior knowledge.

Thus, based on the above-discussed arguments on entrepreneurial alertness and opportunity recognition, the following hypotheses are established:

H₃: Entrepreneurial alertness has a positive and significant impact on opportunity recognition among university students.

H_{3a}: Entrepreneurial alertness mediates the relationship between prior knowledge and opportunity recognition

3.2.5. Entrepreneurial Alertness and Entrepreneurial Motivation

Kirzner (1985, p. 56) defined alertness as “a motivated propensity of man to formulate an image of the future”. The motivated propensity is explained as energization and direction of the behavior of individuals which moves towards the desired stimulus. According to Santos and García (2011), entrepreneurs’ motivational orientation in the case of international opportunities

changes as they gain experience, which at the same time changes their alertness and their informational concerns. Furthermore, Santos and García (2011) also observed that entrepreneurs displaying a range of different motivations evidence distinct states of alertness. There is, therefore, a strong concomitance between entrepreneurial alertness and motivation.

Obschonka et al. (2017) studied the role of personality characteristics and age-appropriate entrepreneurial competencies (leadership, self-esteem, creativity, and proactivity motivation) in the prediction of entrepreneurial alertness and career intention by surveying 523 students from high schools in Helsinki, Finland. They concluded that the effects of personality on alertness was mediated by leadership and proactivity motivation. They also concluded that highly motivated students who emphasize their academic achievement might not develop a strong entrepreneurial motivation. Their results also showed that after controlling for the effect of personality and/or competence factors, entrepreneurial alertness and intention are independent career development constructs.

Similarly, Tang (2009) investigated the individual's and environmental factors shaping entrepreneurial alertness using a sample of 365 nascent entrepreneurs located in the United States, using data from the Panel Study of Entrepreneurial Dynamics (PSED). This author found a positive relationship between achievement motivation and entrepreneurial alertness in nascent entrepreneurs when focusing on job promotion. According to the regulatory focus theory, focus on promotion may serve as a strong motivation for entrepreneurs to stay alert to market opportunities. The positive correlation between entrepreneurial alertness and entrepreneurial motivation leads to the following hypotheses:

H4: Entrepreneurial alertness has a positive and significant impact on entrepreneurial motivation among university students.

3.2.6. Entrepreneurial Motivation and Opportunity Recognition

Aldrich and Zimmer (1986, p. 3) suggest that entrepreneurial activity “can be conceptualized as a function of opportunity structures and motivated entrepreneurs with access to resources”. The study of personal motivations has also received attention from researchers due to its impact on entrepreneurship, including opportunity identification and new venture formation (Ruven & Leonie, 2018), since developing entrepreneurship theory requires consideration of a person's motivation when making entrepreneurial decisions, as well as how differences in motivations influence the entrepreneurial process (Shane et al., 2003). For example, variations in the

perception of risk and opportunity across people influence their decision to start a new venture (Shane & Venkataraman, 2000a). In this case, even if personal motivation is caused by several factors, it ultimately comes from either inside one's self (high emotional feelings when launching new firms) or one's external environment (admiration of society or money received from ventures). Therefore, motivation can be referred to as intrinsic or extrinsic (Carsrud et al., 2017). Intrinsic motivation refers to the personal interests of entrepreneurs in a task (Carsrud et al., 2017) that leads to satisfaction, while extrinsic motivation triggers behaviors that are performed to gain rewards or avoid negative consequences. Thus, intrinsic motivation underlies those behaviors that are performed solely on the basis of personal interest and satisfaction (Ryan & Deci, 2000). However, intrinsic and extrinsic motivations are not mutually exclusive and an individual can be motivated by both (intrinsic and extrinsic) in any entrepreneurial activity (Elfving, 2009).

Business-oriented entrepreneurs strive for benefits such as money, power, prestige, and/or position. However, these cannot be considered as the only possible motives. For instance, recent insights that other incentives may be involved in creating a venture have been highlighted in the field of social entrepreneurship. Here, social gains, rather than financial gains, are considered the main motivational factor. Therefore, the main motivator for opportunistic entrepreneurs may be the desire for achievement or success (as measured economically) without thinking about whether their actions are right or wrong, while another group of entrepreneurs are usually motivated by the so-called survival-oriented motivations (Carsrud & Brännback, 2011).

Entrepreneurial motivation was found to have a significant influence on entrepreneurial "passion" which is later used to explain entrepreneurial success (Husin et al., 2016) as it is a cornerstone for the entrepreneurial process (Murnieks et al., 2019). Moreover, Murnieks et al. (2019) stated that, although research on entrepreneurial motivation has developed rapidly, it has grown in different theoretical silos that tend to isolate reasons based on different phases of business development (e.g., initiation, growth, and exit) rather than to realize that an individual often go through all these stages and often goes through various forms of motivation throughout the entrepreneurial journey.

Aldrich and Zimmer (1986, p. 14) argue that "opportunities are irrelevant unless taken advantage of, and people vary widely in their ability to seize opportunities". In the same vein, Shane et al. (2003, p. 271) note that "people also differ widely in their motivation to seize opportunities".

Therefore, entrepreneurial motivation is fostered by *push* and *pull* factors (Wilson et al., 2007), which is related to the necessity or opportunity driven entrepreneurship (Williams & Round, 2009). Therefore, knowing what motivates people to pursue an opportunity is of prime importance to foster entrepreneurial behavior (Carsrud et al., 2017).

Furthermore, Santos and García (2011) conducted a study on entrepreneurs of the Spanish natural stone sector and found that emergence of opportunity and entrepreneurs' motivation are closely related with each other. Therefore, the rise of opportunity is based on deliberate actions of entrepreneurs (Krueger, 2000; Sarason et al., 2006). Santos and García (2011) also concluded that entrepreneurs' motivation changes with respect to international opportunity which at the same time impacts the entrepreneurs' alertness. Thus, alertness is entrepreneurs scanning, guided by motivation in recognizing the opportunity.

To analyze whether entrepreneurial motivation drives Portuguese students to recognize opportunity, the following hypotheses are proposed:

H₅: Entrepreneurial motivation has a positive and significant impact on opportunity recognition among university students.

H_{5a}: Entrepreneurial motivation mediates the relationship between entrepreneurial alertness and opportunity recognition.

3.2.7. Entrepreneurial Motivation and Entrepreneurial Intention

Motivation is very valuable in the real world because it influences the development of an action. Therefore, mobilizing/motivating people to act is one of the main concerns of managers and teachers (Ryan & Deci, 2000). Entrepreneurial motivation can be described as reasons or the drivers for a person to start a new business (Hessels et al., 2008). Entrepreneurial motivation can influence the willingness of individuals to act accordingly in an entrepreneurial way (Shepherd & Patzelt, 2018a).

For instance, Tung et al. (2020) conducted research intending to analyze the relationship between start-ups and determinants of entrepreneurial intentions among five universities located in Vietnam and the Philippines. They collected the data from 819 students enrolled in the fourth year. These researchers found a positive relationship between entrepreneurial motivation (measured as self-motivation for entrepreneurship) and perceived feasibility, which is an antecedent of entrepreneurial intention. In this case, perceived feasibility is the perception of how difficult or easy it is to engage in the actual behavior of creating a start-up. Similarly,

Purwana and Suhud (2018) investigated the impact of entrepreneurial motivation on entrepreneurial intention. They collected data from 626 vocational school students in Jakarta. The findings of the study demonstrated that entrepreneurial motivation has a positive impact on entrepreneurial intention among the students.

Moreover, Solesvik (2013) explained that entrepreneurial motivation is highlighted as key cognitive measures to predict one's entrepreneurial intentions in the literature of entrepreneurship over time. The author also explained that entrepreneurial motivation seems to be higher in people who are more willing to participate in enterprise programs and, as a result, they are more likely to become entrepreneurs. As documented, the relationship between perceived entrepreneurial motivation and entrepreneurial intentions can be mediated by attitudes, subjective norms, and control of perceived behavior (Solesvik, 2013). Entrepreneurial motivation shapes the individual and the environmental context, and it needs to be better understood in relation to entrepreneurial intentions (Carsrud et al., 2017).

Therefore, the present study examines the impact of entrepreneurial motivation on entrepreneurial intention that could lead to developing entrepreneurial behavior among high education students. Based on it, the following hypothesis is proposed:

H₆: Entrepreneurial motivation has a positive and significant impact on entrepreneurial intentions among university students.

3.2.8. Opportunity Recognition and Entrepreneurial Intention

The successful opportunity recognition may lead to the creation of a successful venture (Ardichvili et al., 2003). Cognitive psychologists divide the process of opportunity recognition into two perspectives, named “feature analysis model” and “pattern recognition model” (Li et al., 2015). In the feature analysis model, according to Li et al. (2015), the focus is a feature of the opportunity with an emphasis on the importance of knowledge and experience in opportunity identification. In turn, the cognitive framework consists of the models of pattern recognition, in which prototype, schema, and exemplar are integrated into a single cognitive framework (Acs & Audretsch, 2010). In the beginning, the ability of individuals to recognize opportunities depends upon the prototype or schema (Li et al., 2015), and, as they gain experience and knowledge, the more able they become in identifying patterns (Baron, 2006). Hence, opportunity recognition has been accepted as a key factor in the entrepreneurial process and a crucial factor that drives the other phases of new venture creation (Ozgen & Baron, 2007).

Several authors have explored the relationship between opportunity recognition and entrepreneurial intention. For example, Hassan et al. (2020) studied the impact of opportunity recognition on entrepreneurial intention by surveying 334 Indian students with a business and management background. They concluded that opportunity recognition shows a significant positive impact on the entrepreneurial intention of students. Similarly, Ryu and Kim (2020) investigate the relationship between opportunity recognition and entrepreneurial intention at a national level. They used the data from 15 countries included in the Global Entrepreneurship Monitoring (GEM), the Gender Gap Index (GGI) of the World Economic Forum (WEF) for this analysis. The authors found that opportunity recognition positively affect entrepreneurial intention.

In the same vein, Botha and Taljaard (2019) collected a sample of 342 nascent and existing entrepreneurs from South Africa. The purpose of the study was to investigate whether various individual's entrepreneurial competencies and entrepreneurial intention influence each other. The authors observed a strong positive relationship between opportunity recognition and entrepreneurial intention. In another study, Wannamakok and Chang (2020) collected a sample of 9716 women participating in the Global Entrepreneurship Monitoring (GEM) survey. The data from the survey was examined using regression analysis. The authors found that opportunity recognition has a significant and positive influence on women entrepreneurial intention. Therefore, the decision about a new venture initiative would be taken after detecting a viable business opportunity (Francisco Liñán, 2007).

Indeed, entrepreneurial act and the creation of a new business implies the occurrence of two events simultaneously: one is the presence of a proper entrepreneurial opportunity and the other is the presence of a person who has enough ability and willingness to take advantage of that opportunity (Krueger & Brazeal, 1994). When these events overlap, the entrepreneurial behavior may take place, and thus, a new enterprise can be created (Karimi et al., 2014). In other words, the perception of potential opportunity stimulates the entrepreneurial intentions of an entrepreneur to create a new venture. Edelman and Yli-Renko (2010) found a significant relationship between entrepreneurial perception of market opportunity and entrepreneurs' efforts in formation of new venture and, in turn, these efforts were also significantly related to start up a venture.

Furthermore, Kah et al. (2020) interviewed 20 entrepreneurs in Gambia and concluded that entrepreneurs are motivated by opportunity recognition. In another study, Rametse et al. (2018) collected data from 157 immigrant entrepreneurs and found that those entrepreneurs who have a high level of motivation report a high level of opportunity recognition capability. Nevertheless, opportunity recognition is very important in advocating one's intention to become an entrepreneur (Nikraftar & Hosseini, 2016). Therefore, the individual's entrepreneurial intention is also influenced by entrepreneurial motivation.

From these findings, the notion is that the students who have more capacity to recognize an opportunity possess more intention to start a new business. Accordingly, this study formulates the following hypotheses:

H₇: Opportunity recognition has a positive and significant impact on entrepreneurial intentions among university students.

H_{7a}: Opportunity recognition mediates the relationship between entrepreneurial motivation and entrepreneurial intention

3.2.9. Entrepreneurial Intentions and Entrepreneurial Behavior

Entrepreneurial intention is considered as the readiness of individuals to engage in entrepreneurial behavior aiming at creating a new business (Neneh, 2019). Shirokova et al. (2016) found that there is a significant positive association between entrepreneurial intentions and the scope of start-up activities in which the student entrepreneurs are engaged in. Moreover, this association is reinforced by a set of factors, such as entrepreneur's family entrepreneurial background, age, gender (link for males is stronger), and university entrepreneurial environment. So, further strengthening the entrepreneurial intention resulted in more engagement of the entrepreneurs towards the entrepreneurial behavior (Gelderen et al., 2015) which predicts the willingness of individuals to invest more efforts in the business processes and activities.

Similarly, Shinnar et al. (2018) performed a research work to predict the impact of intention on behavior by using 179 students' data collected in four different waves (T1-T4) from a public university in the south-eastern United State. They found a positive relationship between entrepreneurial intentions and entrepreneurial behavior among the students, and that this link is moderated by individuals' gender. In this case, women are less likely to act on their entrepreneurial intentions.

Also, Gelderen et al. (2008) focused on the prediction of entrepreneurial intention, having found that the two most important variables to explain entrepreneurial intentions are entrepreneurial alertness and the importance attached to financial security.

Thus, these studies indicate that entrepreneurial intention defines the entrepreneurial behavior of the entrepreneurs and the amount of effort they are willing to invest in start-up activities, and that it is also essential to understand the intentional factors which influence the students to launch a new start-up (Ambad & Damit, 2016).

Based on these arguments, entrepreneurial intention is an essential predictor of entrepreneurial behavior to start a new venture. Thus, the following hypothesis is formulated:

H₈: Entrepreneurial intention has a positive and significant impact on entrepreneurial behavior among university students.

3.3. Development of the Conceptual Model

The proposed conceptual model is illustrated in Figure 3. 1., representing the hypotheses previously developed. The conceptual framework presents the following relationships:

1) The relationship between prior knowledge and opportunity recognition; 2) The relationship between prior knowledge and entrepreneurial alertness; 3) The relationship between entrepreneurial alertness and opportunity recognition; 3a) Entrepreneurial alertness mediates the relationship between prior knowledge and opportunity recognition; 4) The relationship between entrepreneurial alertness and entrepreneurial motivation; 5) The relationship between entrepreneurial motivation and opportunity recognition; 5a) Entrepreneurial motivation mediates the relationship between entrepreneurial alertness and opportunity recognition; 6) The relationship between entrepreneurial motivation and entrepreneurial intention; 7) The relationship between opportunity recognition and entrepreneurial intention; 7a) Opportunity recognition mediates the relationship between entrepreneurial motivation and entrepreneurial intention; 8) The relationship between entrepreneurial intention and entrepreneurial behavior.

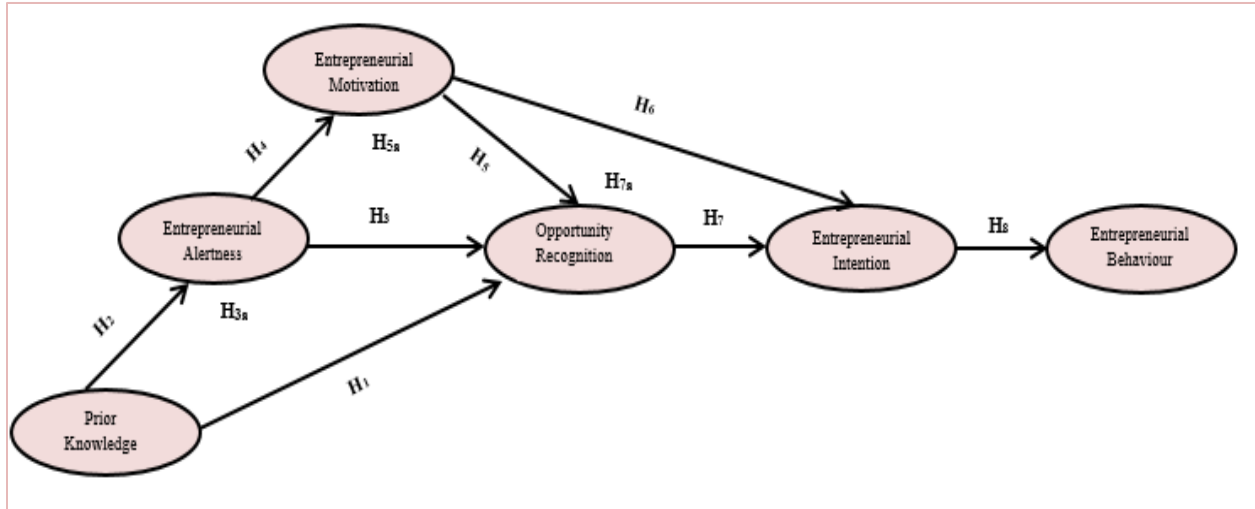


Figure 3. 1: Conceptual framework

3.4. Research Methodology

This section explains the approach followed in the present chapter, the justification of the methods used and the hypotheses of the study.

3.4.1. Research Design

Scientific research is viewed as a systematic process to find new facts and relevant information. The research design provides the data collection framework (Schwab, 2005). The research design is also a combination of the research strategy and research settings with important implications to validate the study (Stone-Romero, 2004). Moreover, research design explains the research topic, time horizons, sampling designs and variable measurements (Creswell, 2009).

The research onion developed by Saunders, Lewis, and Thornhill (Saunders et al., 2008) explains the strategies that must be considered in setting the research strategy. Each layer of the research onion, shown in Figure 3. 1., details the research process as a subpart in designing the research methodology. The different layers of the onion are as follow: research philosophy; research approach; research strategy; research choice; time horizon; and data collection techniques.

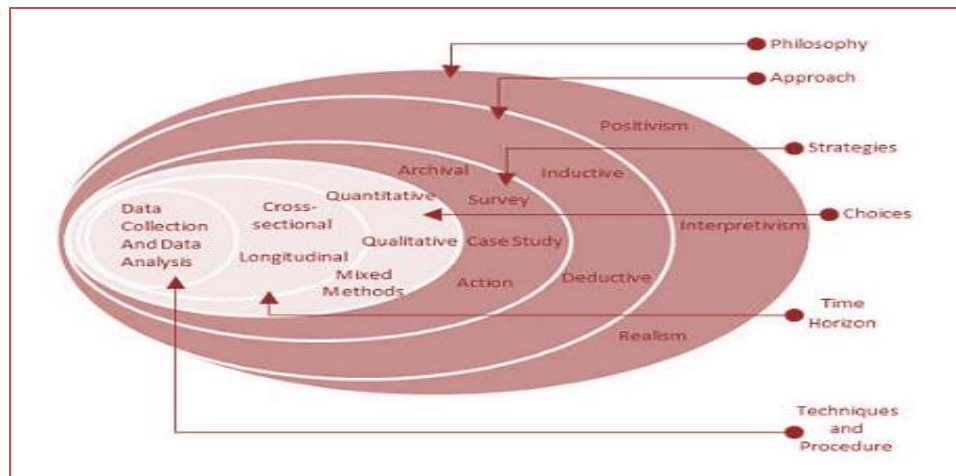


Figure 3.2. *Research Onion*
 Source: Saunders et al. (Saunders et al., 2008)

3.4.1.1. Philosophical Approach

According to Saunders et al. (2008), the system of beliefs and the development of assumptions regarding knowledge could be referred to as research philosophy. It is an essential obligation of the researcher to gain a deep insight from the ontological (nature) and epistemological (way of gaining knowledge) viewpoints. Creswell (2009) refers to these as “basic sets of beliefs that guide actions”. The research paradigms differ based on ontological beliefs and epistemological assumptions. Ontology, according to Blaikie (2007, p. 13) refers to answer the question ‘what is the nature of social reality?’. The major issue is to understand whether social entities are built on objective base (realism) or considered as social constructions based on perceptions (idealism) (Bryman, 2012). The constructionists (subjectivists) advocate that only thoughts exist instead of an external world which design the reality, and due to different thoughts, the reality is different for everyone. In turn, the objectivists believe in the existence of the external world which is entirely independent of human activities. Blaikie (2007, p. 18) explained the epistemology to answer the question ‘How can social reality be known?’. Bryman (2012) divided the epistemology into two subsections named as positivism and interpretivism. Positivists are those who believe in data collection, and have insight into symmetries and casual relationships in the collected data to make it more generalizable (Gill & Johnson, 2010).

On the other hand, interpretivism believes that human beings/actors cannot be treated as research objects. They argue that the researcher’s own beliefs and views can systemize the process of interpretation. Different beliefs regarding ontology and epistemology are required in different

research paradigms. Saunders et al. (2008) summarize these two extreme perspectives as shown in Table 3. 1. below.

Table 3. 1: Two extreme philosophies in research, adapted from (Saunders et al., 2008)

	Positivism	Interpretivism
Ontology	External, objective and independent of social actors	Socially constructed, subjective
Epistemology	Only observable phenomenon can produce credible facts; focus on causality and law-like generalisations, reducing phenomenon to simplest elements	Subjective meanings and social phenomena; focus upon the details of the situation, a reality behind the details, subjective meanings motivating actions
Axiology (researcher's view of the role of values in research)	Research is undertaken in a value-free way; the researcher is independent of the data and mechanisms, and maintains an objective stance	Research is value-bound; the researcher is part of what is being researched; cannot be separated and will be subjective
Data collection techniques often used	Highly structured, large samples, measurement, quantitative but can be qualitative	Small samples, in-depth investigations, qualitative

According to Blaikie (2007), and Cassell and Symon (2004), the researcher should follow the methodology according to the nature of the project itself or the researcher's beliefs related to the world. Furthermore, Creswell (2009) indicate that the researcher's experience and the target audience also have an impact on the research approach decision. Credible research philosophy is twofold: logical research assumptions and well-constructed thoughts.

The research philosophy is of paramount importance in business studies as it defines the research strategy and guides the researchers in selecting the appropriate research methodology, data collection procedures, and analysis' techniques (Saunders et al., 2008). The differences between different approaches are shown in Table 3. 1.

A positivist research approach is deductive in nature, uses a quantitative research approach based on large sample sizes, the ontology is external and objective, and its axiology is value-free. This is the philosophical approach followed in the present study, whereby hypotheses are developed, large sample data is collected, and quantitative techniques are used to analyze the relationship between the variables.

3.4.1.2. Research Approach

The inductive research approach is designed from “the more specific” to “the more general”, often referred to as the “bottom-up” approach. It starts with observation, detects some patterns, formulates some hypothesis and finally ends up with theory development.

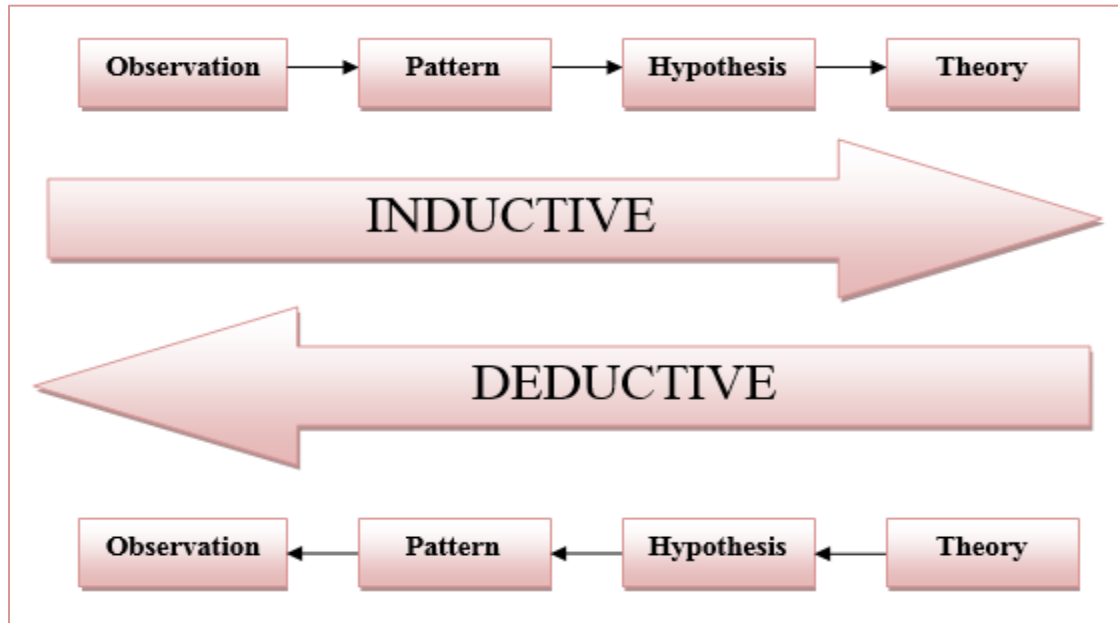


Figure 3. 3: Inductive and Deductive approaches

The deductive approach is designed in a different way: it moves from broader generalization to more specificities. Informally, it is called a “top-down” approach. In this approach, the researcher starts with a theory regarding a particular topic of interest. Thereafter, researchers develop a hypothesis on a specific problem which they want to test. After examining the hypothesis, it ultimately supports the original theory or not. Figure 3. 3 shows the difference between the inductive and the deductive approaches. The current study adopts a combination of both approaches. In the first portion of the study, the inductive approach was used while conducting a systematic literature review on entrepreneurial alertness to find gaps in the literature. The systematic literature review (and the gaps found in the literature) helped in developing the conceptual model. In the second portion of the study, the deductive approach was applied to test the theoretically formulated conceptual model through data collection from a purposely designed questionnaire.

3.4.1.3. Research Strategy

The researcher's strategy aims at helping the researcher to solve the research problems in a systematic way (Saunders et al., 2008). There are several research strategies, including survey research, case study, ground theory, experimental study, ethnography research, observational study, etc. A researcher may choose any of the research strategies that best address the research problem. This study employed survey research through a close-ended questionnaire.

However, survey research through a questionnaire can lead to a low response rate which can cause biases and issues of generalizability. To overcome the problem of generalizability and biases, the questionnaire is made short, explained the purpose of the study to the respondent and a reminder call to fill the questionnaire. After gathering the data, it is analyzed through descriptive and inferential statistics (Saunders et al., 2008). These steps were followed, and the respondents' privacy was fully protected by keeping the information entirely confidential.

3.4.1.4. Research Choices

Considering the research questions and objectives of the study, a quantitative approach was used to examine the causal relationship between the constructs. However, a qualitative study was previously conducted in a systematic literature review to consider which individual's characteristics affect entrepreneurial behavior.

According to Creswell (1998), qualitative research can be defined as “an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of the informants and conducting in natural setting”. Statistical tools are typically not used in this kind of research, which tends to collect a large amount of information from a relatively small number of observational units. This type of research mostly addresses the question “Why”, and describes the phenomena. In general, qualitative research is not transformed into the numeric form, having flexibility as its main advantage.

Creswell (1998) also defines the quantitative research as “an inquiry into social and human problems based on testing a theory composed on the variable, measures with numbers and analyzed with statistical procedures, in order to determine whether the predictive generalization of the theory hold true”. This definition points us to the collection of data from a large number of observational units, the use of figures and graphs to summarize the information, and the

application of inferential statistical methods to examine the causal relationships between variables.

Table 3. 2. presents the difference between quantitative and qualitative approaches.

Table 3. 2: Difference between Qualitative and Quantitative techniques (Ranjit, 2005)

Difference	Qualitative	Quantitative
Underpinning Philosophy	Empiricism: “The only knowledge that human beings acquire is from sensory experiences” (Bernard 1994: 2)	Rationalism: “That human beings achieve knowledge because of their capacity to reason” (Bernard 1994:2)
Approach to Inquiry	Unstructured	Structured
Investigation Objective	To define variation in an event, situation, issue, etc.	To describe an extent of variation in an event situation, issue, etc.
Variables Measurement	Stressing on the description of variables	Stressing on some structures of either measurement or classification of variables.
Sample Size	Limited Cases	Emphasis on greater sample size.
Focus of Inquiry	Checks multiple problems but accumulate necessary information from fewer respondents.	Narrows focus on the expression of the extent of inquiry but accumulate necessary information from a greater number of respondents.
Main Research Value	Validity but does not state to be value-free.	Value-free in terms of Reliability and objectivity.
Main Research Topic	Investigate experiences, feelings, perceptions, expressions and meanings.	Describes pervasiveness, occurrence, and extent nature of subjects, views and attitude; finds out regularities and prepares theories.
Data Analysis	Subjects answers, descriptions or study data to the identification of themes and illustrates them.	Subjects variables to frequency distributions, cross-tabulations or other statistical methods.
Communication	Organization more descriptive and narrative in nature.	Organization more systematic in nature, drawing deductions and conclusions, and testing degree and potency of a relationship.

3.4.1.5. Time Horizons

The most common types of data collection used in quantitative research are the cross-sectional, time-series, and longitudinal formats. A cross-sectional study involves the collection of data at one point in time, while a time-series study involves the collection of data on variables over time, and a longitudinal study involves the collection of data varying across both time and cross-sectional units (Saunders et al., 2008). The present study is cross-sectional in that the data was collected at one point in time. The data was collected through the survey method which, despite its known difficulties concerning the time and resources required to reach out to the maximum number of participants as possible (Bryman & Cramer, 2005), tends to be the most commonly used method for a cross-sectional study in the social sciences.

3.4.2. Quantitative Study

Being a cross-sectional and survey-based study, the quantitative technique is employed to explore the causal relationship among prior knowledge, entrepreneurial alertness, entrepreneurial motivation, opportunity recognition, entrepreneurial intention, and entrepreneurial behavior. Saunders et al. (2008) demonstrated that survey-based, self-administrated questionnaires are commonly used for data collection in the field of business and management.

3.4.2.1. Measurement Scales

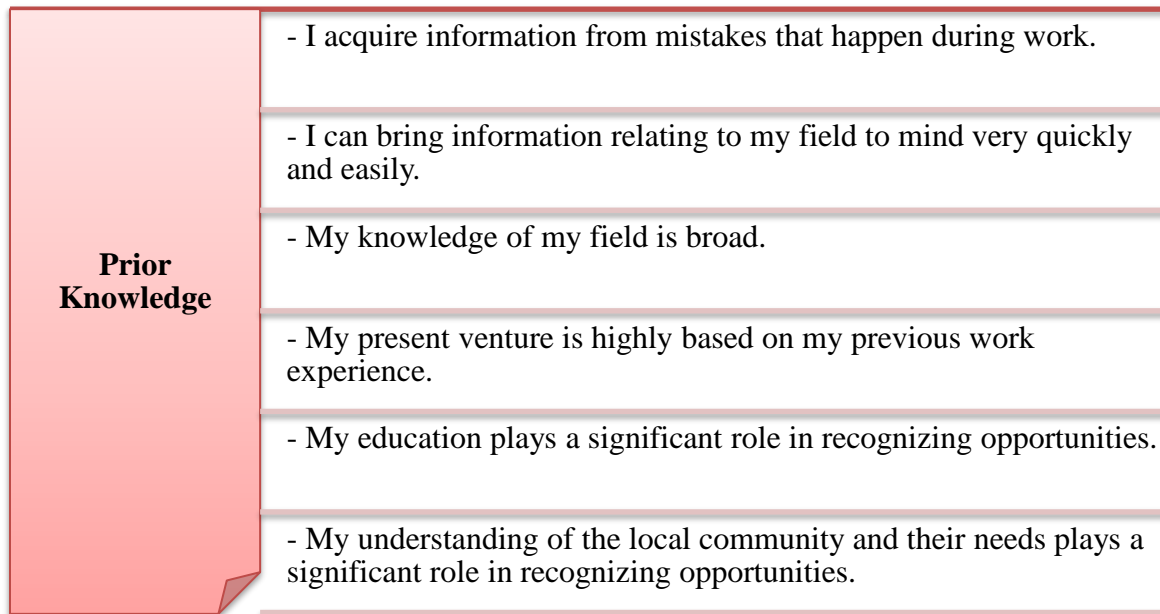
Generally, the constructs are measured either by using already existing, published and validated scales or by creating new scales. The use of existing and validated scales is highly recommended due to its significant contribution to scientific knowledge in a specific field (Straub & Gefen, 2004).

So, based on the above recommendation, existing and validated scales of prior knowledge, entrepreneurial alertness, entrepreneurial motivation, opportunity recognition, entrepreneurial intention, and entrepreneurial behavior were employed in this study. Prior to developing the quantitative questionnaire, all scales were translated into the Portuguese language.

3.4.2.1.1. PK measurement scale

Several scales regarding prior knowledge exist in the literature. However, the most relevant scales are presented by Marvel and Lumpkin (2007) with a reliability of 0.84, and Ozgen (2003) with a reliability of 0.71.

The scale developed by Marvel and Lumpkin (2007) deals with the employees or the entrepreneurs at the firm level. This 15 items scale pertains to the market condition, customers' usage of the products and services, and other firms-oriented items. Since one of the items in this scale is “*My knowledge of suppliers in the primary market of my forthcoming business*”, it does not properly fit within the context of the current study. Therefore, the scale developed by Ozgen (2003), which is aligned with the context has been employed in the current study.



*Figure 3. 4: Items of prior knowledge scale
Source: adapted from Ozgen (2003)*

The used scale of prior knowledge is composed of six items. The five-point Likert scale ranging from 1 “Strongly disagree” to 5 “Strongly agree” has been used to document the response of the respondents to the statements presented in Figure 3. 4.

3.4.2.1.2. EA measurement scale

The most widely used scale for entrepreneurial alertness with thirteen items was developed by Tang et al. (2012), having a Cronbach’s alpha of 0.88. This scale consists of three sub-parts labelled as “Scanning and search” with six items, “Association and connection” with three items, and “Evaluation and judgment” with four items. Due to its high validity, the current study used the entrepreneurial alertness scale developed by Tang et al. (2012) to explore the causal relationships proposed in the hypothetical model.

Entrepreneurial alertness

Scanning and search	<ul style="list-style-type: none">- I have frequent interactions with others to acquire new information.- I always keep an eye out for new business ideas when looking for information.- I read news, magazines, or trade publications regularly to acquire new informations.- I browse the internet every day.- I am an avid information seeker.- I am always actively looking for new information.
Association and connection	<ul style="list-style-type: none">- I see links between seeming unrelated piece of information.- I am good at connecting dots.- I often see connections between previously unconnected domains of information.
Evaluation and judgement	<ul style="list-style-type: none">- I have a gut feeling for potential information.- I can distinguish between profitable opportunities and not-so-profitable opportunities.- I have a knack for telling high-values opportunities apart from the low-value opportunities.- When facing multiple opportunities, I am able to select the good ones.

Figure 3. 5: Dimensions and items of entrepreneurial alertness
Source: Tang et al. (2012)

The employed scale of prior knowledge is composed of three dimensions with thirteen items. The responses of the respondents were documented by using a seven-point Likert scale ranging from 1 “Strongly disagree” to 7 “Strongly agree” as presented in Figure 3. 5.

3.4.2.1.3. EM measurement scale

Several authors attempted to develop the scale of entrepreneurial motivation. However, this study employed the scale developed by Almobaireek and Manolova (2013) with eleven items and Cronbach’s alpha with a value of 0.82. This scale covers a wide range of motives, such as financial gains, independency, self-achievement, and achievement of vision, etc.

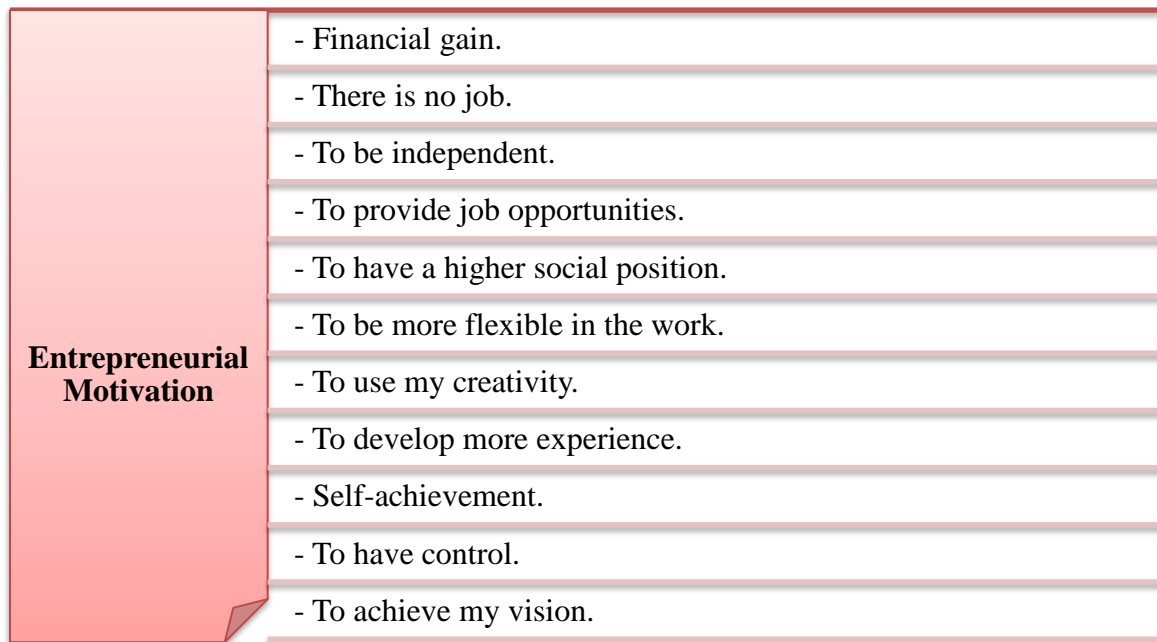


Figure 3. 6: Items of entrepreneurial motivation
Source: Almobaireek and Manolova (2013)

The responses of the respondents were documented by using a seven-point Likert scale ranging from 1 “Strongly disagree” to 7 “Strongly agree” as presented in Figure 3. 6.

3.4.2.1.4. OR measurement scale

Opportunity recognition is a generic term used in almost every field of research. Several scales regarding opportunity recognition exist in the literature. Nevertheless, the scale of opportunity recognition developed by Ozgen and Baron (2007) is most appropriate given the context of the current study.

Opportunity Recognition	- While going about routine day to day activities, I see potential new venture ideas all around me.
	- I have special “alertness” or sensitivity toward new venture opportunities.
	- “Seeing” potential new venture opportunities do not come very naturally to me.
	- I frequently identify the ideas that can be converted into new products and services.
	- I generally lack ideas that may materialize into profitable enterprise.
	- I frequently identify the opportunities to start up new business.

Figure 3. 7: Items of opportunity recognition
Source: Ozgen and Baron (2007)

This scale is more general rather than specific to a particular field of study. Therefore, the current study used the scale developed by Ozgen and Baron (2007) with six items.

The responses of the respondents were documented by using five-point Likert scale ranging from 1 “Strongly disagree” to 5 “Strongly agree” as presented in Figure 3. 7.

3.4.2.1.5. EI measurement scale

Despite the existence of several entrepreneurial intention scales, the present study used the scale developed by Linan and Chen (2009). It is a six items’ scale with a Cronbach’s alpha value of 0.92.

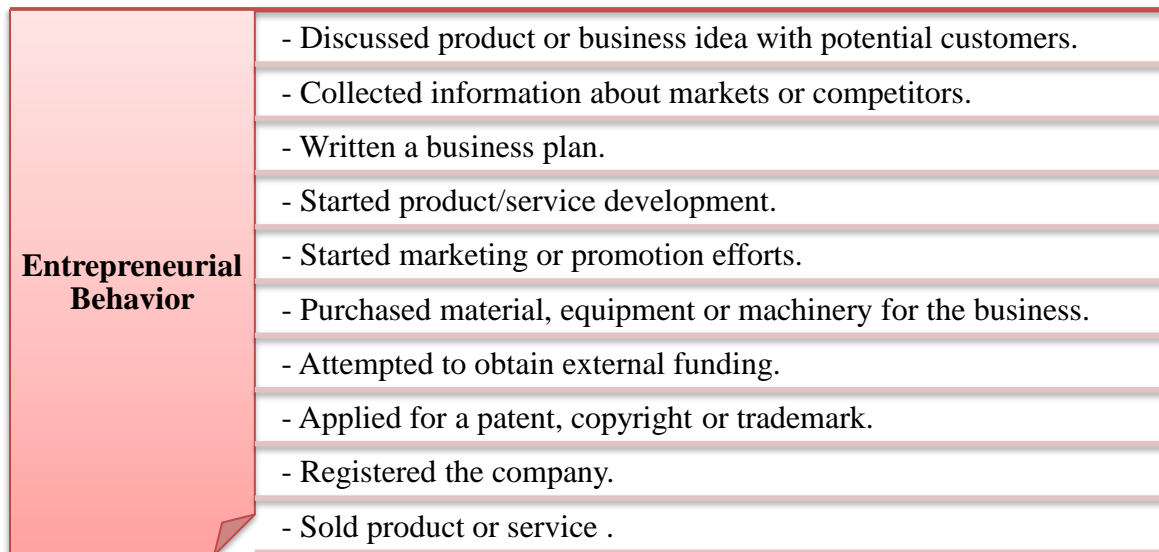
Entrepreneurial Intention	- I am ready to do anything to be an entrepreneur.
	- My professional goal is to become an entrepreneur.
	- I am determined to create a business venture in the future.
	- I have very seriously thought about starting a firm.
	- I have got the intention to start a firm one day.
	- I intend to start a firm within 5 years of graduation.

Figure 3. 8: Items of entrepreneurial intentions
Source: Linan and Chen (2009)

This scale is based on the measure of pure-intention (“I intend to”) instead of desires (“I want to....”), self-prediction (“How likely it is....”) and interest measures (“How interested you are in....”). The responses of the respondents were documented by using a seven-point Likert scale ranging from 1 “Strongly disagree” to 7 “Strongly agree” as presented in Figure 3. 8.

3.4.2.1.6. EB measurement scale

Several scales to measure entrepreneurial behavior exist in the literature. However, the scale to measure entrepreneurial behavior used in the present study has been adapted from Kautonen et al. (2015) and has a Cronbach’s alpha of 0.85. The employed scale best corresponds to the context of the present study.



*Figure 3. 9: Items of entrepreneurial behavior
Source: Kautonen et al. (2015)*

The responses of the respondents were documented by using a seven-point Likert scale ranging from 1 “Strongly disagree” to 7 “Strongly agree” as presented in Figure 3. 9.

3.4.3. Overview of Questionnaire

A quantitative survey-based questionnaire is an effective, practical, useful, and successful tool for data collection from multiple respondents (McDaniel & Gates, 2006). It also provides an understanding of the behavior of respondents. Before developing the final version of the questionnaire, the adopted scales described in the previous section were sent to five different

experts and researchers from the University of Aveiro, Portugal. They analyzed the scales and proposed some adjustments both to the Portuguese and English versions. The full details of the questionnaire in both Portuguese and English are shown in Appendix A and Appendix B, consisting of eight parts:

- i. Section 1 – Presents the purpose of the study and instructions for the respondents to follow;
- ii. Section 2 – Presents some demographic detail of the respondents including nationality, age, gender, education, the field of education, education or training in entrepreneurship, and professional experience;
- iii. Section 3 – Presents the extent to which the respondents agree or disagree concerning the entrepreneurial alertness scale;
- iv. Section 4 – Presents the extent to which the respondents agree or disagree concerning the prior knowledge scale;
- v. Section 5 – Presents the extent to which the respondents agree or disagree concerning the entrepreneurial motivation scale;
- vi. Section 6 – Presents the extent to which the respondents agree or disagree concerning the opportunity recognition scale;
- vii. Section 7 – Presents the extent to which the respondents agree or disagree concerning the entrepreneurial intention scale;
- viii. Section 8 – Presents the extent to which the respondents agree or disagree concerning the entrepreneurial behavior scale;

3.4.4. Data Collection and Sample

Data collection is an important part and backbone of any empirical research. A carefully-constructed and structured questionnaire was used to elicit the data for the quantitative examination of the relationship between the different variables of the conceptual model.

The data was collected from university students through a self-administered questionnaire. The young and educated respondents are expected to provide less bias and more accurate data as compare to uneducated respondents (Kumar et al., 2017; Paul et al., 2016). Three Portuguese universities were selected for data collection: the University of Aveiro, the University of Porto, and the University of Coimbra. The questionnaires were presented to students in libraries, labs, study rooms, and classrooms with the due authorization of these universities.

A total of 1470 questionnaires were administered to the students in the three universities, out of which 1290 were validated: 520 from the University of Aveiro, 463 from the University of Porto, and 307 from the University of Coimbra. According to Hair et al. (2015), a sample size of 1290 is appropriate for the estimation of Structural Equation Models (SEM). In addition, the current sample size with six constructs of 52 items is considered to be appropriate ($1290 > 52 * 15 = 780$) since it is above the desired level of at least 10 to 15 response per item as prescribed by (Hair et al., 2015; Kline, 2015). Moreover, Barclay et al. (1995) showed that the sample size should be at least ten times greater than the largest number of predictors in each model, a requirement that is met in the current study.

3.5. Results and Discussion

This section is divided into two parts. The first part presents the preliminary results using SPSS-25 for the analysis, and the second part presents the results obtained using AMOS-24 path modelling. Subsequently, it is presented a general discussion of the results and main findings of the current study based on the theoretical and empirical examination of the causal relationships proposed in the hypothesized/conceptual model.

3.5.1. Preliminary Results

This section presents the preliminary results regarding the demographic, missing data treatment, normality of data, multicollinearity, reliability, and correlation analysis of the sample data.

3.5.1.1. Demographic Results

The demographic characteristics of respondents who participated in the study are presented in Figures 3. 10, 3. 11, and 3. 12, mainly gender, university and nationality of the respondents.

A total of 609 (47.2%) males and 681 (52.8%) females were surveyed out of 1290 respondents in this study. Most of the data was collected from the University of Aveiro with a frequency of 520 (40.3%), followed by the University of Porto with a frequency of 463 (35.9%), and finally the University of Coimbra with a frequency 307 (23.8%). Moreover, 1144 (88.7%) of the respondents were Portuguese, and 146 (11.3%) students were from other countries.

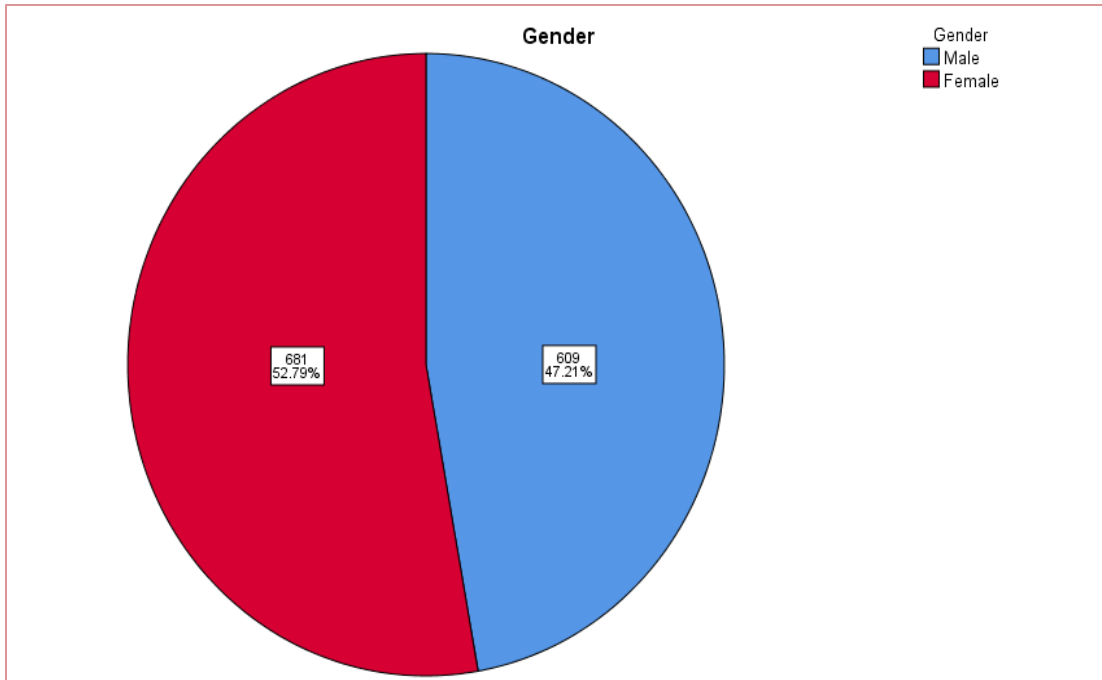


Figure 3. 10: Respondent's gender

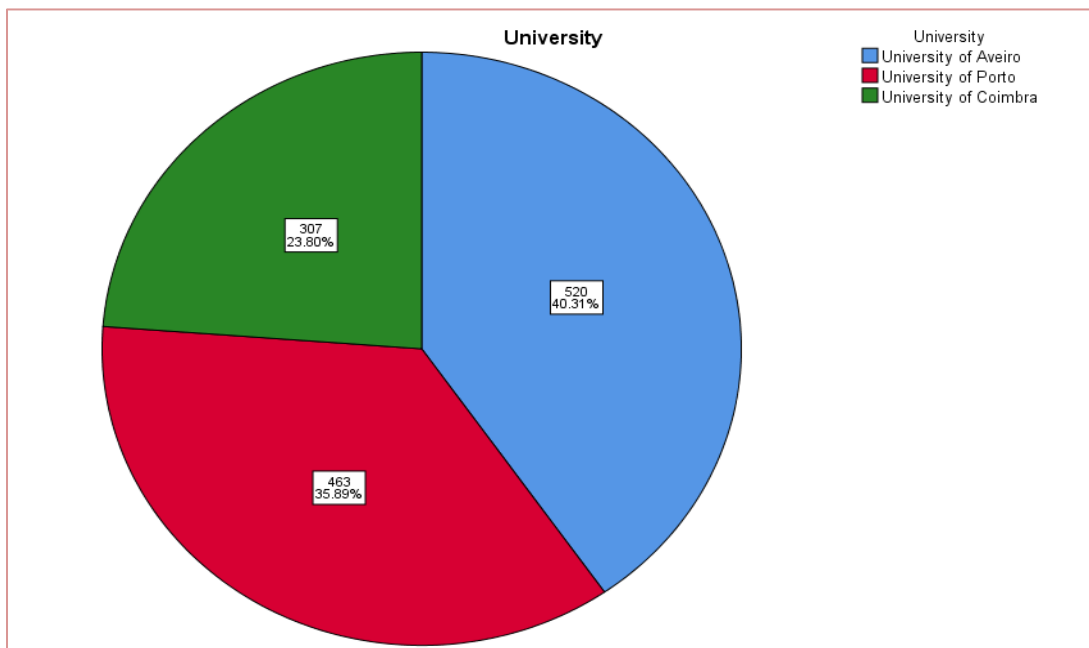


Figure 3. 11: Respondent's university

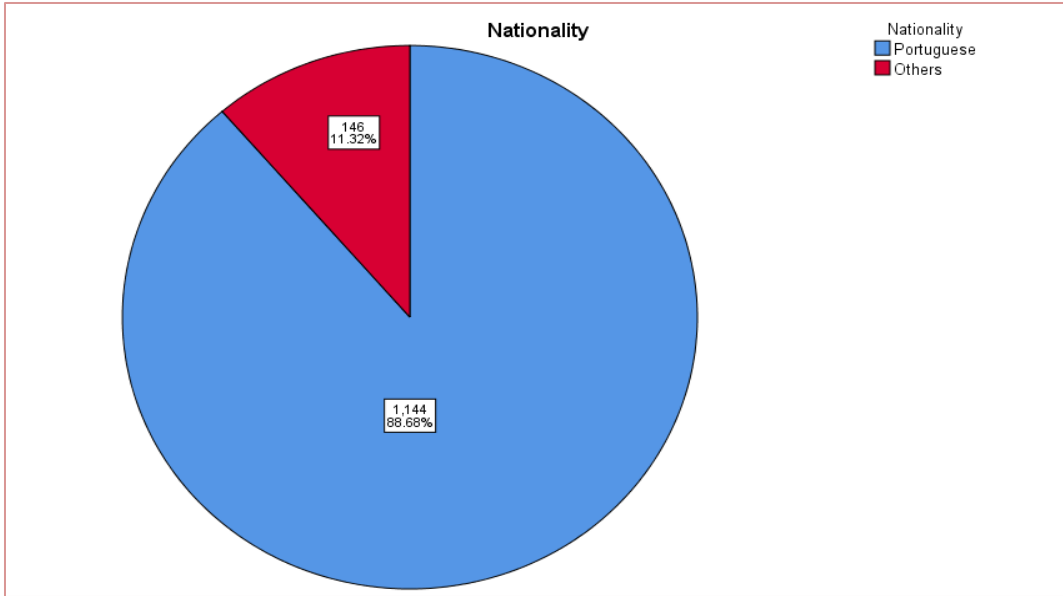


Figure 3. 12: Respondent's nationality

Figures 3. 13, 3. 14, 3. 15, 3. 16, and 3. 17 present the data regarding the age, degree, year of the degree, and entrepreneurship training of the respondents, respectively. Most respondents were under 25 years old, 57.8% belonging to the age group of 20 to 25 years old, followed by 33.7% in the age group under 20 years; 59 (4.6%) students had an age of more than 30 years, and 51 (4.0%) had an age between 26-30 years. Concerning their degree, 794 (61.6%) students in the sample hold a bachelor's degree, followed by 439 (34.0%) with a master's degree. Moreover, 51 PhD students, representing 4.6% of the total sample, also participated in the current study.

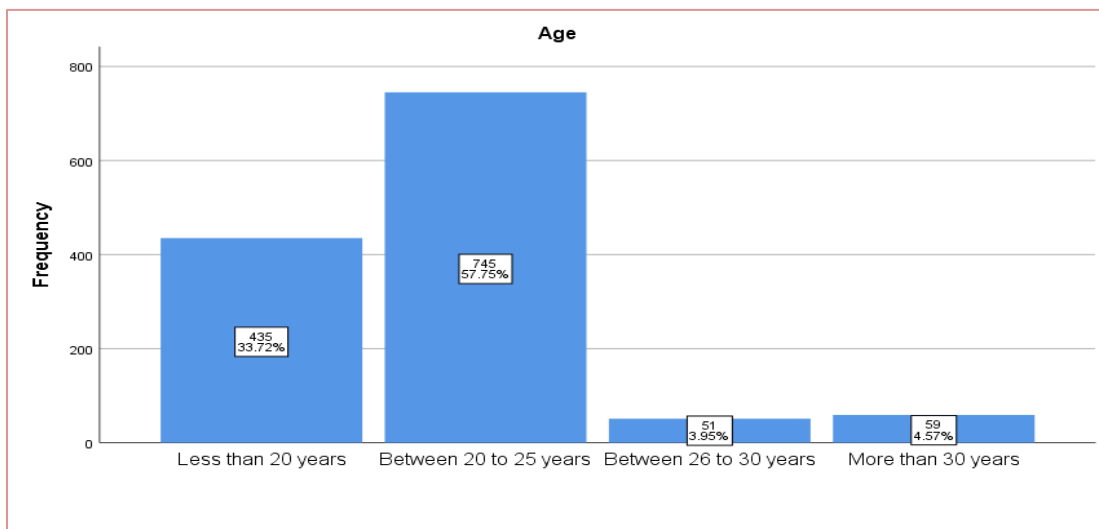


Figure 3. 13: Respondent's age

Concerning their study field, 649 (50.3%) students were from the scientific area of exact sciences and engineering, followed by 302 (23.4%) students from the social science and humanities, and 261 (20.2%) students from the life science and health field. Only 78 (6.0%) students were from the natural and environmental sciences.

Most of the students - 583 (45.2%) - were enrolled in the first year of their studies, and 473 (36.7%) students were in the second year. In turn, 232 (18.2%) students were in the third year, and only 2 (0.2%) students were in the fourth year. In addition, 898 (69.4%) students had no training in entrepreneurship, with 393 (30.4%) students having training in the field of entrepreneurship. In the case of students who had entrepreneurship training, 262 (20.3%) had taken some course within the academic curriculum, and 131 (10.2%) had participated in extracurricular training. Out of these, 147 (11.4%) students had 9-16 hours of entrepreneurship training followed by 74 (5.7%) with less than 8 hours, and 98 (7.6%) with 31-60 hours. Finally, 877 (68.0%) students had no professional experience, 216 (16.7%) students had less than one year of professional experience, and 101 (7.8%) students had 1-3 years of professional experience. Only 96 (7.4%) students reported having more than three years of professional experience.

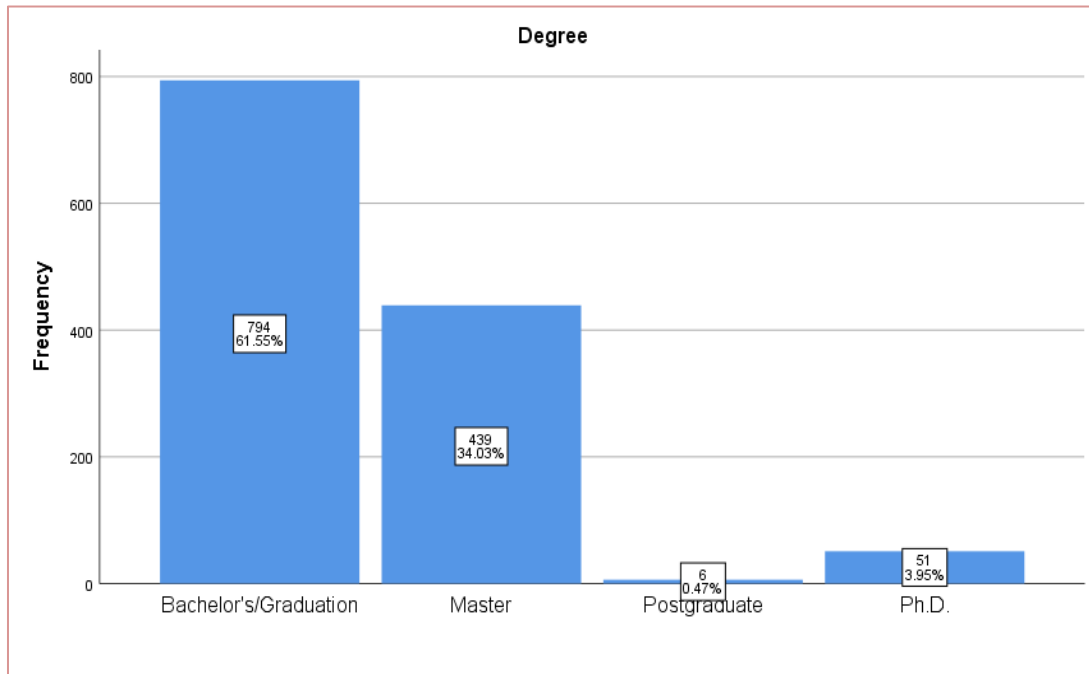


Figure 3. 14: Respondent's degree

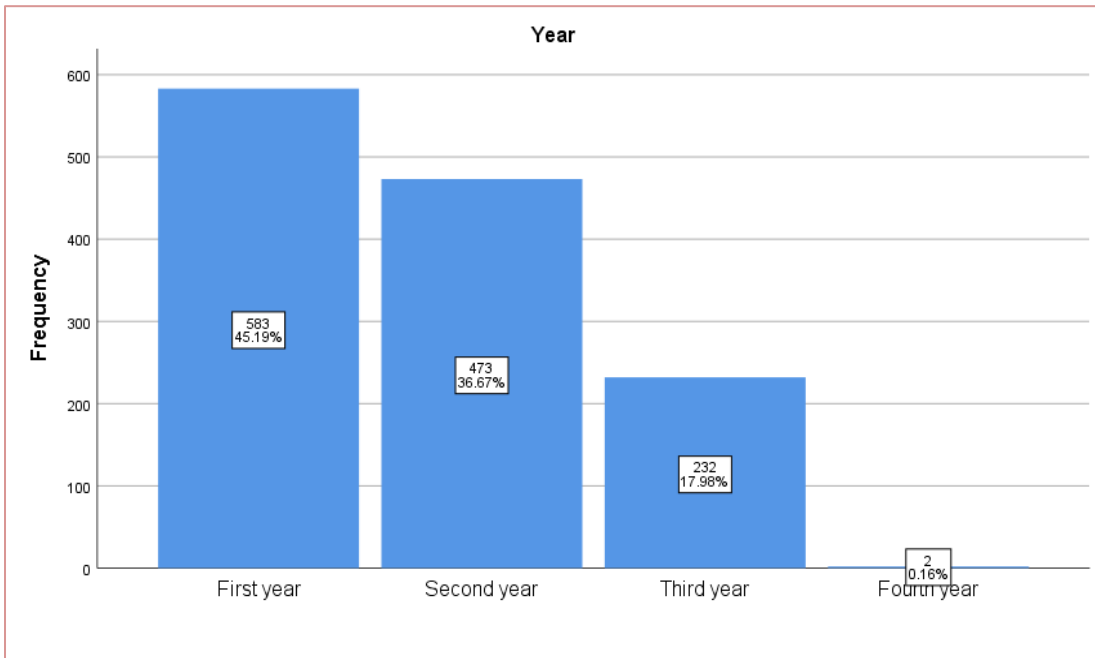


Figure 3. 15: Respondent's attending year of the degree

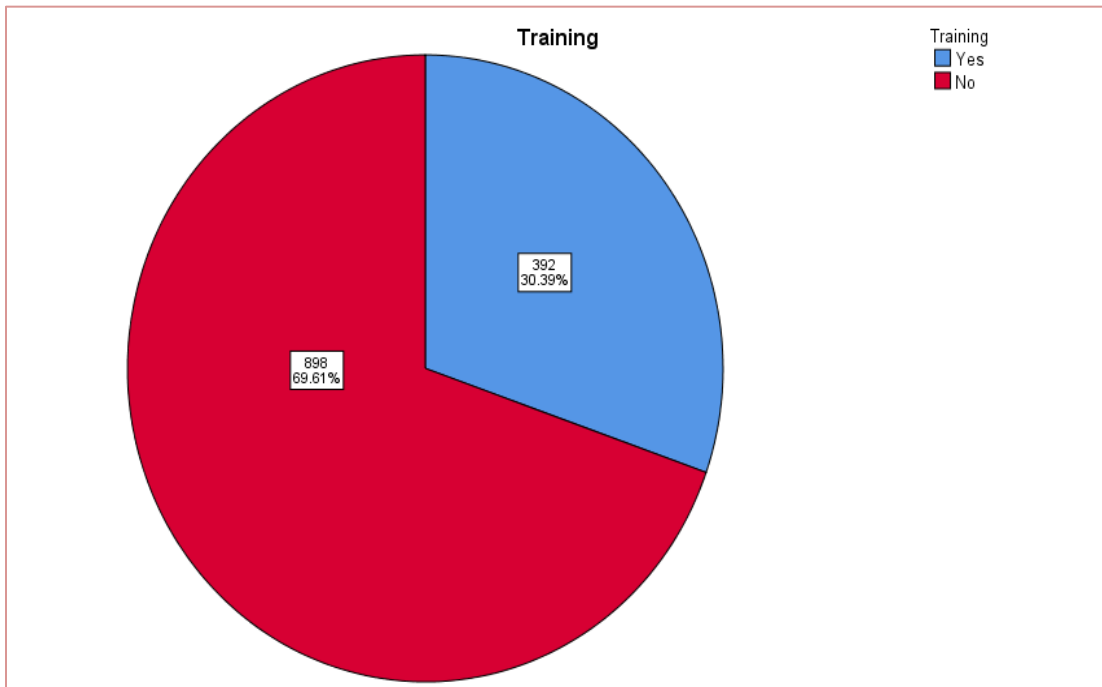


Figure 3. 16: Respondent's training in entrepreneurship

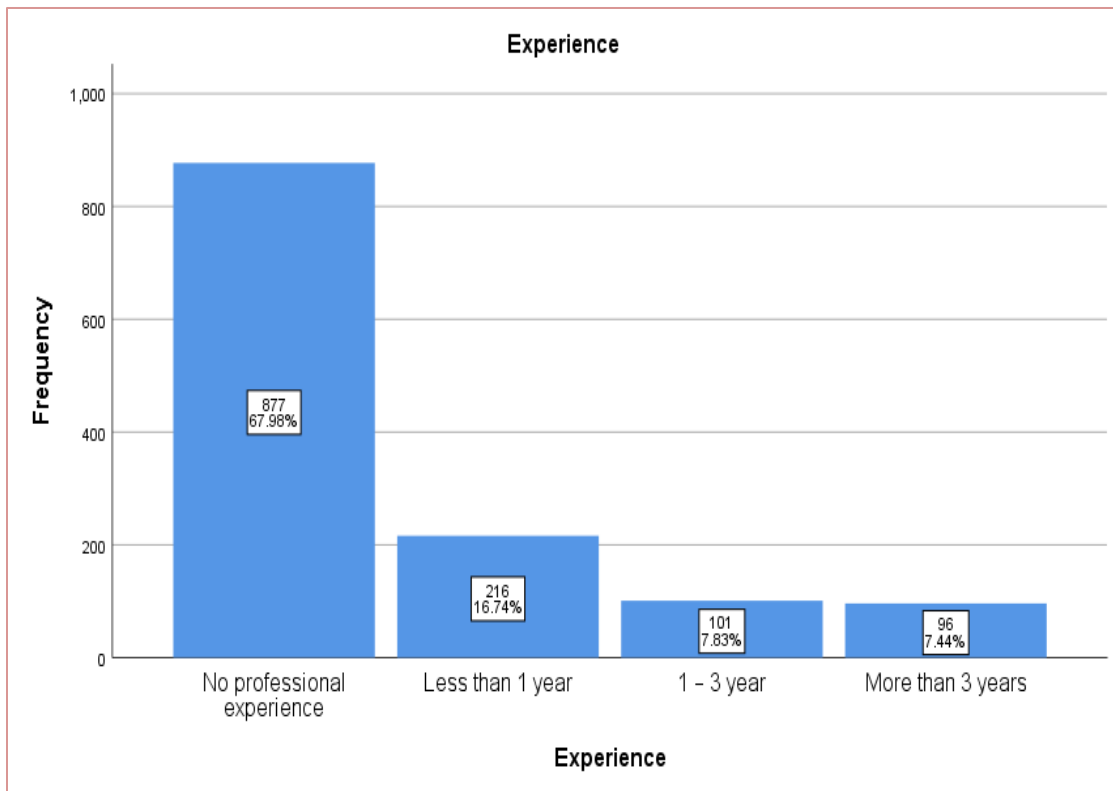


Figure 3. 17: Respondent's experience

Table 3. 3 presents a brief summary of all demographic variables used in the present study.

Table 3. 3: Demographic Characteristics

		Frequency	%			Frequency	%
University	Aveiro	520	40.3	Nationality	Portuguese	1144	88.7
	Porto	463	35.9		Other(s)	146	11.3
	Coimbra	307	23.8	Degree	Bachelor	794	61.6
Gender	Male	609	47.2		Master	439	34.0
	Female	681	52.8	Post graduate	6	0.5	
Age	< 20 years	435	33.7	Year	PhD.	51	4.0
	20 - 25 years	745	57.8		First	583	45.2
	26 - 30 years	51	4.0		Second	473	36.7
Training	> 30 years	59	4.6	Third	232	18.2	
	Yes	392	30.4	Fourth	2	0.2	
	No	898	69.4	Scientific Area	Life Sciences	261	20.2
Duration	< 8 hours	74	5.7		Natural Sciences	78	6.0
	9 - 16 hours	147	11.4		Exact Sciences	649	50.3
	17 - 24 years	6	0.5	Social Sciences	302	23.4	
Experience	25 - 30 years	11	0.9	Training Type	Extra-Curricular	131	10.2
	31- 60 years	98	7.6		Course Subject	262	20.3
	61 - 90 years	40	3.1	Experience	No experience	877	68.0
91 - 120 years	0	0	< 1 year		216	16.7	
> 120 years	17	1.3	1 - 3 years		101	7.8	
					> 3 years	96	7.4

3.5.1.2. Missing Data Treatment

A set of 1450 questionnaires was initially collected, but 160 cases were found to be highly incomplete and removed accordingly.

A final set of 1290 cases were retained, and then missing values were found through the frequency table. In the cases where the proportion of missing data is below approximately 5% (as a rule of thumb), the imputation method was used and missing data was replaced by mean.

Likewise, outliers were detected by analyzing the z-score, and those exceeding the z-score value of 3.30 were also replaced with the mean values. Although the replacement of missing values

and outliers with mean values instead of deletion from the data pool may influence the final results (Tabachnick & Fidell, 1996; Wegner, 2012), Dodeen (2003) concluded that “valid mean substitution (VMS) is an appropriate choice for researchers in treating missing values when working with Likert-type scales”.

3.5.1.3. Multicollinearity Analysis

The issue of multicollinearity was analyzed by calculating the variance inflation factor (VIF) for different predictor sets (Table 3. 4). Hair et al. (2013) shows that a VIF value greater than five and tolerance value less than 0.20 indicate the presence of multicollinearity in the data. As shown in Table 3.4, there is no multicollinearity issue in these data.

Table 3. 4: Multicollinearity Assessment

Predictors Variables	Dependent Variables	Collinearity Statistics	
		Tolerance	VIF
*Set 1	OR	0.597	1.674
	EI	0.619	1.614
	EM	0.745	1.343
	PK	0.678	1.476
	EA	0.612	1.634
*Set 2	OR	0.703	1.423
	EI	0.703	1.423
**Set 3	EA	0.924	1.082
	EM	0.924	1.082
**Set 4	EA	0.729	1.372
	PK	0.729	1.372
***Set 5	EM	0.886	1.129
	OR	0.886	1.129

Note: *Set 1-2 is reported with EB as dependent variable. **Set 3-4 dependent variable is OR. ***Set 5 depends variable is EI.

3.5.1.4. Normality of Data

After addressing the issues of missing data and outliers, the skewness analysis of all constructs was performed using SPSS-20 to check for normality of the data. The obtained skewness value divided by St. error of skewness gave the z score value between the threshold level of ± 3.3 (Doane & Seward, 2011; Tabachnick & Fidell, 1996), thereby indicating the normality of the data. Moreover, the kurtosis values less/smaller than 7 indicate no stronger deviation from a

normal distribution (Finney & DiStefano, 2013) which also ensure the normality of data. To further check the normality issues, histograms were drawn and it was observed that all variables have a proper bell shape.

3.5.1.5. Reliability Analysis

A reliability estimate test was conducted to evaluate the internal consistency for all the constructs, including entrepreneurial alertness, prior knowledge, opportunity recognition, entrepreneurial motivation, entrepreneurial intentions, and entrepreneurial behavior.

Table 3. 5: Reliability Analysis

Variables	Cronbach's Alpha
EA	0.865
PK	0.672
OR	0.873
EM	0.872
EI	0.940
EB	0.937
Overall	0.933

Cronbach's alpha is a tool to test the reliability of instruments (Hair et al., 1998). Table 3. 5 presents each variable with its Cronbach's Alpha.

The overall Cronbach's Alpha and for each of the variables, except for PK, was greater than 0.8, indicating a very good level of internal consistency (Kline, 2015). The Cronbach's Alpha for PK, with the value of 0.672, was also retained because it lies within the 0.6-0.7 acceptable range of reliability (Gaertner & Nollen, 1989; Loewenthal, 1996; Nunnally, 1967).

3.5.1.6. Descriptive and Correlation Analysis

The correlation analysis gives the degree of linear relationship among the different constructs. Table 3. 6 shows the mean values, standard deviation, and correlation values between all the variables of the study. The bivariate correlation among all the variables is found to be statistically significant at less than the 0.01 significance level ($p < 0.01$). The highest correlation value is between opportunity recognition and entrepreneurial intentions ($r = 0.545, p < 0.01$). On

the other hand, the lowest correlation value is between entrepreneurial motivation and entrepreneurial behavior ($r = 0.231, p < 0.01$).

Table 3. 6: Mean, Standard Deviation and Correlation

Means, Standard Deviations and Correlation Matrix								
	MEAN	S. D	EA	EI	PK	OR	EB	EM
EA	4.8484	0.79821	1					
EI	3.4895	1.54411	.396**	1				
PK	3.6063	0.55501	.521**	.323**	1			
OR	3.0575	0.54398	.459**	.545**	.391**	1		
EB	2.3844	1.42077	.306**	.421**	.252**	.453**	1	
EM	4.9866	1.08315	.276**	.425**	.261**	.338**	.231**	1

** . Correlation is significant at the 0.01 level (2-tailed).

3.5.1.7. Comparison of Universities

Because the current study comprises respondents from three universities (three groups), the analysis of variance (ANOVA) test was used to compare their responses. Each possible null (H_0) and the alternative hypothesis (H_1) are shown in the equations below. Additionally, in each equation, the A, P, and C in subscripts represent the University of Aveiro, University of Porto, and the University of Coimbra, respectively.

$$H_0: MeanEA_A = MeanEA_P = MeanEA_C \quad (1)$$

$$H_1: MeanEA_A \neq MeanEA_P \neq MeanEA_C \quad (2)$$

$$H_0: MeanEI_A = MeanEI_P = MeanEI_C \quad (3)$$

$$H_1: MeanEI_A \neq MeanEI_P \neq MeanEI_C \quad (4)$$

$$H_0: MeanPK_A = MeanPK_P = MeanPK_C \quad (5)$$

$$H_1: MeanPK_A \neq MeanPK_P \neq MeanPK_C \quad (6)$$

$$H_0: MeanOR_A = MeanOR_P = MeanOR_C \quad (7)$$

$$H_1: MeanOR_A \neq MeanOR_P \neq MeanOR_C \quad (8)$$

$$H_0: MeanEB_A = MeanEB_P = MeanEB_C \quad (9)$$

$$H_1: MeanEB_A \neq MeanEB_P \neq MeanEB_C \quad (10)$$

$$H_0: MeanEM_A = MeanEM_P = MeanEM_C \quad (11)$$

$$H_1: MeanEM_A \neq MeanEM_P \neq MeanEM_C \quad (12)$$

Table 3. 7: Comparison of Universities

ANOVA Test Statistics					
Constructs	Sum of Square	df	Mean Square	F	Sig
EA	1.399	2	0.700	1.098	.334
EI	0.955	2	0.477	0.200	.819
PK	1.975	2	0.987	3.216	.040**
OR	0.284	2	0.142	0.479	.620
EB	0.559	2	0.275	0.136	.873
EM	9.708	2	4.854	4.158	.016**

Note: *** P<0.01; ** P<0.05; * P<0.10

The mean comparison across the three universities reported in Table 3. 7 reveals statistically insignificant differences for all the variables, except for prior knowledge and entrepreneurial motivation. Thus, the null hypothesis for entrepreneurial alertness ($P\text{-value} = 0.334 > \alpha = 0.05$), entrepreneurial intention ($P\text{-value} = 0.819 > \alpha = 0.05$), opportunity recognition ($P\text{-value} = 0.620 > \alpha = 0.05$), entrepreneurial behavior ($P\text{-value} = 0.873 > \alpha = 0.05$) is not rejected. On the other hand, only the null hypotheses for prior knowledge ($P\text{-value} = 0.040 < \alpha = 0.05$) and entrepreneurial motivation ($P\text{-value} = 0.003 < \alpha = 0.05$) is rejected. These results mean that for entrepreneurial alertness, entrepreneurial intention, opportunity recognition and entrepreneurial behavior, the responses among the students of all universities are similar, indicating that the students think and behave in the same way and present the same attitudes towards the entrepreneurial process. Nevertheless, they are different in their views regarding prior knowledge and entrepreneurial motivation.

3.5.2. Main Results

This section presents the main results obtained using AMOS-24 concerning the measurement model, the structural model, and the hypotheses' testing for both direct and indirect effects.

3.5.2.1. Measurement Model

The two-step approach to structural equation modelling (SEM) consists in the estimation of the measurement model and in the evaluation of the structural model (Barclay et al., 1995). The measurement model indicates the relationship between items and constructs (Hair et al., 2013). Furthermore, to evaluate the measurement model relatively to the proposed model, the internal

consistency, convergent validity, and discriminant validity of the constructs was evaluated following the recommendations of Gefen et al. (2011) and Hair et al. (2012, 2013). The measurement model, or outer model, is used to specify the correspondence between measured and latent variables. In the two-step approach, different methods are required for the evaluation of the formative and reflective measurement model (Hair et al., 2017). This study deals with the reflective measurement model, as all used constructs are reflective constructs.

Figure 3. 18 presents the six constructs with fifty-two items for further and final analysis by applying the confirmatory factor analysis (CFA).

3.5.2.1.1. Internal Consistency

The first criterion for the evaluation of the outer (measurement) model is the evaluation of internal consistency (Hair et al., 2017). The internal consistency is generally measured by the estimation of Cronbach's Alpha and composite reliability. The values of Cronbach's Alpha were 0.865, 0.940, 0.672, 0.873, 0.937, and 0.872 for entrepreneurial alertness, entrepreneurial intentions, prior knowledge, opportunity recognition, entrepreneurial behavior, and entrepreneurial motivation, respectively. All values were in an acceptable range. The overall reliability for all constructs was 0.933, showing a high internal consistency. Similarly, the composite reliability also shows high internal consistency among the latent variables. The values for composite reliability were 0.867 (entrepreneurial alertness), 0.940 (entrepreneurial intentions), 0.701 (prior knowledge), 0.874 (opportunity recognition), 0.939 (entrepreneurial behavior) and 0.856 (entrepreneurial motivation). For both composite reliability and Cronbach's Alpha, the recommended threshold value is 0.70 (Hair et al., 2013). Table 3. 8 presents the composite reliability for all latent variables.

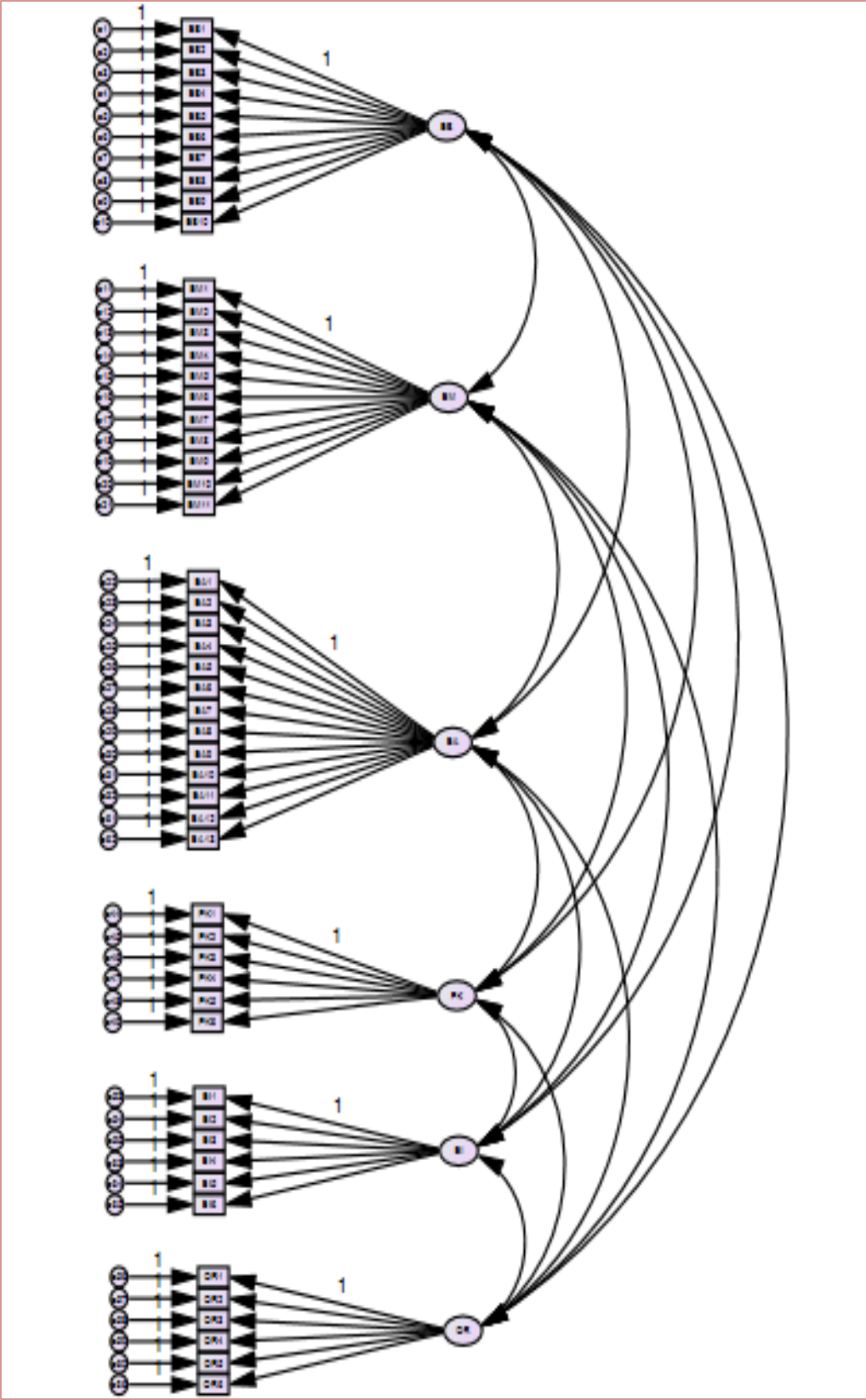


Figure 3. 18: CFA Measurement Model

Table 3. 8: Composite Reliability

Latent variables	Composite Reliability
EB	0.939
EM	0.856
EA	0.867
PK	0.701
EI	0.94
OR	0.874

3.5.2.1.2. Convergent Validity

In this context, the term validity could be defined as “the extent to which a measure adequately represents the underlying construct that it is supposed to measure” (Bhattacharjee, 2012). In other words, if the measurement instrument is error-free and measures what is supposed to be measured, then it indicates high validity of the measurement. Hair et al. (2017, p. 102) defined the term convergent validity as “the extent to which a measure correlates positively with alternative measures of the same construct”. The average variance extract (AVE) value was computed to examine convergent validity, which is generally measured at a cut-off value of 0.5 (Fornell & Larcker, 1981). Table 3. 9 shows the AVE values for the six measure constructs, all of which are above the 0.5 threshold.

Table 3. 9: Average Variance Extract (AVE)

Latent Variable	AVE
EB	0.608
EM	0.555
EA	0.522
PK	0.510
EI	0.725
OR	0.635

3.5.2.1.3. Factor Loading

Standardized factor loading, rather than unstandardized factor loading, was employed considering a minimum threshold value of 0.5 as is common in several other studies (Netemeyer

et al., 1995). This was done to identify those items which are uncorrelated with other items within a construct and ultimately eliminated to have better/accurate instruments (Abell et al., 2009). Also, further attention was paid to understand which items should be, and which items should not be, part of the study to enhance the overall fitness of good (Brown, 2014). As stated by several authors, the deletion of items from a reflective construct does not alter its actual conceptual meaning (Jarvis et al., 2003; MacKenzie et al., 2005). MacKenzie et al. (2005) further explain that in reflective measures, the direction of causality from constructs to items ultimately explain the variation in the measures due to the construct.

Table 3. 10 shows the factor loading of indicators.

Table 3. 10: Factor Loading

Factor	Items	Estimates	Factor	Items	Estimates
Entrepreneurial Alertness	EA 2	0.570	Prior Knowledge	PK 2	0.818
	EA 5	0.602		PK 3	0.588
	EA 6	0.625	Entrepreneurial Intentions	EI 1	0.670
	EA 7	0.675		EI 2	0.799
	EA 8	0.692		EI 3	0.944
	EA 9	0.724		EI 4	0.946
	EA 10	0.753		EI 5	0.928
	EA 11	0.560	EI 6	0.784	
	EA 12	0.583	Entrepreneurial Behavior	EB 1	0.750
	EA 13	0.576		EB 2	0.773
	Opportunity Recognition	OR 1		0.819	EB 3
OR 2		0.838		EB 4	0.801
OR 4		0.750		EB 5	0.881
OR 6		0.777		EB 6	0.845
Entrepreneurial Motivation	EM 2	0.854		EB 7	0.803
	EM 7	0.578	EB 8	0.778	
	EM 8	0.542	EB 9	0.742	
	EM 9	0.971	EB 10	0.626	
	EM 11	0.689			

From this standpoint, a reflective measurement model shows better internal consistency and reliability, since it doesn't make an impact if some of the items are deleted to improve the overall measurement results (MacKenzie et al., 2005), namely due to the fact that all items are tested from the uni-dimensional domain and demonstrate all aspects of the same measured construct.

Thus, the deletion of some items from the measurement model does not alter the actual meaning of the construct measured as “for all practical purposes, equally reliable effect indicator of a unidimensional (construct) are interchangeable” (Bollen & Lennox, 1991) and may ultimately be removed.

In addition, Table 3. 11 presents the deleted items within factors and their estimated values. As can be observed, all of these items have values lower than the 0.5 threshold level according to the guideline of (Netemeyer et al., 1995).

Table 3. 11: Deleted Items

Factor	Items	Estimates	Factor	Items	Estimates
Entrepreneurial Alertness	EA 1	0.450	Opportunity Recognition	OR 3	0.266
	EA 3	0.499		OR 5	0.240
	EA 4	0.140	Entrepreneurial Motivation	EM 1	0.453
Prior Knowledge	PK 1	0.488		EM 3	0.499
	PK 4	0.268		EM 4	0.465
	PK 5	0.438		EM5	0.425
	PK6	0.469		EM 6	0.496
			EM 10	0.493	

3.5.2.1.4. Discriminant Validity

The term discriminant validity is defined as “ the extent to which a construct is truly distinct from other constructs by empirical standards” (Hair et al., 2017). The discriminant validity is also known as divergent validity, as it deals with the unrelated construct. In general, the Fornell-Larcker principle is used to examine discriminant validity. According to Hair et al. (2017) “It (Fornell-Larcker criterion) compares the square root of the AVE values with the latent variable correlations. Specifically, the square root of each construct's AVE should be greater than its highest correlation with any other construct”. The evidence of discriminant validity is presented in Table 3. 12, with the square root of AVE placed on the diagonal and the adjacent correlation coefficient values placed on the off-diagonal. As can be observed, the value of the square root of AVE for each dimension is greater than the values of the lower-left triangle presented as off-diagonal, thus establishing the discriminant validity (Hair et al., 2013).

Table 3. 12: Fornell-Larcker Criterion

Latent Variables	EB	EM	EA	PK	EI	OR
EB	0.779					
EM	0.141***	0.745				
EA	0.260***	0.175***	0.722			
PK	0.201***	0.244***	0.560***	0.714		
EI	0.428***	0.379***	0.281***	0.241***	0.851	
OR	0.499***	0.318***	0.451***	0.412***	0.680***	0.797

Note: Diagonal values > non diagonal values (Hair et al., 2013)

3.5.2.1.5. Model Fit Indices

According to Byrne (1998), three methods are used to estimate the model. First, the squared multiple correlations for each indicator is used to estimate the measurement model. Second, the significance and feasibility of the parameter are assessed together with the suitability of standard errors. Third, the model fit indices are calculated to estimate the measurement model. The model fit indices method is currently widely used because it was suggested and adopted by many researchers in past studies (Hoe, 2008). Thus, the current study uses the model fit indices to estimate the measurement model.

Several indices, namely the χ^2 value to degree of freedom ratio (χ^2/df), the Goodness of Fit Index (GFI), the Adjusted Goodness Fit Index (AGFI), the Comparative Fit Index (CFI), the Normed Fit Index (NFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), have been calculated to estimate the model fitness. The values for the GFI, AGFI, CFI, NFI, and TLI indices above the cut-off level of 0.90 represent a satisfactory model fit. The RMSEA value below the threshold level of 0.08 reflects an acceptable fit. Jöreskog and Sörbom (1993) show that “a value up to 0.08 for an RMSEA fit index indicates reasonable errors of approximation in the population”. In addition, MacCallum et al. (1996) suggested that the value for RMSEA up to 0.05 presents a good model fit. The Chi-Square (χ^2) statistic, and its value to the degree of freedom ratio (χ^2/df), is also an alternative to measure the fitness of the model. According to Hu and Bentler (1999), a χ^2 value greater than 2-3 times the degree of freedom is acceptable. Also, a value lower than 5 for the χ^2/df ratio represents a desirable model fitness (Hu & Bentler, 1999; Jöreskog & Sörbom, 1993).

Table 3. 13 presents the acceptance levels of the different model fit indices along with the computed fit indices.

Table 3. 13: Calculated Fit Indices and Level of Acceptable Fit for Measurement Model

Sr #	Indices	Level of Acceptable Fit	Source	Calculated Fit Indices
1	CMIN/DF	$\chi^2/df \leq 5$	(L. T. Hu & Bentler, 1999)	3.34
2	Goodness of Fit Index (GFI)	$.90 \leq GFI \leq 1$	(L. T. Hu & Bentler, 1999)	0.93
3	Adjusted Goodness Fit Index (AGFI)	$.90 \leq AGFI \leq 1$	(Hooper et al., 2008)	0.91
4	Comparative Fit Index (CFI)	$.90 \leq CFI \leq 1$	(Kline, 2015)	0.96
5	Normed Fit Index (NFI)	$.90 \leq NFI \leq 1$	(Tabachnick & Fidell, 1996)	0.95
6	Ticker-Lewis Index (TLI)	$.90 \leq TLI \leq 1$	(Kline, 2015)	0.96
7	Root Mean Square Error of Approximation (RMSEA)	$0 \leq RMSEA \leq 0.08$	(L. T. Hu & Bentler, 1999)	0.043

3.5.2.2. Structural Model

Following the measurement model, the next step is to estimate the structural model. According to Hair et al. (2013), the relationship between the exogenous and endogenous variables is measured through the examination of the structural model. The structural model relates to the conceptual model, and therefore, its assessment determines whether and how the empirical data supports the theoretical model.

Before analyzing the hypothesized model by path diagram, the model fit indices were estimated for the structural model. The goodness of fit statistics, (CMIN/DF (χ^2/df) = 3.91, GFI = 0.919, AGFI = 0.902, CFI = 0.956, NFI = 0.942, TLI = 0.950, IFI = 0.956, RMSEA = .048) indicate appropriate fit according to the guidelines suggested by (Hair et al., 2015). All model fit indices for the structural model along with their acceptance level are presented in Table 3. 14.

Table 3. 14: Calculated Fit Indices and Level of Acceptable Fit for Structural Model

Sr #	Indices	Level of Acceptable Fit	Source	Calculated Fit Indices
1	CMIN/DF	$\chi^2/df \leq 5$	(L. T. Hu & Bentler, 1999)	3.91
2	Goodness of Fit Index (GFI)	$.90 \leq GFI \leq 1$	(L. T. Hu & Bentler, 1999)	0.92
3	Adjusted Goodness Fit Index (AGFI)	$.90 \leq AGFI \leq 1$	(Hooper et al., 2008)	0.90
4	Comparative Fit Index (CFI)	$.90 \leq CFI \leq 1$	(Kline, 2015)	0.95
5	Normed Fit Index (NFI)	$.90 \leq NFI \leq 1$	(Tabachnick & Fidell, 1996)	0.94
6	Ticker-Lewis Index (TLI)	$.90 \leq TLI \leq 1$	(Kline, 2015)	0.95
7	Incremental Fit Index (IFI)	$.90 \leq TLI \leq 1$	(Kline, 2015)	0.96
8	Root Mean Square Error of Approximation (RMSEA)	$0 \leq RMSEA \leq 0.08$	(L. T. Hu & Bentler, 1999)	0.048

Moreover, by using the different statistically standardized estimates, the path coefficients of the model are presented in Figure 3. 19.

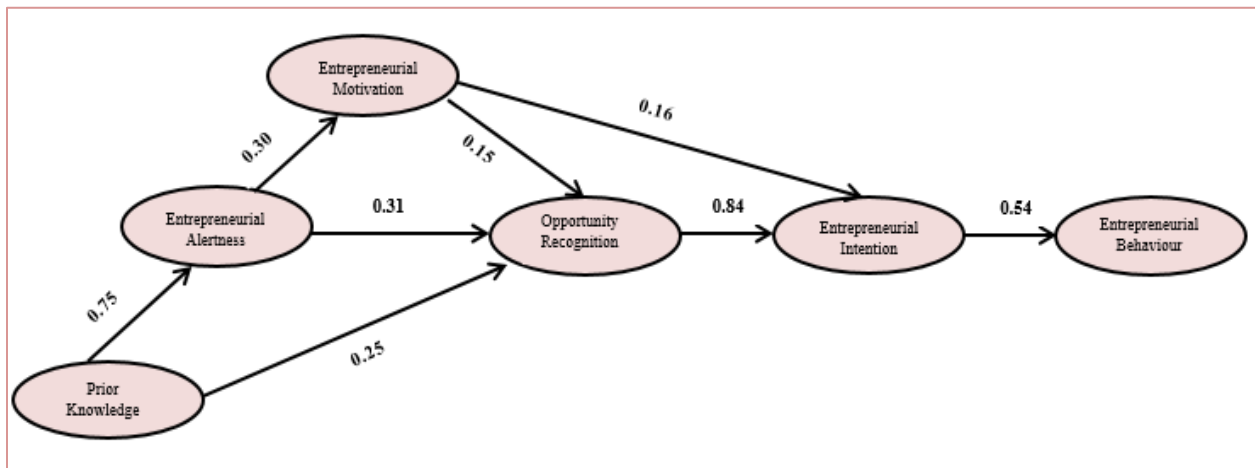


Figure 3. 19: Structural Model

3.5.2.2.1. Hypothesis Testing

The statistical significance of the estimated coefficients was assessed through the critical ratio (CR) and its associated p -value. The CR shall be greater than 1.96 and the p -value must be less than the 0.05 significance level for evidence supporting the hypothesized path coefficients.

Table 3. 15 presents the outcomes of the estimated direct relationship among all studied latent variables. Overall, the results show that all relationships are statistically significant. The path coefficient is statistically significant for the relationship between prior knowledge and opportunity recognition ($\beta = 0.25$, $p < 0.001$). Hence, hypothesis 1, stating that prior knowledge has a positive impact on opportunity recognition among university students, is supported.

Table 3. 15: Structural Model Results

Sr. No.	Hypothesis	Relationship	β-Value	S.E.	C.R.	P-Value	Results
1	H1	PK → OR	0.253***	0.059	4.249	0.000	Supported
2	H2	PK → EA	0.751***	0.064	11.65	0.000	Supported
3	H3	EA → OR	0.31***	0.042	7.367	0.000	Supported
4	H4	EA → EM	0.297***	0.05	5.968	0.000	Supported
5	H5	EM → OR	0.145***	0.018	8.119	0.000	Supported
6	H6	EM → EI	0.157***	0.021	7.454	0.000	Supported
7	H7	OR → EI	0.844***	0.045	18.744	0.000	Supported
8	H8	EI → EB	0.537***	0.039	13.728	0.000	Supported

Note: *** indicates 1% level of significance.

Similarly, hypothesis 2 (Prior knowledge has a positive impact on entrepreneurial alertness among university students) is statistically significant ($\beta = 0.75$, $p < 0.001$); hypothesis 3 (Entrepreneurial alertness has a positive impact on opportunity recognition among university students) is statistically significant ($\beta = 0.31$, $p < 0.001$); hypothesis 4 (Entrepreneurial alertness has a positive impact on entrepreneurial motivation among university students) is statistically

significant ($\beta = 0.29, p < 0.001$); hypothesis 5 (Entrepreneurial motivation has a positive impact on opportunity recognition among university students) is statistically significant ($\beta = 0.14, p < 0.001$); hypothesis 6 (Entrepreneurial motivation has a positive impact on entrepreneurial intentions among university students) is statistically significant ($\beta = 0.15, p < 0.001$); hypothesis 7 (Opportunity recognition has a positive impact on entrepreneurial intentions among university students) is statistically significant ($\beta = 0.84, p < 0.001$); and, hypothesis 8 (Entrepreneurial intention has a positive impact on entrepreneurial behavior among university students) is statistically significant ($\beta = 0.53, p < 0.001$). Therefore, the data support all the hypotheses previously developed. In addition, 50% of the variance associated with entrepreneurial intention was explained by prior knowledge, entrepreneurial alertness, entrepreneurial motivation and opportunity recognition; nevertheless, only 18% of the variance associated with entrepreneurial behavior was explained by entrepreneurial intention.

3.5.2.3. Mediation Analysis

Mediation refers to the possible presence of a mediator variable between the predictors and the outcome variable. According to Shrouf and Bolger (2002), mediation exists when a causal relationship between a dependent and independent variables is explained by a third variable. In order to examine to existence of mediating relationships, the coefficient for indirect effects were estimated. The mediation relationships were then tested by using the bootstrapping procedure with 5000 resample in AMOS version 24. Table 3. 16 presents the results of these procedures. Overall, the results show that all relationships are statistically significant since the upper and lower bounds for the estimated coefficients do not contain the zero value (Cheung & Lau, 2008). As a result, the mediating relationships previously hypothesized are supported.

Table 3. 16: Mediation (Indirect Effect) Results

Sr. No.	Hypothesis	Relationship	β- Value	LB	UP	Results
1	H _{3a}	PK → EA → OR	0.265	0.201	0.345	Supported
2	H _{5a}	EA → EM → OR	0.043	0.026	0.065	Supported
3	H _{7a}	EM → OR → EI	0.123	0.09	0.162	Supported

3.5.2.4. *Multi-Groups Analysis*

According to the literature, it is generally accepted that men show higher entrepreneurial intention and entrepreneurial behaviour than women (e.g. Yordanova & Tarrazon, 2010). Previous studies also report that students that were enrolled in entrepreneurship education show lower entrepreneurial intention and entrepreneurial behaviour (Nowiński et al., 2019) than other students. Therefore, based on these assumptions that these groups may present differences, we proceed with a multi-group analysis.

Hair et al. (2014) defined multi-group analysis as “a class of techniques that allows testing for difference between identical models estimated for different groups of data”. Multi-group analysis requires the existence of mutually exclusive groups, such as groups that have different socio-demographic (observable) characteristics.

There are some prerequisites for multi-group analysis. One of these is the need for an adequate sample, as Hair et al. (2015, p. 635) illustrated that “multi-group analysis requiring an adequate sample for each group”. In the present study, the sample size employed is appropriate for each group and also meets the requirements as prescribed by Kline (2015). Moreover, in the multi-group analysis, various structural models are specified, and then sequentially compared to test for invariance, or lack thereof. Despite the existence of several approaches to test for invariance, Marôco (2010) proposes the following steps: i) test for configural invariance through testing the fit of baseline models of the two groups; ii) test for measurement invariance (weak, strong and strict) through constraining factor loading, item intercepts, error variances); iii) test for structural invariance through constraining covariance factors.

Therefore, we carry out multi-group analysis experiments to determine individual paths, individual parameters, and the difference between groups. Furthermore, the conceptual model is unconstrained, meaning that the parameter associated to each group is uniquely estimated. In simpler terms, no constraint replaces other parameters. It is typically a baseline model that we compare to other models. In addition, Savalei and Kolenikov (2008) explained that unconstrained estimation is a simpler procedure and, at the same time, it is more informative about misfit sources.

Moreover, the current study uses fit indices for the nested sequence model in the multi-group analysis regarding the model's estimates. This method is widely accepted and also extensively used by many researchers (Marôco, 2010). All the fit indices were above the threshold level

(Table 3. 17), indicating that the structural patterns are similar across groups. As a consequence, the configural model can be used as a baseline to compare with the other model in the invariance hierarchy, and ensures further multi-group analysis may be carried out.

Table 3. 17: Fit Indices for Nested Sequence Model in Multi-group Analysis

Index	χ^2/DF	RMSEA	NFI	CFI	TLI	IFI
Level of Acceptable Fit	$\chi^2/df \leq 5$	$0 \leq RMSEA \leq 0.08$	$.90 \leq NFI \leq 1$	$.90 \leq CFI \leq 1$	$.90 \leq TLI \leq 1$	$.90 \leq IFI \leq 1$
Gender	3.291	.042	.900	.924	.917	.925
Entrepreneurship Training	3.094	.040	.909	.936	.929	.936

3.5.2.4.1. Multi-group analysis based on Gender

To assess metric invariance, we evaluated any change in measurement parameters and structural relationships in the given model across a demographic variable (gender). Byrne et al. (1989) suggested invariance routine limiting measurement model to factor loading (FL), factor correlation (FC), and structural parameters (SP) explaining hypothesized structural relationship. To analyze the invariance factor loading, it is hypothesized that factor loading for both groups is equal. The Chi-square value between the baseline model (BM) and the constrained model (CM) was not statistically significant (CMIN = 21.46, $p > 0.05$). So, the FL of the two gender groups was invariant. The Chi-square value in the structural parameter between the baseline and the constraint models was not noticeable (CMIN = 4.60, $p > 0.05$). Therefore, SP was also invariant between the gender groups. Finally, to analyze the factor correlation, the Chi-square value difference test between BM and CM was not significant and noticeable (CMIN = 0.46, $p > 0.05$), meaning that the FC of the two groups was also invariant. These results are presented in Table 3. 18. Thus, since the three invariances tests were all satisfied, the hypothesis of invariance of the predictive model across genders was not rejected.

Table 3. 18: Invariance Tests across Gender

Model Comparison	Df diff	CMIN diff	P-values
Unconstrained vs Measurement weights	28	21.46	.805
Measurement weights vs Structural weights	8	4.60	.799
Structural weights vs Structural covariance's	1	0.46	.495

According to Putnick and Bornstein (2016), measurement invariance is a prerequisite to comparing group means. Therefore, we tested the difference of the mean score to determine whether there is any statistically significant difference between males and females, through an independent samples t-test. In this case, the assumptions associated with this test were verified, namely normality (skewness and kurtosis analysis) and the homogeneity of variance (robust if the samples are large and about equal¹).

The estimated mean scores are presented in Table 3. 19, indicating significant differences in entrepreneurial alertness ($t = 2.028$; $p < 0.05$; $d = 0.112$) and in opportunity recognition ($t = 2.245$; $p < 0.05$; $d = 0.125$) between male and female students.

Table 3. 19: Male vs. Female differences analysis

Construct	Mean (Male; $n = 609$)	SD	Mean (Female; $n = 681$)	SD	t-test (df)	P-Value	Effect Size (d)
Entrepreneurial alertness	4.93	0.98	4.82	0.99	2.028 (1288)	0.043	0.112
Entrepreneurial intentions	3.54	1.72	3.37	1.69	1.834 (1288)	0.067	0.102
Prior knowledge	3.75	0.63	3.74	0.63	0.373 (1288)	0.709	0.021
Opportunity recognition	3.08	0.74	2.30	0.75	2.245 (1288)	0.025	0.125
Entrepreneurial behavior	2.29	1.65	2.13	1.57	1.916 (1288)	0.056	0.107
Entrepreneurial motivation	5.16	1.37	5.28	1.37	-1.557 (1288)	0.120	-0.087

¹ As a rule of thumb, the large sample should not be more than 1.5 times the size of the smaller sample.

In this case, female students show lower entrepreneurial alertness and lower ability to recognise opportunity than male students. However, the rest of the constructs are not statistically significantly different between gender group. Moreover, effect size quantifies the size of difference between two groups. It is an important tool to measure, report and interpreting the effectiveness. Effect sizes for entrepreneurial alertness, entrepreneurial intentions, prior knowledge, opportunity recognition, entrepreneurial behaviour and entrepreneurial motivation are small (Cohen, 1988).

3.5.2.4.2. Multi-group analysis based on Entrepreneurship Training

Concerning the effect of entrepreneurship training, we performed multi-group SEM analysis to examine any change in measurement parameters and structural relationships in the proposed model. According to the recommendation of Byrne et al. (1989), the measurement model to factor loading (FL), factor correlation (FC), and structural parameters (SP) is limited by invariance routine. The Chi-square value difference test between the baseline and constraint model was significant and noticeable (CMIN = 62.30, $p < 0.05$). It shows that the FL of the two groups was variant. The Chi-square value between the BM and CM was noticeable (CMIN = 31.26, $p < 0.05$), showing that that SP between the two groups was variant. These results indicate that the students with entrepreneurship education/training respond to items differently than those with no training, which means that the strengths of the relationships between specific scale items and their respective underlying construct are not the same across these two groups. Therefore, these results indicate that the proposed model is operating in different ways and the underlying constructs do not have the same factorial and metric structure among students who had some kind of entrepreneurship education compared to those who had not.

Finally, for factor correlation (FC), the Chi-square value difference test between the BM and CM was not significant and noticeable (CMIN = 3.32, $p > 0.05$), showing that the factor correlation of the two groups was invariant. The detailed results of the invariance model are presented in the Table 3. 20.

Table 3. 20: Invariance Tests across Entrepreneurship Training

Model Comparison	Df diff	CMIN diff	P-values
Unconstrained vs Measurement weights	27	62.30	.000
Measurement weights vs Structural weights	8	31.26	.000
Structural weights vs Structural covariance's	1	3.32	.068

Further comparison was performed by testing the equivalence of parameters two-by-two with critical ratios as proposed by (Costa et al., 2017). The current study also followed the suggestion of Bentler (1980) that the critical ratio (CR), also known as (Z), shall be used to study the hypothetical path difference between groups. The detailed path difference of the hypothesized model is presented in the Table 3. 21. Results show that the factor loadings differ significantly between the two samples since all Z values are higher than 1.96.

Table 3. 21: Entrepreneurship Training Multi-group analysis

Direct Effect						
	<i>Ent. Education Path Coef.</i>	<i>Ent. Education p Values</i>	<i>Ent. Education C.R.</i>	<i>No Ent. Education Path Coef.</i>	<i>No Ent. Education p Values</i>	<i>No Ent. Education C.R.</i>
PK → OR	.27***	.009	2.603	.29***	.001	3.718
PK → EA	.75***	.001	6.466	.65***	.001	9.639
EA → OR	.33***	.001	5.767	.30***	.001	4.757
EA → EM	.29***	.003	3.001	.31***	.001	4.969
EM → OR	.14***	.001	3.589	.14***	.001	7.420
EM → EI	.16***	.001	7.171	.15***	.001	4.092
OR → EI	.80***	.001	10.240	.83***	.001	15.481
EI → EB	.52***	.001	8.257	.52***	.001	10.207

Note: *** indicates 1% level of significance.

The results also show that the effects of prior knowledge on entrepreneurial alertness ($\beta = 0.75, p < 0.001$), entrepreneurial alertness on opportunity recognition ($\beta = 0.33, p < 0.001$), and entrepreneurial motivation on entrepreneurial intention ($\beta = 0.16, p < 0.001$), have the strongest significant effects for the group of respondents with entrepreneurship education/training.

3.5.3. Discussion of Results

The purpose of this study was to examine which individual entrepreneurial characteristics impact on the entrepreneurial behavior among higher education students. Particularly, the main objective of the study was to investigate the role of prior knowledge, entrepreneurial alertness, and entrepreneurial motivation in the development of entrepreneurial behaviour in higher education students. The empirical results support all the hypothesized direct and indirect causal relationships.

Despite the existence of several studies that explore the effect of the different constructs on entrepreneurial intention, this is the first study investigating all these constructs in one single model. Furthermore, to the best of our knowledge, the present empirical study is the first to test the relationship of entrepreneurial motivation directly with opportunity recognition and entrepreneurial intention, and indirectly between entrepreneurial alertness and opportunity recognition, among students from Portuguese universities. The present study addresses such previously untested relationships by applying the SEM technique.

Each hypothesized relationship is discussed in the succeeding subsections. More precisely:

- 1) Prior knowledge has a positive impact on opportunity recognition among university students.
- 2) Prior knowledge has a positive impact on entrepreneurial alertness among university students.
- 3) Entrepreneurial alertness has a positive impact on opportunity recognition among university students.
- 3a) Entrepreneurial alertness mediates the relationship between prior knowledge and opportunity recognition among university students.
- 4) Entrepreneurial alertness has a positive impact on entrepreneurial motivation among university students.
- 5) Entrepreneurial motivation has a positive impact on opportunity recognition among university students.

- 5a) Entrepreneurial motivation mediates the relationship between entrepreneurial alertness and opportunity recognition among university students.
- 6) Entrepreneurial motivation has a positive impact on entrepreneurial intentions among university students.
- 7) Opportunity recognition has a positive impact on entrepreneurial intentions among university students.
- 7a) Opportunity recognition mediates the relationship between entrepreneurial motivation and entrepreneurial intention among university students.
- 8) Entrepreneurial intention has a positive impact on entrepreneurial behavior among university students.

3.5.3.1. The Relationship Between Prior Knowledge and Opportunity Recognition

This study found a positive and significant relationship between prior knowledge and opportunity recognition (i.e. Hypothesis 1), a result that is consistent with several previous studies. Although Ward (2004) argues that knowledge may play a paradoxical role as it can both increase and inhibit creativity, which in the latter case may reduce the ability to detect opportunities, George et al. (2016) explained that prior knowledge positively influences the opportunity recognition process. In the same vein, Marvel and Droege (2010) noted that the pattern of prior knowledge (tacit) is positively related to opportunity recognition in the context of technological entrepreneurship. Likewise, Ardichvili et al. (2003) stated that prior knowledge affects the opportunity recognition core process that leads to business formation. In addition, Li et al. (2015) examined the relationship between prior knowledge and opportunity recognition, concluding that the prior knowledge of entrepreneurial university students highly influenced their opportunity recognition.

Similarly, Nikraftar and Hosseini (2016) found that prior knowledge has a positive and significant effect on opportunity recognition in the tourism industry. Furthermore, Shepherd and DeTienne (2005a) showed that individuals' prior knowledge enhances the ability to recognize the strong connections between concepts, which in turn increases the ability to identify the entrepreneurial opportunity. Our findings are also in line with the results of Shane (2000) that prior knowledge better enables the entrepreneurs to recognize more opportunities in the technology field, and with those of Tang (2010) showing a positive association between prior knowledge and opportunity recognition among entrepreneurs in China.

Additionally, our findings suggest that the higher the prior knowledge the students have, the higher will be their ability to recognize the opportunity. Therefore, prior knowledge makes the students alert for recognizing opportunities as the individuals with higher prior knowledge and idiosyncratic information can more easily recognize opportunities (Shane, 2000).

Notwithstanding, the relationship between prior knowledge and opportunity recognition might differ according to individuals' socio-demographic characteristics. For example, Hisrich et al. (2017) indicate that experience can enrich entrepreneurs with skills, knowledge, and other capabilities to cope with different situations. In addition, Hisrich et al. (2017) also explained that along with managerial experience, entrepreneurial experience such as start-up process, decision making, developing entrepreneurial culture, managing capital, etc., are also important. For an entrepreneur, having previous experience is a good sign to start a new subsequent business (Davidsson & Honig, 2003).

3.5.3.2. The Relationship Between Prior Knowledge and Entrepreneurial Alertness

The result of the study show that prior knowledge also has a positive and significant relationship with entrepreneurial alertness (i.e. Hypothesis 2) within the hypothesized model. The result of prior knowledge towards entrepreneurial alertness is also consistent with other studies. For example, Nikraftar and Hosseini (2016) found that prior knowledge is an important predictor of individual entrepreneurial alertness. Moreover, Arentz et al. (2013) illustrated that prior knowledge enables the entrepreneurs to think in a more intuitive way, which is related to higher entrepreneurial alertness. In addition, Tang et al. (2012) indicated that prior knowledge is significantly and positively related to entrepreneurial alertness and, therefore, prior knowledge fosters the entrepreneur's ability in searching, associating the updated/new information and making decisions.

Although the prior knowledge about the market, customer serving, and customer problems (Shane, 2003) are disseminated broadly, only those entrepreneurs with higher alertness are able to scrutinize this knowledge in order to identify what is useful and what is not (Tang et al., 2012).

3.5.3.3. *The Relationship Between Entrepreneurial Alertness and Opportunity Recognition.*

The results reveal that entrepreneurial alertness has a positive and significant impact on opportunity recognition (i.e. Hypothesis 3). Moreover, entrepreneurial alertness also plays a mediating role between prior knowledge and opportunity recognition in the integrated model (i.e. Hypothesis 3a). Therefore, entrepreneurial alertness is positively driven by prior knowledge and has both a direct effect (see Table 3. 15) and an indirect effect (see Table 3. 16) on opportunity recognition. These results are aligned and consistent with other studies. For example, Nikraftar and Hosseini (2016) noted that entrepreneurial alertness is considered as an antecedent of opportunity recognition in the tourism industry. In addition, the authors also illustrated the effect of prior knowledge on opportunity recognition while considering entrepreneurial alertness as a mediator. Similarly, Ardichvili and Cardozo (2000) indicated that entrepreneurial alertness among entrepreneurs has a positive and significant impact during the process of opportunity recognition. Also, Li et al. (2015) reported that entrepreneurial alertness directly influence opportunity recognition. Thus, students that are more “entrepreneurial alert” possess a higher capacity to recognize opportunities. In other words, entrepreneurial alertness seems to foster the individuals’ cognitive ability in identifying or detecting new opportunities in a competitive market.

In fact, the multi-group analysis in our study shows that the group of students that were enrolled in entrepreneurship education and training were more alert and abler to detect opportunities. In this case, the students acquired the knowledge through classes and in harmony with the internal environment of their educational institutions, as well as through colleagues and events. Prior knowledge helps the individual’s mind to interpret the external world/environment (Fiske & Taylor, 2013; Tang, 2009), which makes them more alert to opportunities in the external environment, and *vice versa*. Thus, these students develop a sense of entrepreneurial alertness driven from prior knowledge as a part of the entrepreneurial process, then becoming better positioned to recognise entrepreneurial opportunities.

According to Gaglio and Katz (2001), entrepreneurs possess a schema of entrepreneurial alertness, which is a mental model that represents an individual’s knowledge about the presence of market disruptions or their potential occurrence. This state of alertness, as schema, includes the proactive stances based on several cognitive capacities such as information processing skills, social interaction, prior knowledge and information, pattern recognition (Ardichvili et al., 2003;

Baron, 2006; Gaglio & Katz, 2001; Shane, 2003), and has a strong, consistent theoretical support (Lim & Xavier, 2015). The alert entrepreneurs who notice the relevant changes in the external environment (production and market changes) lead to the potential opportunity exploitation (Valliere, 2013). The literature, therefore, suggests that it is this schema that enables the students to integrate and process the information and develop the social liaisons to facilitate the opportunity recognition process, and the results of our multi-group analysis support the robustness of the positive impact of entrepreneurial alertness on opportunity recognition, especially in the case of the group of students that had entrepreneurship education. Finally, it was observed that female students show lower entrepreneurial alertness and ability to recognise opportunities. This results may explain, at least in part, why women are less entrepreneurial than men, since there are differences in the ability to recognise opportunity between men and women. According to DeTienne and Chandler (2007), men and women use fundamentally different processes of opportunity identification. However, these researchers found that there is no difference in their ability to recognize opportunities. Contrary to their results, we find that women have a lower entrepreneurial alertness, which may influence their ability to detect opportunities.

3.5.3.4. The Relationship Between Entrepreneurial Alertness and Entrepreneurial Motivation

The results reveal that entrepreneurial alertness also has a positive and significant relationship with entrepreneurial motivation (i.e. Hypothesis 4), as shown in Table 3. 15. These results are also consistent with other studies. For example, Troise and Tani (2020) collected data from the overall population of the Italian Equity Crowdfunding (ECF) platform and observed that entrepreneurial alertness has a significant impact on entrepreneurial motivation. In turn, entrepreneurial motivation among the students has a significant role in opportunity recognition. In other words, one can argue that if students are entrepreneurially alert but not entrepreneurially motivated, then they will not recognize the opportunity which could actually lead towards a new venture formation. Hence, entrepreneurial motivation plays a significant role in the entrepreneurial process (Birendra et al., 2019).

Traditionally, the main goal for creating a new venture is associated with economic gains and these gains behave like the primary motivation for entrepreneurs. In our study, we found that entrepreneurially alert students are more associated with entrepreneurial motivation in

recognizing opportunity and start-up behaviors. Nevertheless, Elfving (2009) stated that motivations can change, thus affecting not only the decision to become an entrepreneur, but also the perceptions of being an entrepreneur.

3.5.3.5. The Relationship Between Entrepreneurial Motivation and Opportunity Recognition

The construct of entrepreneurial motivation shows a positive and significant relationship with opportunity recognition among the students (i.e. Hypothesis 5) in our sample. Moreover, entrepreneurial motivation also has a significant mediation effect (indirect) between entrepreneurial alertness and opportunity recognition (i.e. Hypothesis 5a) as shown in Table 3.16. This means that motivation strengthens the relationship between entrepreneurial alertness and opportunity recognition. The statistically significant relationship between entrepreneurial motivation and opportunity recognition is consistent with several other studies. For example, Shepherd and Patzelt (2018b) highlighted the impact of motivation on entrepreneurs' identification and successful opportunity exploitation. The authors explained that irrespective of their capabilities, individuals' motivation is required for exploitation of opportunities because the exploitation of opportunities presents an important strategic action (Shepherd et al., 2017). Likewise, Santos and García (2011) explained that entrepreneurial motivation is closely linked with the exploitation of international entrepreneurial opportunities.

Essentially, these studies indicate that students who have a higher entrepreneurial motivation are better able to recognize and exploit an opportunity. At its core, the basic motivation for every individual in a wide range of domains is to achieve success and avoid failure (Carsrud et al., 2017). In the present context, however, Higgins' Regulatory Focus Theory (RFT) (Higgins, 1998) may be used to further discuss entrepreneurial motivation. According to this theory, students' motivations to seek entrepreneurial success are twofold: first, the promotion focus (PMF), and second, the prevention focus (PVF). Students are entrepreneurially motivated either by the promotion focus or the prevention focus. The students who are entrepreneurially motivated by PMF are more concerned about progress, ultimate success, and protect themselves from decision errors as explained by Tseng and Kang (2008). On the other hand, the students who are entrepreneurially motivated by PVF are more concerned about their safeguard, stability, being right in avoiding errors, and strongly committed to their obligations. Thus, the former group of students tend to be hopeful and aspiration oriented, willing to assume risks, and open to

accept changes, while the latter group of students tend to be more oriented towards their obligations. While these two approaches are thought as required for success, it is the PMF entrepreneurs who reveal more willingness to recognize and exploit the opportunities (Santos & García, 2011). This discussion suggests, therefore, that PMF is the primary source for the significant impact of entrepreneurial motivation on opportunity recognition, driving the students to recognize an existing or overlooked opportunity, a finding that is statistically significant across the sub-groups under examination in our multi-group analysis.

3.5.3.6. The Relationship Between Entrepreneurial Motivation and Entrepreneurial Intention

The results of the study showed that entrepreneurial motivation has a positive and significant relationship with entrepreneurial intention (i.e. Hypothesis 6) in the hypothesized model. Carsrud et al. (2017) highlight the fact that entrepreneurs do not necessarily possess motivations that are different from others, but rather how they use those motivations to help assess the eventual success or failure of their ventures. Therefore, to the best of our knowledge, the positive and statistically significant impact of entrepreneurial motivation on entrepreneurial intention was not previously reported in the literature, although several studies already pointed in this direction. For example, along with family support, entrepreneurial motivation is a driving force that leads towards entrepreneurial intentions in starting up a new business among Indian women (Goel & Madan, 2019). Furthermore, Chang et al. (2016) reported a positive and significant relationship between entrepreneurial intention and entrepreneurial motivation among college students.

Goel and Madan (2019) explained that entrepreneurial intention has emerged from the perception of desirability, feasibility, and propensity to work on an opportunity. According to the authors, the desirability is the attractiveness to new ventures, and feasibility is the capability of individuals, and propensity is the inner feeling of the entrepreneurs. Fitzsimmons and Douglas (2011) pointed out the combination of two forces that define entrepreneurial action; entrepreneurial desire and feasibility, which further bifurcated into further four subsections. According to them, first there is no entrepreneurial action (low desirability and feasibility), then natural entrepreneurial action (high desirability and feasibility), then accidental entrepreneurial action (low desirability and high feasibility) and inevitable entrepreneurial action (higher desirability and low feasibility). Nevertheless, Fitzsimmons and Douglas (2011) explained that the intention might not only be high with a set of high desirability and high feasibility but also for high-low and low-high combinations of desirability and feasibility.

The students can distinguish whether they are being filled with desirability, feasibility and propensity or whether they are likely to feel gratified to have more entrepreneurial motivation towards the entrepreneurial intention. This makes them likely to interpret their entrepreneurial intentions and to internalize the whole entrepreneurial process. Students' entrepreneurial motivation would, therefore, be integrated with their entrepreneurial intention. Thus, students with high entrepreneurial motivation devoted themselves to behave more entrepreneurially throughout the entrepreneurial process. We may conjecture that the students with low motivation may suffer a lack of entrepreneurial intention and behavior because they might think that they may not be properly equipped with the required skills needed to be a good entrepreneur. The role of entrepreneurship education is also very important in developing entrepreneurial motivation to get an intention for new business formulation. The students with entrepreneurship education were more motivated to present entrepreneurial intention in new start-ups, based on our results of the multi-group analysis.

3.5.3.7. The Relationship Between Opportunity Recognition and Entrepreneurial Intention

The results of the study also reveal that opportunity recognition is the most influential predictor of entrepreneurial intention. It shows that opportunity recognition has a positive and highly significant impact ($\beta = 0.840$, $p < 0.001$) on entrepreneurial intention in the proposed model (i.e. Hypothesis 7). In addition, opportunity recognition has a significant mediation effect (indirect) between entrepreneurial motivation and entrepreneurial intention (i.e. Hypothesis 7a). Therefore, opportunity recognition is positively driven by entrepreneurial motivation and found to have both a direct effect (see Table 3. 15) and an indirect effect (see Table 3. 16) on entrepreneurial intention. This implies that entrepreneurially motivated students are abler and possess more capabilities to recognize the opportunity that help them in developing the entrepreneurial intentions to initiate a new business.

These results are aligned with those of other scholars who stated that opportunity recognition/identification could be added as an additional variable to the Theory of Planned Behavior (TPB) to predict the individuals' intentions (Karimi et al., 2014). Furthermore, opportunity recognition is significantly related to intentions in the expected direction (Lars & Kolvereid, 2006). Moreover, opportunity recognition and entrepreneurial intentions are vital functions of the entrepreneurial process, and both must take place together for a new start-up (Reitan, 1997).

Opportunity recognition is a key factor that influence the feasibility of starting a new venture (Ardichvili et al., 2003). Therefore, opportunity recognition fuels the students to develop intentions to start a new business. Opportunity recognition raises entrepreneurial intention (Krueger et al., 2000) aimed at helping students to formulate the new venture and thereafter embrace all the technological and other changes created by the internal and external environment. In simple words, opportunity recognition is one of the drivers that leads the university students towards the start-ups. The opposite of the above statements may be true as well, that is, if the students are unable to identify the profitable opportunity, this may lead them not to develop entrepreneurial intention to start a new business.

Multi-group analysis also showed that in case of entrepreneurship education, the students without entrepreneurship education presented a higher effect of opportunity recognition on entrepreneurial intention ($\beta = 0.83$, $p < 0.001$) as compared to those students who have entrepreneurship education ($\beta = 0.80$, $p < 0.001$). This means that some factors, other than entrepreneurial education, also impact on the intention of starting a new business.

3.5.3.8. The Relationship Between Entrepreneurial Intention and Entrepreneurial Behavior

Finally, the construct of entrepreneurial intention shows a positive, direct and significant impact on entrepreneurial behavior (H_8 : $\beta = 0.537$, $p < 0.001$). The results indicate that entrepreneurial intention is a significant predictor of entrepreneurial behaviour, a finding that is consistent with other studies. For example, Armitage and Conner (2001) concluded in a meta-analysis review that intentions explained 27% of the variation in behavior. Moreover, Sheeran (2002) reported in another meta-analysis that intention explained, on average, 28% of the variation in future behavior. In addition, Gelderen et al. (2015) reported a positive relationship between entrepreneurial intention and entrepreneurial action among the Finish adult population. Also, active and potential entrepreneurs can get inspiration, ideas to strengthen their entrepreneurial intention, which turns into successful behaviors (Liñán & Fayolle, 2015). Entrepreneurial opportunity is a driving force for intention toward entrepreneurship that leads to start-up behavior (Yasir et al., 2017).

Our findings are also consistent with the Theory of Planned Behavior-TPB (Ajzen, 1991) that helps to understand the psychological process generated as a result of entrepreneurial intention to develop the behavior among the students. The concept of student's adherence to entrepreneurial

behavior in the perspective of the TPB explains that when students identify their behavioral intention, they have a higher level of readiness to perform that specific behavior. Neneh (2019) also mentioned that entrepreneurial intention is considered an important step towards new venture formation.

Thus, the entrepreneurial intention is a strong predictor of entrepreneurial behavior. Likewise, Kautonen et al. (2013) explained that entrepreneurial intention is positively related to subsequent entrepreneurial behavior. However, not all entrepreneurial intentions are always translated into actual behavior due to some contingency factors (Neneh, 2019). The aspiration among the students helps them in building entrepreneurial intention, which ultimately ends up with successful start-ups. So, the intentionally based entrepreneurship model comes up with good ground for the business start-up (Krueger et al., 2000).

While some studies have reported a negative relationship between entrepreneurial intention and entrepreneurial behaviour (Bae et al., 2014; Martin et al., 2013), the results of our multi-group analysis showed that students with entrepreneurship education presented higher entrepreneurial intentions to develop entrepreneurial behavior ($\beta = 0.57$, $p < 0.001$) as compared to those students with no entrepreneurship education ($\beta = 0.48$, $p < 0.001$).

3.6. Conclusion

The purpose of this study was to examine which individual entrepreneurial characteristics impact on the entrepreneurial behavior among higher education students. More specifically, the study aimed at the understanding of the concept in three different ways. First, examine the conceptual approaches of entrepreneurial alertness research and how this concept evolved in the literature over time. Second, investigate how prior knowledge, entrepreneurial alertness and entrepreneurial motivation shape opportunity recognition and entrepreneurial intentions and behaviour in the case of Portuguese higher education students. Third, examine how demographic variables like gender and entrepreneurship training can affect the relationship between entrepreneurial alertness, opportunity recognition, prior knowledge, entrepreneurial motivation, entrepreneurial intention, and entrepreneurial behaviour among higher education students.

Findings suggest that entrepreneurial alertness, prior knowledge and entrepreneurial motivation are the antecedents of opportunities recognition. These antecedents not only play a significant role in opportunity recognition, but also complement each other, adding strength to the efficacy of individual factors impacting opportunity recognition. Previous literature also found some kind

of positive relationship among prior knowledge, entrepreneurial alertness and opportunity recognition. For example, Arentz et al. (2013) and Li et al. (2015) studied the relationship between prior knowledge, entrepreneurial alertness and opportunity recognition among university students, and found a positive and significant relationship between them. In the same vein, Nikraftar and Hosseini (2016) concluded that prior knowledge positively influence entrepreneurial alertness, and that entrepreneurial alertness significantly contributed to opportunity recognition. Also, Troise and Tani (2020), focusing on entrepreneurial organizations, found that entrepreneurial alertness has a significant impact on entrepreneurial motivation. The present findings, however, have also uncovered that entrepreneurial alertness has a stronger direct impact on opportunity recognition in comparison with its indirect impact through entrepreneurial motivation. In addition, Purwana and Suhud (2018), and Tung et al. (2020) found that entrepreneurial motivation positively influenced the entrepreneurial intention of students. Similarly, Hassan et al. (2020) and Shinnar et al. (2018) concluded that opportunity recognition has a positive impact on entrepreneurial intention, and entrepreneurial intention has a positive impact on entrepreneurial behavior. The results of the current study are very similar to those reported in the previous literature, suggesting that entrepreneurial motivation positively influences opportunity recognition and entrepreneurial intention. Likewise, opportunity recognition has a significant impact on entrepreneurial intentions, which in turn positively influence the entrepreneurial behavior among the higher education students. The empirical support of all the direct hypotheses developed in the conceptual framework also established the mediation effects among the studied variables.

Moreover, the results of the multi-group invariance analysis have shown the equivalence of the proposed mediation model for both male and female students. Wannamakok and Chang (2020) argued that women have a higher capability to identify business opportunities than men. However, the multi-group analysis of the present study indicates that female students show lower entrepreneurial alertness and opportunity recognition than their male counterparts, thus contradicting the results obtained by previous researchers. In addition, the male students show higher entrepreneurial intention than the female students, thus warrant the results obtained by (Lo et al., 2012). These results could be due to the fact that, following gender stereotypes, females tend to self-impose as well as allow others to inflict hindrance to turn themselves into entrepreneurs, thus lowering their entrepreneurial intentions (Langowitz & Minniti, 2007). These

results are relevant to design better tools and initiatives e.g. workshops, trainings, skill-based learning etc. aimed at promoting female entrepreneurship, since it highlights the skills that need to be worked on to unlock women's full entrepreneurial potential.

In the same vein, our findings have shown that students with an enrolment in entrepreneurship education display significantly higher ability to detect opportunities, as well as higher entrepreneurial intention and behaviour than students with no training in entrepreneurship. Thus, students enrolled in entrepreneurship education have been found more alert in opportunity recognition process and have revealed more entrepreneurial intention to start a new business as compared to those students with no entrepreneurship education. These results contradict those obtained in previous studies which have found that entrepreneurship education has a negative impact on entrepreneurial intentions and behaviour (Nowiński et al., 2019). Moreover, our results refute the results obtained by Kim et al. (2020) who measured the impact of entrepreneurship education in high school students and observed that the scores of opportunity discovery and entrepreneurial intention were almost equal, or even lower, than those of the control group. These conflicting results, however, may be due to the different teaching methods used that may favour the development of specific skills over others.

Chapter IV

General Conclusion, Implication, Limitation and Future Research

4 General Conclusion, Implications, Limitations and Future Research

4.1 General Conclusion

Due to its relevance to economic and social development, the promotion of entrepreneurship in society has received considerable attention from both academics and policy makers in the last decades. In fact, a number of public policies have been implemented in developed and developing countries aiming at fostering entrepreneurship. The development of the right set of entrepreneurial competences, on the one hand, and the promotion of entrepreneurship education, on the other hand, have been considered essential in the development of entrepreneurial ventures. However, according to Cope and Pittaway (2007), it is still unclear to what extent entrepreneurship education makes students effective entrepreneurs. In this sense, it is important to understand how to promote the development of entrepreneurial ventures among students. Thus, the present study had as its main objective to investigate the antecedents of entrepreneurial behaviour among higher education students, and how those are affected by gender and entrepreneurship education.

Initially, this study focused on the evolution of entrepreneurial alertness research since the seminal work of Kirzner in 1973. Through the content analysis of the scientific literature, this study uncovered five main research trends where entrepreneurial alertness is considered an element of the market process (2000-2004), a perceptual variable that influences an individual's decision to become an entrepreneur (2005-2008), a dynamic capability of both entrepreneurs and employees (2009-2011), a skill that can be developed through education (2012-2017), and a factor that influences a firm's performance and a source of competitive advantage (2018-2019).

Then this study progressed towards a more profound appreciation of how the perception of alertness among university students is translated into entrepreneurial behaviour, since it is highlighted in the literature that students are an important source of nascent entrepreneurship (Ambad & Damit, 2016). More specifically, the study focused on understanding how prior knowledge, entrepreneurial alertness and entrepreneurial motivation shape opportunity recognition and entrepreneurial intentions and behaviour among university students, also taking into account the influence of gender. Moreover, the role of entrepreneurship education in the development of entrepreneurial competences was also explored.

In addition, this study examined the relevant constructs and their interplay in a Portuguese setting. Given that the specific academic environment may play a role in this context, three different universities located in the Centre and North regions of Portugal were selected as the main/specific sites for the current work. Data were gathered through a self-administrated survey from 1290 students (a valid data set) of the University of Aveiro, University of Porto, and University of Coimbra. The gathered data was then analyzed through structural equation modelling using the AMOS-24 software.

While recognizing that many factors influence the opportunity recognition process, the empirical findings of the present study provide evidence that prior knowledge, and entrepreneurial alertness have a positive impact on opportunity recognition. Therefore, the promotion of successful ventures is dependent on how students recognize existing or overlooked opportunities. As opportunity recognition is a complex and dynamic process, the students develop/enhance a deep understanding of their cognitive skills and schema, i.e. entrepreneurial alertness, under university guidance to make a proper entrepreneurial decision to recognize the opportunity. In addition, entrepreneurial alertness positively influences the entrepreneurial motivation among higher education students. In the same vein, entrepreneurial motivation also positively influences the opportunity recognition and the entrepreneurial intention. Thus, an important conclusion is that entrepreneurial alert and motivated students possess more capacity to recognize the opportunity. In other words, opportunity recognition happens when students improve their level of motivation, prior knowledge and entrepreneurial alertness. Likewise, entrepreneurial motivation has a significant impact on entrepreneurial intention. Thus, motivation also significantly boost the level of intention among the university student. Entrepreneurial motivation leads towards entrepreneurial intentions (Goel & Madan, 2019) and, hence, entrepreneurial motivation is a driving force among the students, that drives their entrepreneurial intentions towards performing a real entrepreneurial act. Moreover, opportunity recognition has a significant impact on entrepreneurial intentions which, in turn, positively influence the entrepreneurial behavior among the Portuguese higher education students. Therefore, another important conclusion is that the alert students with higher entrepreneurial motivation are not only more concerned with recognizing the opportunity, but also develop an intentional-behavior about starting up new ventures.

The results of the multi-group analysis showed that students enrolled in entrepreneurship education are better able to recognize opportunities by being alert, and to express higher entrepreneurial motivations and intentions, leading to a superior entrepreneurial behaviour when compared to students without entrepreneurship education. Thus, another key conclusion is that, the promotion of entrepreneurship education is more pressing and leads the higher education students to develop a superior entrepreneurial behavior. Moreover, by comparing the responses of female and male students, the results indicate that female students show lower entrepreneurial alertness and opportunity recognition capacity when compared to their male counterparts.

The reason behind the result is that under the impact of gender stereotypes, females tend to self-impose and allow others to impose some barriers to turn themselves into entrepreneurship, thereby lowering their entrepreneurship intentions (Langowitz & Minniti, 2007). These results are compatible to promote female entrepreneurship by designing better tools and initiatives since they emphasize the abilities and skills that need to be developed in order to fully realize women's entrepreneurial potential.

As previously noted, the relevance of these findings rests mainly on the novel methodological approach taken in this study. First and foremost, these results stand in the context of a comprehensive conceptual model incorporating a large number of relevant constructs (as per previous literature) *simultaneously*, thereby allowing for interaction and dependence between them. Notwithstanding their contribution to the literature, the findings in previous studies (e.g. Arentz et al., 2013; Hajizadeh & Zali, 2016; Li et al., 2015; Nikraftar & Hosseini, 2016; Park et al., 2017) may be marred by their narrow focus on fewer constructs, a well-known source of bias if omitted constructs are correlated with those under examination. Thus, where coincident, our results confer further validation to previous findings in that they arise from a more complete model. As a consequence, through this comprehensive model, the present study not only adds more robust evidence concerning entrepreneurial behavior, but it also yields valuable and empirically credible insights into the complementary aspects of different constructs which ultimately impact entrepreneurial behavior. Second, this study produced data that contributes towards understanding of entrepreneurial competences and entrepreneurial behavior among higher education students across Portugal thereby providing a novel contribution to the field of entrepreneurial ecosystem.

4.2 Implications

The present study investigated the entrepreneurial process by examining the relationship among the constructs presented in the conceptual model, and its findings provide important theoretical and practical contributions to the existing body of knowledge in the entrepreneurship literature, as well as to practitioners. These contributions are summarized below.

4.2.1 Theoretical Implications

The present study adopts an innovative approach that investigates constructs like prior knowledge and entrepreneurial alertness as predictors of opportunity recognition, and entrepreneurial intention and behavior. Thus, the current study connects the concept of entrepreneurial alertness presented by Kirzner (1979) and the theory of planned behavior presented by Ajzen (1991).

In addition, and regarding the theoretical contribution of the study, the extant literature on mediation analysis and multi-group analysis in the field of entrepreneurship is somewhat limited using the applied constructs from academic entrepreneurship or university entrepreneurship. The current study incorporates the construct of entrepreneurial alertness towards the start-up behavior for the explanation of the entrepreneurial process phenomenon.

Moreover, inclusion of entrepreneurial motivation as a construct in the developed conceptual model also contributes to the entrepreneurship literature given that the study of entrepreneurial motivation towards opportunity recognition and entrepreneurial intention among the students is somewhat limited in the literature. While Shane et al. (2003) explained that human motivation influences the decisions of individuals to pursue the entrepreneurial opportunity, Carsrud and Brännback (2011) argued that the role of entrepreneurial motivation was ignored in the last decades. Thus, the incorporation of entrepreneurial motivation among the students augments the theoretical knowledge in the field of entrepreneurship in general and academic entrepreneurship in particular.

Furthermore, the current study integrates and synthesizes the body of knowledge from the academic entrepreneurship by showing the positive impact of entrepreneurial alertness on opportunity recognition via mediation of entrepreneurial motivation which, in turn, drives entrepreneurial behavior. These findings enhance our understanding of entrepreneurial intention by bringing alertness and opportunity recognition to the debate on student entrepreneurship.

Likewise, the present study validates the importance of entrepreneurship education among the nascent entrepreneurs (for both male and female university students) in the entrepreneurial process for taking initiatives in starting a new business.

Finally, the theoretical conceptualization, analyses and findings in this study provide new understandings of several concepts associated with the entrepreneurial process, including some path relationships among different constructs in academic entrepreneurship, thereby holding promise for both methodological development, and questioning and refinement of the specific theoretical findings in the data relating to the work presented by Kirzner (1979) and the theory of planned behavior presented by Ajzen (1991).

4.2.2 Practical Implications

The primary practical implication of the current study is that entrepreneurial education and training is of utmost importance, particularly for university students. It is expected that this study will be valuable in attracting the attention of the top managers and policymakers at the university level, namely to design better programmes, and more aligned with the specificities of both male and female students, which will add to the entrepreneurial ecosystem for economic development. The findings of the present study recommend that an institutionalized training process of entrepreneurial activities should be implemented, and that students should be trained on how to get alert for opportunities and how they develop entrepreneurial behavior during their academic years via different seminars, workshops and course curriculum activities.

The second practical implication of the current study is that the findings are not only applicable to the academics, but the industry can also apply them in their environments. The findings may attract the attention of senior management towards the significance of the subject that entrepreneurially alert organizations are much attentive in opportunity recognition as compared to other organizations, allowing them to develop or maintain a competitive advantage. Additionally, the findings of the current study may be useful for them to initiate different training programs among their employees for the reinforcement of their intrinsic motivation in the process of organizational entrepreneurship.

The third practical implication of this study is that its findings may attract the attention of government officials and policymakers at the national level and may give valuable

recommendations on how the entrepreneurial activities among the students may contribute to the national economy as economic growth is strongly equated with the entrepreneurial process.

The fourth practical implication of the current study is that its findings may give direction to the students about their future choices. The students may manage their interests in developing their behavior based on their entrepreneurial intentions. The study findings are expected to encourage students to be more motivated for becoming entrepreneurs in their future choices.

4.3 Limitations of the study

The present study is significant as it focuses on student entrepreneurship and validates the proposed theoretical framework. Nonetheless, it has limitations that must be kept in mind when evaluating its findings.

First, the data were collected from three universities located in the North and Centre regions (Portugal). Thus, the results cannot be generalized to the entire population of Portuguese students. Second, the data were collected by convenient sampling, and responses from one thousand two hundred ninety (1290) university students was employed in this study. Thus, the generalization of the research is limited only to the sample being used. Third, another potential limitation of the study is the social bias response rate from university students. Although the anonymity of participants' responses was stressed at the beginning of the questionnaire, a number of students may respond to all questions positively to maintain their image. Fourth, because the data were collected from a single source (same respondent), the study may suffer from the so-called "common method variance" (CMV) problem. This problem arises when strong correlations among unrelated variables are falsely created due to respondents attempt to provide consistent answers to perceptual questions. The existence and severity of CMV is highly debated in the literature with some authors (e.g., Podsakoff et al., 2003) viewing it as a concern, and others (e.g. Spector (2006), Chan (2009), Conway and Lance (2010)) arguing that single-source self-reported questionnaire is quite suitable for data collection. Although respondents were informed that there were no right or wrong answers and they should answer truthfully, and they were assured of their anonymity, which are common ex ante design approaches to reduce the likelihood of the CMV problem, it cannot be entirely precluded.

Fifth, the study is limited to only one antecedent of entrepreneurial alertness, i.e. prior knowledge, as an independent/predictor variable. Although prior knowledge has been used and

empirically validated as a predictor of entrepreneurial alertness as in some previous literature (Ardichvili et al., 2003; Arentz et al., 2013; Nikraftar & Hosseini, 2016; Tang et al., 2012), several other scholars have used different conceptions and antecedents of this variable by using different dimensions due to the fact that there is no fixed definition of entrepreneurial alertness in the entrepreneurship literature.

Sixth, the present study validates the investigated topic of student entrepreneurship, but does not cover the role of the university. Naturally, however, the university is an essential stakeholder having an important impact in polishing students' cognitive capacities and capabilities.

4.4 Avenues for Future Research

This study has produced some findings and uncovered issues of interest that are worth considering and addressing in future research. First, this study was contained to a manageable sample of participants in order to guarantee the successful completion of the empirically oriented research process within the stipulated time frame. As noted in the previous section, this feature of the research design curtails the generalization of the study's findings to the Portuguese population of higher education students. Thus, future studies should aim at obtaining an enlarged and representative sample of students from other universities placed in different regions of Portugal so that the present findings could be tested, validated and generalized to the population it represents. Second, future research may also collect data from the students in other European Universities. Such research would not only allow testing the proposed conceptual model in culturally distinct groups thereby contributing to the field of intercultural entrepreneurship, but also provide a means to enrich the proposed model through the added cultural variety.

Third, and related to the study's limitations previously noted, future studies could consider using more objective measures in the evaluation of the opportunity recognition process so as to avoid social biases. It is recommended that social bias be prevented at the survey design stage, implementation and analysis phase. According to Nederhof (1985) the prevention method (i.e. self-awareness method or solitary self-administration method) and the detection method (i.e. Marlow-Crowne social desirability scale) may be reasonable solutions to the social response bias problem. Fourth, future research could consider using some other cognitive measures such as learning capabilities, dynamic environment, social network, self-efficacy, etc., in order to validate the underlying conceptual model. The reason for considering these other measures is to investigate whether these measures would impact the results concerning the opportunity

recognition process by students. Fifth, it is recognized that universities' support plays an essential role in determining students' attitudes towards entrepreneurial behavior (Feola et al., 2019) which also confirms the role of higher education institutions indirectly supporting entrepreneurial endeavours (Leydesdorff & Etzkowitz, 1996). Thus, one topic that deserves further investigation concerns the manner in which university rules, policies, and liaison with other institutions embed the students with different skills, capacities, and capabilities required for the entrepreneurial process.

A sixth area in which the present research could be taken further concerns the learning process of students towards entrepreneurship. This could be accomplished using a longitudinal data collection approach in which each student is repeatedly observed from their first-to-last academic year or using repeated cross-sectional surveys of first-to-last academic year groups of students.

References

- Abell, N., Springer, D. W., & Kamata, A. (2009). Developing and Validating Rapid Assessment Instruments. In *Developing and Validating Rapid Assessment Instruments*.
<https://doi.org/10.1093/acprof:oso/9780195333367.001.0001>
- Acs, Z. J., & Audretsch, D. B. (2010). *Handbook of Entrepreneurship Research: An interdisciplinary survey and introduction* (2nd ed.). New York: Springer.
<https://doi.org/10.1007/b102106>
- Adomako, S., Danso, A., Boso, N., & Narteh, B. (2018). Entrepreneurial alertness and new venture performance: Facilitating roles of networking capability. *International Small Business Journal: Researching Entrepreneurship*, 36(5), 453–472.
<https://doi.org/10.1177/0266242617747667>
- Adriaanse, L. S., & Rensleigh, C. (2013). Web of science, scopus and google scholar a content comprehensiveness comparison. *Electronic Library*, 31(6), 727–744.
<https://doi.org/10.1108/EL-12-2011-0174>
- Agarwal, R., & Selen, W. (2009). Dynamic capability building in service value networks for achieving service innovation. *Decision Sciences*, 40(3). <https://doi.org/10.1111/j.1540-5915.2009.00236.x>
- Ahmed, K., Adeel, A., Ali, R., & Rehman, R. U. (2019). Organizational democracy and employee outcomes: The mediating role of organizational justice. *Business Strategy and Development*, 2(3), 204–219. <https://doi.org/10.1002/bsd2.55>
- Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behavior. In J. Kuhl & J. Beckmann (Eds.) *Action Control: From cognition to behavior*. Springer-Verlag. (pp.11-39).
- Ajzen, I. (1991). The Theory of Planned Behavior Organizational Behavior and Human Decision Processes. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Aldrich, H., & Zimmer, C. (1986). Entrepreneurship through social networks. In Sexton, D.L., Smilor, R.W. (Eds.), *The Art and Science of Entrepreneurship* (pp. 3–23). Cambridge, MA: Ballinger.
- Almobaireek, W. N., & Manolova, T. S. (2013). Entrepreneurial Motivations Among Female University Youth in Saudi Arabia. *Journal of Business Economics and Management*, 14(Supplement_1), S56–S75. <https://doi.org/10.3846/16111699.2012.711364>

- Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*, 1(1–2), 11–26.
- Alvarez, S. A., & Barney, J. B. (2010). Entrepreneurship and Epistemology: The Philosophical Underpinnings of the Study of Entrepreneurial Opportunities. *Academy of Management Annals*, 4(1), 557–583. <https://doi.org/10.5465/19416520.2010.495521>
- Ambad, S. N. A., & Damit, D. H. D. A. (2016). Determinants of Entrepreneurial Intention Among Undergraduate Students in Malaysia. *Procedia Economics and Finance*, 37, 108–114. [https://doi.org/10.1016/s2212-5671\(16\)30100-9](https://doi.org/10.1016/s2212-5671(16)30100-9)
- Antonacopoulou, E. P., Moldjord, C., Steiro, T. J., & Stokkeland, C. (2019). The New Learning Organisation: PART I – Institutional Reflexivity, High Agility Organising and Learning Leadership. *Learning Organization*, 26(3), 304–318. <https://doi.org/10.1108/TLO-10-2018-0159>
- Ardichvili, A., & Cardozo, R. (2000). A model of the entrepreneurial opportunity recognition process. *Journal of Enterprising Culture*, 8(2), 103–119.
- Ardichvili, A., Cardozo, R., & Ray, S. (2003). A theory of entrepreneurial opportunity identification and development. In *Journal of Business Venturing* (Vol. 18, Issue 1, pp. 105–123). [https://doi.org/10.1016/S0883-9026\(01\)00068-4](https://doi.org/10.1016/S0883-9026(01)00068-4)
- Arenius, P., & Minniti, M. (2005). Perceptual variables and nascent entrepreneurship. *Small Business Economics*, 24(3). <https://doi.org/10.1007/s11187-005-1984-x>
- Arentz, J., Sautet, F., & Storr, V. (2013). Prior-knowledge and opportunity identification. *Small Business Economics*, 41(2), 461–478. <https://doi.org/10.1007/s11187-012-9437-9>
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology*, 40(4), 471–499. <https://doi.org/10.1348/014466601164939>
- Arogundade, B. B. (2011). Entrepreneurship Education : An Imperative for Sustainable Development in Nigeria. *Journal of Emerging Trends in Educational Research and Policy Studies*, 2(1), 26–29.
- Bacigalupo, M., Kampylis, P., Punie, Y., & Van den Brande, G. (2016). EntreComp : the Entrepreneurship Competence Framework. *Publication Office of the European Union, June*. <https://doi.org/10.2791/593884>
- Badri, R., & Hachicha, N. (2019). Entrepreneurship education and its impact on students’

- intention to start up: A sample case study of students from two Tunisian universities. *International Journal of Management Education*, 17(2), 182–190.
<https://doi.org/10.1016/j.ijme.2019.02.004>
- Bae, T. T. J., Qian, S., Miao, C., Fiet, J. J. O., & Bae, T.J., Qian, S., Miao, c., & Fiet, O. J. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. *Entrepreneurship Theory and Practice*, 38(2), 217–254.
<https://doi.org/http://dx.doi.org/10.1111/etap.12095>
- Barclay, D. W., Thompson, R., & Higgins, C. (1995). The Partial Least Squares (PLS) Approach to Causal Modeling : Personal Computer Use as an Illustration. *Technology Studies*, 2(2), 285–309.
- Baron, R. A. (1998). Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other people. *Journal of Business Venturing*, 13(4), 275–294.
[https://doi.org/10.1016/S0883-9026\(97\)00031-1](https://doi.org/10.1016/S0883-9026(97)00031-1)
- Baron, R. A. (2006). Opportunity recognition as pattern recognition: How entrepreneurs “connect the dots” to identify new business opportunities. In *Academy of Management Perspectives* (Vol. 20, Issue 1, pp. 104–119). <https://doi.org/10.5465/AMP.2006.19873412>
- Barr, P. S., & Shepherd, D. A. (2010). Cognitive Processes of Opportunity Recognition: The Role of Structural Alignment. *Organization Science*, 21(2), 413–431.
<https://doi.org/10.1287/orsc>.
- Bentler, P. M. (1980). Multivariate Analysis with Latent Variables: Causal Modeling. *Annual Review of Psychology*, 31(1), 419–456.
<https://doi.org/10.1146/annurev.ps.31.020180.002223>
- Bhattacharjee, A. (2012). *Social Science Research: Principles, Methods, and Practices*. Textbooks Collection. 3.
- Birendra, K., Duarte, M., Jordan, S., Peterson, M. N., & Erin, S. (2019). Using Social Network Analysis to Understand Trust, Reciprocity, and Togetherness in Wildlife Tourism Microentrepreneurship. *Journal of Hospitality and Tourism Research*, 43(8), 1176–1198.
<https://doi.org/10.1177/1096348019840794>
- Blaikie, N. (2007). Approaches to Social Enquiry: Advancing Knowledge. In *Contemporary Sociology* (Issue 2).
- Bollen, K., & Lennox, R. (1991). Conventional Wisdom on Measurement: A Structural Equation

- Perspective. *Psychological Bulletin*, 110(2), 305–314. <https://doi.org/10.1037/0033-2909.110.2.305>
- Botha, M., & Taljaard, A. (2019). The bidirectional relationship between entrepreneurial intention and entrepreneurial competencies for nascent and existing entrepreneurs. *South African Journal of Economic and Management Sciences*, 22(1). <https://doi.org/10.4102/sajems.v22i1.2230>
- Boudreaux, C. J., Nikolaev, B. N., & Klein, P. (2019). Socio-cognitive traits and entrepreneurship: The moderating role of economic institutions. *Journal of Business Venturing*, 34(1), 178–196. <https://doi.org/10.1016/j.jbusvent.2018.08.003>
- Boyd, N. G., & Vozikis, G. S. (1994). The Influence of Self-Efficacy on the Development of Entrepreneurial Intentions and Actions. *Entrepreneurship Theory and Practice*, 18(4), 63–77. <https://doi.org/10.1177/104225879401800404>
- Brockhaus, R. H., Hills, G. E., Klandt, H., & Welch, H. P. (2001). *Entrepreneurship Education: A Global View*. Ashgate Publishing Ltd, Aldershot, pp.57-77.
- Brown, T. (2014). *Confirmatory factor analysis for applied research* (2nd ed.). The Guilford Press.
- Bryman, A. (2012). *Social Research Methods, 4th edition*. Oxford university press.
- Bryman, A., & Cramer, D. (2005). *Quantitative Data Analysis With SPSS 12 and 13: A Guide for Social Sciences*. London & New York: Routledge: Taylor and Francis Group.
- Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS, and SIMPLIS : basic concepts, applications, and programming*. L. Erlbaum Associates.
- Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin*, 105(3), 456–466. <https://doi.org/10.1037//0033-2909.105.3.456>
- Carsrud, A., & Brännback, M. (2011). Entrepreneurial Motivations: What Do We Still Need to Know? *Journal of Small Business Management*, 49(1), 9–26. <https://doi.org/10.1111/j.1540-627X.2010.00312.x>
- Carsrud, A., Brännback, M., Elfving, J., & Brandt, K. (2017). Motivations: The Entrepreneurial Mind and Behavior, in Brannback , M. and Carsrud, A. (Eds). In *Revisiting the Entrepreneurial Mind*,. Springer International Publishing, Heidelberg, pp. 185-209. https://doi.org/10.1007/978-1-4419-0443-0_7

- Cassell, C., & Symon, G. (2004). Promoting New Research Practices in Organizational Research. In *Essential Guide to Qualitative Methods in Organizational Research*. SAGE Publications Ltd. <https://doi.org/10.4135/9781446280119.n1>
- Chan, D. (2009). Are self-report data really that bad? In *In C. E. Lance & R. J. Vandenberg (Eds.), Statistical and Methodological Myths and Urban legends: Doctrine, verity and fable in the organizational and social sciences (pp. 311-338)*.
- Chang, J. C., Sui, F. M., Hsiao, H. C., & Chiang, P. Y. (2016). The important impact factors of entrepreneurial motivation for college students. *IEEE International Conference on Industrial Engineering and Engineering Management, 2016-Decem*, 1856–1860. <https://doi.org/10.1109/IEEM.2016.7798199>
- Chang, W.-L., Liu, W. G. H., & Chiang, S.-M. (2014). A study of the relationship between entrepreneurship courses and opportunity identification: An empirical survey. *Asia Pacific Management Review, 19*(1), 1–24. <https://doi.org/10.6126/APMR.2014.19.1.01>
- Chell, E. (2013). Review of Skill and the Entrepreneurial Process. *International Journal of Entrepreneurial Behaviour & Research, 19*(1), 6–31. <https://doi.org/http://dx.doi.org/10.1108/13552550010362741>
- Chen, H. K., & Yan, D. W. (2019). Interrelationships between influential factors and behavioral intention with regard to autonomous vehicles. *International Journal of Sustainable Transportation, 13*(7), 511–527. <https://doi.org/10.1080/15568318.2018.1488021>
- Cheung, G. W., & Lau, R. S. (2008). Testing mediation and suppression effects of latent variables: Bootstrapping with structural equation models. *Organizational Research Methods, 11*(2), 296–325. <https://doi.org/10.1177/1094428107300343>
- Cohen, J. (1988). Statistical power analysis for behavioural sciences. In *Hillsdale, NJ: Lawrence Earlbaum Associates*.
- Conway, J. M., & Lance, C. E. (2010). What reviewers should expect from authors regarding common method bias in organizational research. *Journal of Business and Psychology, 25*(3), 325–334. <https://doi.org/10.1007/s10869-010-9181-6>
- Cope, J. P., & Pittaway, L. a. (2007). Entrepreneurship education: a systematic review of the evidence. *International Small Business Journal, 25*(5), 479–510. <https://doi.org/10.1177/0266242607080656>
- Corbett, A. C. (2007). Learning asymmetries and the discovery of entrepreneurial opportunities.

- Journal of Business Venturing*, 22(1), 97–118.
<https://doi.org/10.1016/j.jbusvent.2005.10.001>
- Costa, J., Marôco, J., Pinto-Gouveia, J., & Ferreira, N. (2017). Depression and physical disability in chronic pain: The mediation role of emotional intelligence and acceptance. *Australian Journal of Psychology*, 69(3), 167–177. <https://doi.org/10.1111/ajpy.12131>
- Craig, J. B. L., & Johnson, D. (2006). Establishing individual differences related to opportunity alertness and innovation dependent on academic-career training. *Journal of Management Development*, 25(1). <https://doi.org/10.1108/02621710610637945>
- Creswell, J. (1998). *“Qualitative Inquiry and Research Design”. Choosing among Five Traditions*,. Sage Publication Inc.
- Creswell, J. (2009). *Research design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications Ltd.
- Dane, E., & Pratt, M. G. (2007). Exploring intuition and its role in managerial decision making. In *Academy of Management Review* (Vol. 32, Issue 1, pp. 33–54).
<https://doi.org/10.5465/AMR.2007.23463682>
- Daniel, A. D., & de Castro, V. R. (2017). Entrepreneurship Education: How to Measure the Impact on Nascent Entrepreneurs. In *Nascent Entrepreneurship and Successful New Venture Creation* (pp. 85–110). <https://doi.org/10.4018/978-1-5225-2936-1.ch004>
- Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, 18(3), 301–331.
[https://doi.org/10.1016/S0883-9026\(02\)00097-6](https://doi.org/10.1016/S0883-9026(02)00097-6)
- De Vita, L., Mari, M., & Poggesi, S. (2014). Women entrepreneurs in and from developing countries: Evidences from the literature. *European Management Journal*, 32(3), 451–460.
<https://doi.org/10.1016/j.emj.2013.07.009>
- Demsetz, H. (1983). The neglect of the entrepreneur. In *in Ronen, J. (Ed.), Entrepreneurship*. Lexington Books, Lexington, MA, pp.271-280.
- Detienne, D. R., & Chandler, G. N. (2004). Opportunity Identification and Its Role in the Entrepreneurial Classroom : A Pedagogical. *Academy of Management Learning and Education*, 3(3), 242–257.
- DeTienne, D. R., & Chandler, G. N. (2007). The role of gender in opportunity identification. *Entrepreneurship: Theory and Practice*, 31(3), 365–386. <https://doi.org/10.1111/j.1540->

6520.2007.00178.x

- Dimov, D. (2007). Beyond the single-person, single-insight attribution in understanding entrepreneurial opportunities. *Entrepreneurship: Theory and Practice*, 31(5), 713–731. <https://doi.org/10.1111/j.1540-6520.2007.00196.x>
- Doane, D. P., & Seward, L. E. (2011). Measuring Skewness: A Forgotten Statistic? *Journal of Statistics Education*, 19(2). <https://doi.org/10.1080/10691898.2011.11889611>
- Dodeen, H. M. (2003). Effectiveness of valid mean substitution in treating missing data in attitude assessment. *Assessment and Evaluation in Higher Education*, 28(5), 505–513. <https://doi.org/10.1080/02602930301674>
- Edelman, L., & Yli-Renko, H. (2010). The impact of environment and entrepreneurial perceptions on venture-creation efforts: Bridging the discovery and creation views of entrepreneurship. *Entrepreneurship: Theory and Practice*, 34(5), 833–856. <https://doi.org/10.1111/j.1540-6520.2010.00395.x>
- Elfving, J. (2009). *Contextualizing entrepreneurial intentions : a multiple case study on entrepreneurial cognition and perception*. <http://www.doria.fi/handle/10024/43823>
- European Commission. (2013). *Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Entrepreneurship 2020 Action Plan: Reigniting the entrepreneurial spirit in Europe*. <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0795:FIN:EN:PDF>
- European Commission. (2003). *Green Book on Entrepreneurship in Europe*.
- European Commission. (2019). *Promoting entrepreneurship*. https://ec.europa.eu/growth/smes/promoting-entrepreneurship_en
- Falagas, M. E., Pitsouni, E. I., Malietzis, G. A., & Pappas, G. (2008). Comparison of PubMed, Scopus, Web of Science, and Google Scholar: strengths and weaknesses. *The FASEB Journal*, 22(2), 338–342. <https://doi.org/10.1096/fj.07-9492lsf>
- Fayolle, A., Liñán, F., & Moriano, J. A. (2014). Beyond entrepreneurial intentions: values and motivations in entrepreneurship. *International Entrepreneurship and Management Journal*, 10(4), 679–689. <https://doi.org/10.1007/s11365-014-0306-7>
- Feola, R., Vesci, M., Botti, A., & Parente, R. (2019). The Determinants of Entrepreneurial Intention of Young Researchers: Combining the Theory of Planned Behavior with the

- Triple Helix Model. *Journal of Small Business Management*, 57(4), 1424–1443.
<https://doi.org/10.1111/jsbm.12361>
- Fiet, J.O., & Patel, P. C. (2008). Entrepreneurial discovery as constrained, systematic search. *Small Business Economics*, 30(3). <https://doi.org/10.1007/s11187-006-9010-5>
- Fiet, James O. (2007). A prescriptive analysis of search and discovery. *Journal of Management Studies*, 44(4), 592–611. <https://doi.org/10.1111/j.1467-6486.2006.00671.x>
- Finney, S. J., & DiStefano, C. (2013). “Non-normal and categorical data in structural equation modeling.” In *Structural Equation Modeling: a second course*, eds G. R. Hancock, and R. O. Mueller, (Charlotte, NC: Information Age Publishing) (Issue 9, pp. 439–492).
- Fischer, A. (2011). Recognizing opportunities: Initiating service innovation in PSFs. *Journal of Knowledge Management*, 15(6), 915–927. <https://doi.org/10.1108/13673271111179280>
- Fishbein, M. (1980). A theory of reasoned action: some applications and implications. *Nebraska Symposium on Motivation. Nebraska Symposium on Motivation*, 27, 65–116.
- Fiske, S., & Taylor, S. (2013). *Social cognition: From brains to culture*. Sage, London.
- Fitzsimmons, J. R., & Douglas, E. J. (2011). Interaction between feasibility and desirability in the formation of entrepreneurial intentions. *Journal of Business Venturing*, 26(4), 431–440.
<https://doi.org/10.1016/j.jbusvent.2010.01.001>
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39–50.
<https://doi.org/10.1177/002224378101800104>
- Frederick, HH. Kuratko, D. (2010). *Entrepreneurship : theory, process, practice* (2nd Asia-P). South Melbourne, Victoria : Cengage Learning Australia,.
- Gaertner, K. N., & Nollen, S. D. (1989). Career Experiences, Perceptions of Employment Practices, and Psychological Commitment to the Organization. *Human Relations*, 42(11), 975–991. <https://doi.org/10.1177/001872678904201102>
- Gaglio, C. M., & Katz, J. A. (2001). The Psychological Basis of Opportunity Identification: Entrepreneurial Alertness. *Small Business Economics*, 16(2), 95–111.
<https://doi.org/10.1023/A:1011132102464>
- García-Cabrera, A. M., & García-Soto, M. G. (2009). A dynamic model of technology-based opportunity recognition. *Journal of Entrepreneurship*, 18(2), 167–190.
<https://doi.org/10.1177/097135570901800202>

- García, J., González, T., & García, A. (2011). The entrepreneur from a cognitive approach. *Psicothema*, 23(3), 433–438. <http://dialnet.unirioja.es/servlet/articulo?codigo=3687141>
- Gefen, D., Rigdon, E. E., & Straub, D. (2011). An update and extension to SEM guidelines for administrative and social science research. In *MIS Quarterly: Management Information Systems* (Vol. 35, Issue 2). <https://doi.org/10.2307/23044042>
- Ghasemi, B., & Rowshan, A. (2016). Early warning: The role of market on entrepreneurial alertness. *Journal of Intelligence Studies in Business*, 6(2).
- Gill, J., & Johnson, P. (2010). *Research Methods for Managers*,. 4th edition, SAGE Publications Ltd.
- Global Entrepreneurship Monitor*. (2020). <https://www.gemconsortium.org/report/gem-2019-2020-global-report>
- Goel, N., & Madan, P. (2019). Benchmarking financial inclusion for women entrepreneurship – a study of Uttarakhand state of India. *Benchmarking*. <https://doi.org/10.1108/BIJ-01-2018-0023>
- Granados, M. L., Hlupic, V., Coakes, E., & Mohamed, S. (2011). Social enterprise and social entrepreneurship research and theory. *Social Enterprise Journal*, 7(3), 198–218. <https://doi.org/10.1108/17508611111182368>
- Gundry, L. K., Ofstein, L. F., & Kickul, J. R. (2014). Seeing around corners: How creativity skills in entrepreneurship education influence innovation in business. *International Journal of Management Education*, 12(3), 529–538. <https://doi.org/10.1016/j.ijme.2014.03.002>
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*. Prentice Hall.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2015). *Multivariate Data Analysis*.
- Hair, J. F., Hult, G., Ringle, C., & Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. SAGE Publications Ltd.
- Hair, J. F., Hult, G., Ringle, C., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (2nd Editio). Los Angeles: Thousand Oaks: Sage.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2012). Partial Least Squares: The Better Approach to Structural Equation Modeling? In *Long Range Planning* (Vol. 45, Issues 5–6, pp. 312–319).

<https://doi.org/10.1016/j.lrp.2012.09.011>

- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. In *Long Range Planning* (Vol. 46, Issues 1–2, pp. 1–12). <https://doi.org/10.1016/j.lrp.2013.01.001>
- Hajizadeh, A., & Zali, M. (2016). Prior knowledge, cognitive characteristics and opportunity recognition. *International Journal of Entrepreneurial Behaviour and Research*, 22(1), 63–83. <https://doi.org/10.1108/IJEER-05-2015-0110>
- Hannon, P. (2007). Enterprise for all? The fragility of enterprise provision across England's HEIs. *Journal of Small Business and Enterprise Development*, 14(2), 183–210. <https://doi.org/10.1108/14626000710746646>
- Hassan, A., Saleem, I., Anwar, I., & Hussain, S. A. (2020). Entrepreneurial intention of Indian university students: the role of opportunity recognition and entrepreneurship education. *Education and Training*. <https://doi.org/10.1108/ET-02-2020-0033>
- Hessels, J., Van Gelderen, M., & Thurik, R. (2008). Entrepreneurial aspirations, motivations, and their drivers. *Small Business Economics*, 31(3), 323–339. <https://doi.org/10.1007/s11187-008-9134-x>
- Higgins, E. T. (1998). Promotion and Prevention: Regulatory Focus as A Motivational Principle. *Advances in Experimental Social Psychology*, 30(1), 1–46. [https://doi.org/10.1016/S0065-2601\(08\)60381-0](https://doi.org/10.1016/S0065-2601(08)60381-0)
- Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceeding of National Academy of Science, USA*, 102(46), 16569–16572. <https://doi.org/10.1073/pnas.0507655102>
- Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2017). *Entrepreneurship* (10 edition). McGraw-Hill.
- Hoe, S. L. (2008). Issues and procedures in adopting structural equation modeling technique. *Journal of Applied Quantitative Methods*, 3(1), 76–83. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.497.1504&rep=rep1&type=pdf>
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, 6(1), 53–60. <http://arrow.dit.ie/cgi/viewcontent.cgi?article=1001&context=buschmanart>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis:

- Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55.
<https://doi.org/10.1080/10705519909540118>
- Hu, R., & Ye, Y. (2017). Do entrepreneurial alertness and self-efficacy predict Chinese sports major students' entrepreneurial intention? *Social Behavior and Personality*, 45(7).
<https://doi.org/10.2224/sbp.6356>
- Husin, N., Rahim, N. A., Mat, R. C., Kamal, M. H. M., & Ismail, I. (2016). Entrepreneurial Success Among Single Mothers: The Role of Motivation and Passion. *Procedia Economics and Finance*, 37, 121–128. [https://doi.org/10.1016/s2212-5671\(16\)30102-2](https://doi.org/10.1016/s2212-5671(16)30102-2)
- Jalambadani, Z., Borji, A., & Delkhosh, M. (2018). The effect of education based on the theory of planned behavior on iron supplementation among pregnant women. *Korean Journal of Family Medicine*, 39(6), 370–374. <https://doi.org/10.4082/kjfm.17.0141>
- Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, 30(2), 199–218. <https://doi.org/10.1086/376806>
- Jöreskog, K. G., & Sörbom, D. (1993). *LISREL 8: Structural equational modeling with the SIMPLIS Command Language*. Scientific software international.
- Juschten, M., Jiricka-Pürerer, A., Unbehaun, W., & Hössinger, R. (2019). The mountains are calling! An extended TPB model for understanding metropolitan residents' intentions to visit nearby alpine destinations in summer. *Tourism Management*, 75, 293–306.
<https://doi.org/10.1016/j.tourman.2019.05.014>
- Kah, S., O'Brien, S., Kok, S., & Gallagher, E. (2020). Entrepreneurial Motivations, Opportunities, and Challenges: An International Perspective. *Journal of African Business*.
<https://doi.org/10.1080/15228916.2020.1838835>
- Kaish, S., & Gilad, B. (1991). Characteristics of opportunities search of entrepreneurs versus executives: Sources, interests, general alertness. *Journal of Business Venturing*, 6(1), 45–61.
[https://doi.org/10.1016/0883-9026\(91\)90005-X](https://doi.org/10.1016/0883-9026(91)90005-X)
- Karimi, S., Biemans, H. J. A., Lans, T., Chizari, M., & Mulder, M. (2014). The Impact of Entrepreneurship Education: A Study of Iranian Students' Entrepreneurial Intentions and Opportunity Identification. *Journal of Small Business Management*, 54(1), 187–209.
<https://doi.org/10.1111/jsbm.12137>
- Katz, J. A. (2003). The chronology and intellectual trajectory of American entrepreneurship

- education 1876-1999. In *Journal of Business Venturing* (Vol. 18, Issue 2, pp. 283–300).
[https://doi.org/10.1016/S0883-9026\(02\)00098-8](https://doi.org/10.1016/S0883-9026(02)00098-8)
- Kautonen, T., van Gelderen, M., & Fink, M. (2015). Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions. *Entrepreneurship: Theory and Practice*, 39(3), 655–674. <https://doi.org/10.1111/etap.12056>
- Kautonen, T., van Gelderen, M., & Tornikoski Erno. (2013). Predicting entrepreneurial behaviour: a test of the theory of planned behaviour. *Applied Economics*, 45(6), 697–707. <https://doi.org/10.1080/00036846.2011.610750>
- Kim, G., Kim, D., Lee, W. J., & Joung, S. (2020). The Effect of Youth Entrepreneurship Education Programs: Two Large-Scale Experimental Studies. *SAGE Open*, 10(3), 1–21. <https://doi.org/10.1177/2158244020956976>
- Kirzner, I. M. (1973). *Competition and entrepreneurship*. University of Chicago Press.
- Kirzner, I. M. (1976). *The economic point of view: an essay in the history of economic thought* (2^o ed.). Sheed and Ward.
- Kirzner, I. M. (1979). *Perception, opportunity and profit: Studies in the Theory of Entrepreneurship*. University of Chicago Press.
- Kirzner, I. M. (1985). *Discovery and the capitalis process*. The University of Chhicago Press.
- Kirzner, I. M. (1992). The meaning of market process. In Mario J. Rizzo and Lawrence H. White (Ed.), *The Meaning of Market Process: Essays in the development of moden Austrian economics* (pp. 38–54). Routledge. <https://doi.org/10.4324/9780203004456>
- Kirzner, I. M. (1997). Entrepreneurial Discovery Process and the Competitive Market Process: An Austrian Approach. *Journal of Economic Literature*, 35(1), 60–85. <https://doi.org/10.2307/2729693>
- Kirzner, I. M. (1999). Creativity and/or alertness: A reconsideration of the Schumpeterian entrepreneur. *Review of Austrian Economics*, 11(1), 5–17. <https://doi.org/10.1023/A:1007719905868>
- Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling*. Guilford Publications.
- Kontinen, T., & Ojala, A. (2011). International Opportunity Recognition among Small and Medium-Sized Family Firms. *Journal of Small Business Management*, 49(3), 490–514. <https://doi.org/10.1111/j.1540-627X.2011.00326.x>

- Kraus, S., Niemand, T., Angelsberger, M., Mas-Tur, A., & Roig-Tierno, N. (2017). Antecedents of International Opportunity Recognition in Born Global Firms. *Journal of Promotion Management*, 23(3), 386–406. <https://doi.org/10.1080/10496491.2017.1294869>
- Krueger, N. F. (2000). The Cognitive Infrastructure of Opportunity Emergence. *Entrepreneurship: Theory and Practice*, 24(3), 5–23.
- Krueger, N. F., & Brazeal, D. V. (1994). Entrepreneurial Potential and Potential Entrepreneurs. *Entrepreneurship Theory and Practice*, 18(3), 91–104. <https://doi.org/10.1177/104225879401800307>
- Krueger, N. F., Reilly, M. D., & Carsrud, A. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5), 411–432. [https://doi.org/10.1016/S0883-9026\(98\)00033-0](https://doi.org/10.1016/S0883-9026(98)00033-0)
- Kumar, B., Manrai, A. K., & Manrai, L. A. (2017). Purchasing behaviour for environmentally sustainable products: A conceptual framework and empirical study. *Journal of Retailing and Consumer Services*, 34, 1–9. <https://doi.org/10.1016/j.jretconser.2016.09.004>
- Langowitz, N., & Minniti, M. (2007). The Entrepreneurial Propensity of Women. *Entrepreneurship Theory and Practice*, 31(3), 341–364.
- Lars, & Kolvereid, E. I. (2006). New business start-up and subsequent entry into self-employment. *Journal of Business Venturing*, 21(6), 866–885. <https://doi.org/10.1016/J.JBUSVENT.2005.06.008>
- Lee, M. C. (2009). Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. *Electronic Commerce Research and Applications*, 8(3), 130–141. <https://doi.org/10.1016/j.elerap.2008.11.006>
- Levie, J., & Autio, E. (2008). A theoretical grounding and test of the GEM model. *Small Business Economics*, 31(3), 235–263. <https://doi.org/10.1007/s11187-008-9136-8>
- Leydesdorff, L., & Etzkowitz, H. (1996). Emergence of a Triple Helix of university—industry—government relations. *Science and Public Policy*, 23(5), 279–286. <https://doi.org/10.1093/spp/23.5.279>
- Li, Y., Wang, P., & Liang, Y. J. (2015). Influence of entrepreneurial experience, alertness, and prior knowledge on opportunity recognition. *Social Behavior and Personality*, 43(9), 1575–1584. <https://doi.org/10.2224/sbp.2015.43.9.1575>
- Lim, W. L., Lean-ee, Y., & Ramasamy, R. (2014). Personality, prior knowledge, social capital,

- and entrepreneurial intentions: Entrepreneurial alertness as mediator. *Global Journal of Business and Social Science Review*, 2(1), 68–78.
- Lim, W., & Xavier, R. (2015). Opportunity Recognition Framework: Exploring the Technology Entrepreneurs. *American Journal of Economics*, 5(2), 105–111.
- Liñán, F. (2008). Skill and value perceptions: how do they affect entrepreneurial intentions? *International Entrepreneurship and Management Journal*, 4(3), 257–272.
- Linan, F., & Chen, Y. (2009). Development and Cross-Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions. *Entrepreneurship Theory and Practice*, 33(3), 593–617. <https://doi.org/10.1111/j.1540-6520.2009.00318.x>
- Liñán, Francisco. (2007). The role of entrepreneurship education in the entrepreneurial process. In *Handbook of Research in Entrepreneurship Education, Volume 1: A General Perspective* (pp. 230–247).
- Liñán, Francisco, & Fayolle, A. (2015). A systematic literature review on entrepreneurial intentions: citation, thematic analyses, and research agenda. *International Entrepreneurship and Management Journal*, 11(4), 907–933. <https://doi.org/10.1007/s11365-015-0356-5>
- Lo, C., Sun, H., & Law, K. (2012). Comparing the entrepreneurial intention between female and male engineering students. *JWEE*, 1–2, 28–51.
- Loewenthal, K. M. (1996). *An introduction to psychological tests and scales*. London: UCL Press.
- Ma, R., & Huang, Y. C. (2016). Opportunity-Based Strategic Orientation, Knowledge Acquisition, and Entrepreneurial Alertness: The Perspective of the Global Sourcing Suppliers in China. *Journal of Small Business Management*, 54(3), 953–972. <https://doi.org/10.1111/jsbm.12222>
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149. <https://doi.org/10.1037/1082-989X.1.2.130>
- MacKenzie, S. B., Podsakoff, P. M., & Jarvis, C. B. (2005). The problem of measurement model misspecification in behavioral and organizational research and some recommended solutions. In *Journal of Applied Psychology* (Vol. 90, Issue 4, pp. 710–730). <https://doi.org/10.1037/0021-9010.90.4.710>
- Magni, G., & Bilotta, F. (2016). Chapter 41 - Postoperative Cognitive Dysfunction. In H.

- Prabhakar (Ed.), *Complications in Neuroanesthesia* (pp. 411–427). Elsevier.
<https://linkinghub.elsevier.com/retrieve/pii/C20150008115>
- Mair, J., & Noboa, E. (2006). Social entrepreneurship: How intentions to create a social venture are formed. In *Social Entrepreneurship* (pp. 121–135).
<https://doi.org/10.1057/9780230625655>
- Marôco, J. (2010). *Análise de Equações Estruturais. Fundamentos teóricos, Software & Aplicações*. ReportNumber. Pêro Pinheiro.
- Martin, B. C., McNally, J. J., & Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28(2), 211–224. <https://doi.org/10.1016/j.jbusvent.2012.03.002>
- Martínez-López, F. J., Gázquez-Abad, J. C., & Sousa, C. M. P. (2013). Structural equation modelling in marketing and business research: Critical issues and practical recommendations. *European Journal of Marketing*, 47(1), 115–152.
<https://doi.org/10.1108/03090561311285484>
- Marvel, M. R., & Droege, S. (2010). Prior tacit knowledge and first-year sales: Learning from technology entrepreneurs. *Journal of Small Business and Enterprise Development*, 17(1), 32–44. <https://doi.org/10.1108/14626001011019116>
- Marvel, M. R., & Lumpkin, G. T. (2007). Technology entrepreneurs' human capital and its effects on innovation radicalness. *Entrepreneurship: Theory and Practice*, 31(6), 807–828.
<https://doi.org/10.1111/j.1540-6520.2007.00209.x>
- Mary George, N., Parida, V., Lahti, T., & Wincent, J. (2016). A systematic literature review of entrepreneurial opportunity recognition: insights on influencing factors. *International Entrepreneurship and Management Journal*, 12(2), 309–350.
<https://doi.org/10.1007/s11365-014-0347-y>
- Maryam, C., & Schøtt, T. (2015). Education and training benefiting a career as entrepreneur. *International Journal of Gender and Entrepreneurship*, 7(3), 321–343.
<https://doi.org/10.1108/IJGE-03-2013-0027>
- McDaniel, C., & Gates, R. (2006). *Marketing Research Essentials*. Hoboken, N.J: Wiley Publishing.
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. In *Academy of Management Review* (Vol. 31, Issue 1, pp.

- 132–152). <https://doi.org/10.5465/AMR.2006.19379628>
- Miao, Q., & Liu, L. (2010). A psychological model of entrepreneurial decision making. *Social Behavior and Personality: An International Journal*, *38*(3), 357–363.
<https://doi.org/10.2224/sbp.2010.38.3.357>
- Minniti, M. (2004). Entrepreneurial alertness and asymmetric information in a spin-glass model. *Journal of Business Venturing*, *19*(5), 637–658.
<https://doi.org/10.1016/j.jbusvent.2003.09.003>
- Mises, L. von. (1949). *Human Action*. Yale U. Press. <https://doi.org/10.1007/978-1-349-00879-7>
- Mitchell, R. K., Busenitz, L. W., Bird, B., Marie Gaglio, C., McMullen, J. S., Morse, E. A., & Smith, J. B. (2007). The central question in entrepreneurial cognition research 2007. *Entrepreneurship: Theory and Practice*, *31*(1), 1–27. <https://doi.org/10.1111/j.1540-6520.2007.00161.x>
- Murnieks, C. Y., Klotz, A. C., & Shepherd, D. A. (2019). Entrepreneurial motivation: A review of the literature and an agenda for future research. *Journal of Organizational Behavior*, *1*(29), 1–29. <https://doi.org/10.1002/job.2374>
- Nederhof, A. J. (1985). Methods of coping with social desirability bias: A review. *European Journal of Social Psychology*, *15*(3), 263–280. <https://doi.org/10.1002/ejsp.2420150303>
- Neneh, B. N. (2019). From entrepreneurial alertness to entrepreneurial behavior: The role of trait competitiveness and proactive personality. *Personality and Individual Differences*, *138*, 273–279. <https://doi.org/10.1016/j.paid.2018.10.020>
- Netemeyer, R. G., Burton, S., & Lichtenstein, D. R. (1995). Trait Aspects of Vanity: Measurement and Relevance to Consumer Behavior. *Journal of Consumer Research*, *21*(4), 612. <https://doi.org/10.1086/209422>
- Nikraftar, T., & Hosseini, E. (2016). Factors affecting entrepreneurial opportunities recognition in tourism small and medium sized enterprises. *Tourism Review*, *71*(1), 6–17.
<https://doi.org/10.1108/TR-09-2015-0042>
- Niu, L., Wang, Z., Fang, Y., Ip, M., & Lau, J. T. F. (2019). Behavior intention to use routine opt-out HIV testing in primary care settings among men who have sex with men in China. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, *31*(12), 1565–1573.
<https://doi.org/10.1080/09540121.2019.1612003>
- Norton, W. I., & Hale, D. H. (2011). Protocols for teaching students how to search for, discover,

- and evaluate innovations. *Journal of Management Education*, 35(6), 808–835.
<https://doi.org/10.1177/1052562911401234>
- Nowiński, W., Haddoud, M. Y., Lančarič, D., Egerová, D., & Czeglédi, C. (2019). The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, 44(2), 361–379. <https://doi.org/10.1080/03075079.2017.1365359>
- Nunnally, J. C. (1967). *Psychometric theory*. New York: McGraw Hill.
- Nwangwu, I. O. (2007). Higher education for selfreliance: An imperative for the Nigerian economy. *NEAP Publication*, 1–8.
- Obschonka, M., Hakkarainen, K., Lonka, K., & Salmela-Aro, K. (2017). Entrepreneurship as a twenty-first century skill: entrepreneurial alertness and intention in the transition to adulthood. *Small Business Economics*, 48(3), 487–501. <https://doi.org/10.1007/s11187-016-9798-6>
- Obschonka, M., Silbereisen, R. K., Cantner, U., & Goethner, M. (2015). Entrepreneurial Self-Identity: Predictors and Effects Within the Theory of Planned Behavior Framework. *Journal of Business and Psychology*, 30(4), 773–794. <https://doi.org/10.1007/s10869-014-9385-2>
- Oosterbeek, H., van Praag, M., & Ijsselstein, A. (2010). The impact of entrepreneurship education on entrepreneurship skills and motivation. *European Economic Review*, 54(3), 442–454. <https://doi.org/10.1016/j.euroecorev.2009.08.002>
- Ozgen, E. (2003). *Entrepreneurial opportunity recognition: information flow, social and cognitive perspectives* (Issue August 2003). dissertation, Rensselaer Polytechnic Institute, Troy, NY.
- Ozgen, E., & Baron, R. (2007). Social sources of information in opportunity recognition: Effects of mentors, industry. *Journal of Business Venturing*, 22(2), 174–192.
<http://linkinghub.elsevier.com/retrieve/pii/S0883902606000115>
- Park, J. Y., Sung, C. S., & Im, I. (2017). Does social media use influence entrepreneurial opportunity? A review of its moderating role. *Sustainability*, 9(9), 1–16.
<https://doi.org/10.3390/su9091593>
- Paul, J., Modi, A., & Patel, J. (2016). Predicting green product consumption using theory of planned behavior and reasoned action. *Journal of Retailing and Consumer Services*, 29,

- 123–134. <https://doi.org/10.1016/j.jretconser.2015.11.006>
- Pittway, L. (2008). Systematic literature reviews. In *The SAGE Dictionary of Qualitative Management Research*. Sage Publications. <https://doi.org/doi:10.4135/9780857020109>
- Podasakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.
- Purwana, D., & Suhud, U. (2018). Investigating the effect of motivation on entrepreneurial intention: Three different approaches. *Problems and Perspectives in Management, 16*(2), 200–208. [https://doi.org/10.21511/ppm.16\(2\).2018.18](https://doi.org/10.21511/ppm.16(2).2018.18)
- Putnick, D. ., & Bornstein, M. . (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review, 41*, 71–90.
- Quintal, V. A., Lee, J. A., & Soutar, G. N. (2010). Risk, uncertainty and the theory of planned behavior: A tourism example. *Tourism Management, 31*(6), 797–805.
<https://doi.org/10.1016/j.tourman.2009.08.006>
- Rametse, N., Moremong-Nganunu, T., Ding, M. J., & Arenius, P. (2018). Entrepreneurial Motivations and Capabilities of Migrant Entrepreneurs in Australia. *International Migration, 56*(4), 217–234. <https://doi.org/10.1111/imig.12452>
- Ranjit, K. (2005). “*Research Methodology: A Step-by-Step Guide for Beginners*,” 2nd edition,. Sage Publication Ltd.
- Reitan, B. (1997). *Entrepreneurial Potential and Its Antecedents: Theoretical and Emperical Evidence*. Unpublished manuscript, The Norwegian University of Science and Technology.
- Rezvani, M., Lashgari, M., & Farsi, J. Y. (2018). Organizational entrepreneurial alertness framework in opportunity discovery. *Academy of Entrepreneurship Journal, 24*(2).
- Ribeiro, H. C. M., & Cirani, C. B. . (2013). Análise da produção científica da revista de administração e inovação. *RAI Revista de Administração e Inovação, 10*(4), 208–228.
- Roundy, P. T., Harrison, D. A., Khavul, S., Pérez-Nordtvedt, L., & McGee, J. E. (2018). Entrepreneurial alertness as a pathway to strategic decisions and organizational performance. *Strategic Organization, 16*(2), 192–226.
<https://doi.org/10.1177/1476127017693970>
- Ruven, H., & Leonie, B. (2018). Opportunity recognition in sustainable entrepreneurship: an

- exploratory study. *International Journal of Entrepreneurial Behaviour and Research*, 24(2), 333–358. <https://doi.org/10.1108/IJEER-12-2015-0275>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Ryu, P., & Kim, D. (2020). Moderating effect of gender on the opportunity recognition and entrepreneurial intention. *Entrepreneurship and Sustainability Issues*, 8(1), 725–740. [https://doi.org/10.9770/jesi.2020.8.1\(49\)](https://doi.org/10.9770/jesi.2020.8.1(49))
- Sambamurthy, Bharadwaj, & Grover. (2003). Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms. *MIS Quarterly*, 27(2), 237. <https://doi.org/10.2307/30036530>
- Santos, V., & García, T. (2011). Business motivation and informational needs in internationalization. *Journal of International Entrepreneurship*, 9(3), 195–212. <https://doi.org/10.1007/s10843-011-0077-y>
- Sarason, Y., Dean, T., & Dillard, J. F. (2006). Entrepreneurship as the nexus of individual and opportunity: A structuration view. *Journal of Business Venturing*, 21(3), 286–305. <https://doi.org/10.1016/j.jbusvent.2005.02.007>
- Sarasvathy, S. D., & Venkataraman, S. (2011). Entrepreneurship as method: open questions for an entrepreneurial future. *Entrepreneurship Theory and Practice*, 35(1), 113–135.
- Saunders, M. N., Lewis, P., & Thornhill, A. (2008). *Research Methods for Business Students*. Pearson Education, New York. <https://doi.org/10.1108/qmr.2000.3.4.215.2>
- Savalei, V., & Kolenikov, S. (2008). Constrained Versus Unconstrained Estimation in Structural Equation Modeling. *Psychological Methods*, 13(2), 150–170. <https://doi.org/10.1037/1082-989X.13.2.150>
- Schumpeter, J. (1934). *Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*. Harvard University Press, Cambridge, MA.
- Schwab, D. P. (2005). Research methods for organizational studies: Second edition. In *New jersey, USA: Lawrence Earlbaum Associate, Inc.* <https://doi.org/10.4324/9781410611284>
- Shane, S. (2000). Prior Knowledge and the Discovery of Entrepreneurial Opportunities. *Organization Science*, 11(4), 448–469. <https://doi.org/10.1287/orsc.11.4.448.14602>
- Shane, S. (2003). *A general theory of entrepreneurship: The individual-opportunity nexus*.

Edwards Elgar Publishing, Cheltenham.

- Shane, S., Locke, E. A., & Collins, C. J. (2003). Entrepreneurial motivation. *Human Resource Management Review*, 13(2), 257–279. [https://doi.org/10.1016/S1053-4822\(03\)00017-2](https://doi.org/10.1016/S1053-4822(03)00017-2)
- Shane, S., & Venkataraman, S. (2000a). The Promise of Entrepreneurship as a Field of Research. *The Academy of Management Review*, 25(1), 217. <https://doi.org/10.2307/259271>
- Shane, S., & Venkataraman, S. (2000b). the Promise of Entrepreneurship As a Field of Research. *The Academy of Management Review*, 25(1), 217–226. <https://doi.org/10.2307/259271>
- Shapiro, A., & Sokol's, L. (1982). Social dimensions of entrepreneurship. In C. Kent, D. Sexton and K. Vesper, eds., *The Encyclopedia of Entrepreneurship* *The Encyclopedia of Entrepreneurship* (pp. 72–90). Englewood Cliffs, NJ: Prentice- Hall.
- Sharma, L. (2019). A systematic review of the concept of entrepreneurial alertness. *Journal of Entrepreneurship in Emerging Economies*, 11(2), 217–233. <https://doi.org/10.1108/JEEE-05-2018-0049>
- Sheeran, P. (2002). Intentions-behavior relations: a conceptual and emperical review. In W. Strobe, & M. Hewstone (Eds.), *European Review of Social Psychology*, 12, 1–36.
- Shepherd, D. A., & DeTienne, D. R. (2005a). Prior knowledge, potential financial reward, and opportunity identification. *Entrepreneurship: Theory and Practice*, 29(1), 91–112. <https://doi.org/10.1111/j.1540-6520.2005.00071.x>
- Shepherd, D. A., & DeTienne, D. R. (2005b). The impact of prior knowledge and financial reward on the identification of opportunities. *Entrepreneurship Theory and Practice*, 29(1), 91–112.
- Shepherd, D. A., McMullen, J. S., & Ocasio, W. (2017). Is that an opportunity? An attention model of top managers' opportunity beliefs for strategic action. *Strategic Management Journal*, 38(3), 626–644. <https://doi.org/10.1002/smj.2499>
- Shepherd, D. A., & Patzelt, H. (2018a). Emotion and Entrepreneurial Cognition. In *Entrepreneurial Cognition: Exploring the Mindset of Entrepreneurs* (pp. 201–258). https://doi.org/10.1007/978-3-319-71782-1_6
- Shepherd, D. A., & Patzelt, H. (2018b). Motivation and Entrepreneurial Cognition. In *Entrepreneurial Cognition: Exploring the Mindset of Entrepreneurs* (pp. 51–103). https://doi.org/10.1007/978-3-319-71782-1_3

- Shinnar, R. S., Powell, B. C., & Zhou, H. (2018). Entrepreneurial intentions and start-ups: Are women or men more likely to enact their intentions? *International Small Business Journal*, 36(1), 60–80.
- Shirokova, G., Osiyevskyy, O., & Bogatyreva, K. (2016). Exploring the intention-behavior link in student entrepreneurship. *European Management Journal*, 34, 386–399.
- Shook, C. L., Ketchen, D. J., Hult, G. T. M., & Kacmar, K. M. (2004). An assessment of the use of structural equation modeling in strategic management research. *Strategic Management Journal*, 25(4), 397–404. <https://doi.org/10.1002/smj.385>
- Short, J. C., Ketchen, D. J., Shook, C. L., & Ireland, R. D. (2010). The concept of “Opportunity” in entrepreneurship research: Past accomplishments and future challenges. *Journal of Management*, 36(1), 40–65. <https://doi.org/10.1177/0149206309342746>
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7(4), 422–445. <https://doi.org/10.1037/1082-989X.7.4.422>
- Siegel, D. S., & Renko, M. (2012). The role of market and technological knowledge in recognizing entrepreneurial opportunities. *Management Decision*, 50(5), 797–816. <https://doi.org/10.1108/00251741211227500>
- Sigrist. (1999). *Entrepreneurial Opportunity Recognition. A presentation at Annual UIC/AMA Symposium at Marketing/Entrepreneurship Interface, Sofia-antipolis.*
- Simsek, Z., Lubatkin, M. H., Veiga, J. F., & Dino, R. N. (2009). The role of an entrepreneurially alert information system in promoting corporate entrepreneurship. *Journal of Business Research*, 62(8). <https://doi.org/10.1016/j.jbusres.2008.03.002>
- Singh, R. P. (2000). *Entrepreneurial opportunity recognition through social networks.* Psychology Press,.
- Smith, A. W., Moghaddam, K., & Lanivich, S. E. (2019). A set-theoretic investigation into the origins of creation and discovery opportunities. *Strategic Entrepreneurship Journal*, 13(1), 75–92. <https://doi.org/10.1002/sej.1299>
- Smith, K. G., & Di Gregorio, D. (2002). The role of entrepreneurial action in the market process. *Strategic Entrepreneurship: Creating a New Mindset*, 129–146.
- Solesvik, M. (2013). Entrepreneurial motivations and intentions: Investigating the role of education major. *Education and Training*, 55(3), 253–271.

- <https://doi.org/10.1108/00400911311309314>
- Spector, P. E. (2006). Method variance in organizational research: Truth or urban legend? *Organizational Research Methods*, 9(2), 221–232.
<https://doi.org/10.1177/1094428105284955>
- Stephen, K., & John E, B. (2007). Creativity: A key link to entrepreneurial behavior. *Business Horizons*, 50(5), 365–372. <https://doi.org/10.1016/j.bushor.2007.03.002>
- Stone-Romero, E. F. (2004). Review of experimental and quasi experimental designs for generalized causal inference. In *Organizational research methods* (Vol. 7, pp. 224–227).
- Straub, D., & Gefen, D. (2004). Validation Guidelines for IS Positivist Research. *Communications of the Association for Information Systems*, 13(24), 380–427.
<https://doi.org/10.17705/1cais.01324>
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics*. Harper Collins.
- Tang, J. (2008). Environmental munificence for entrepreneurs: Entrepreneurial alertness and commitment. *International Journal of Entrepreneurial Behaviour & Research*, 14(3), 128–151. <https://doi.org/10.1108/13552550810874664>
- Tang, J. (2009). Exploring the Constitution of Entrepreneurial Alertness: The Regulatory Focus View. *Journal of Small Business and Entrepreneurship*, 22(3), 221–238.
<https://doi.org/10.1080/08276331.2009.10593452>
- Tang, J. (2010). How entrepreneurs discover opportunities in China: An institutional view. *Asia Pacific Journal of Management*, 27(3), 461–479. <https://doi.org/10.1007/s10490-009-9151-6>
- Tang, J., Kacmar, K. M. M., & Busenitz, L. (2012). Entrepreneurial alertness in the pursuit of new opportunities. *Journal of Business Venturing*, 27(1), 77–94.
<https://doi.org/10.1016/j.jbusvent.2010.07.001>
- Tharenou, P., Donohue, R., & Cooper, B. (2007). *Management research methods*.
<https://doi.org/10.1017/CBO9780511810527>
- Timmons, J. (1994). *The Entrepreneurial Process*. In *New Venture Creation: Entrepreneurship for the 21st Century* (4th ed.). Irwin: Burr Ridge, IL, USA.
- Troise, C., & Tani, M. (2020). Exploring entrepreneurial characteristics, motivations and behaviours in equity crowdfunding: some evidence from Italy. *Management Decision*, 59(5), 995–1024. <https://doi.org/10.1108/MD-10-2019-1431>

- Tseng, H. C., & Kang, L. M. (2008). How does regulatory focus affect uncertainty towards organizational change? *Leadership and Organization Development Journal*, 29(8), 713–731. <https://doi.org/10.1108/01437730810916659>
- Tsou, H. T., & Cheng, C. C. J. (2018). How to enhance IT B2B service innovation? An integrated view of organizational mechanisms. *Journal of Business and Industrial Marketing*, 33(7), 984–1000. <https://doi.org/10.1108/JBIM-07-2017-0175>
- Tung, D. T., Hung, N. T., Phuong, N. T. C., Loan, N. T. T., & Chong, S. C. (2020). Enterprise development from students: The case of universities in Vietnam and the Philippines. *International Journal of Management Education*, 18(1). <https://doi.org/10.1016/j.ijme.2019.100333>
- Ucbasaran, D., Westhead, P., & Wright, M. (2008). Opportunity identification and pursuit: Does an entrepreneur's human capital matter? *Small Business Economics*, 30(2), 153–173. <https://doi.org/10.1007/s11187-006-9020-3>
- Urban, B. (2017). Corporate entrepreneurship in South Africa: The role of organizational factors and entrepreneurial alertness in advancing innovativeness. *Journal of Developmental Entrepreneurship*, 22(3), 1750015. <https://doi.org/10.1142/S1084946717500157>
- Urban, B. (2019). Institutional influence on entrepreneurial alertness and business growth in an emerging market context. *Institutions and Economies*, 11(3), 93–117.
- Valliere, D. (2013). Towards a schematic theory of entrepreneurial alertness. *Journal of Business Venturing*, 28(3), 430–442. <https://doi.org/10.1016/j.jbusvent.2011.08.004>
- Van, E., Nees, J., & Waltman, L. (2009). How to normalize cooccurrence data? An analysis of some well-known similarity measures. *Journal of the American Society for Information Science and Technology*, 60(8), 1635–1651. <http://dx.doi.org/10.1002/asi.21075>
- Van, E., Nees, J., & Waltman, L. (2011). Text mining and visualization using VOSviewer. *ISSI Newsletter*, 7(3), 1–5. <https://doi.org/10.1371/journal.pone.0054847>
- Van, E., Nees, J., & Waltman, L. (2018). *VOSviewer Manual*. <https://doi.org/10.3402/jac.v8.30072>
- Van Gelderen, M., Brand, M., Van Praag, M., Bodewes, W., Poutsma, E., & Van Gils, A. (2008). Explaining entrepreneurial intentions by means of the theory of planned behaviour. *Career Development International*, 13(6), 538–559. <https://doi.org/10.1108/13620430810901688>

- Van Gelderen, M., Kautonen, T., & Fink, M. (2015). From entrepreneurial intentions to actions: Self-control and action-related doubt, fear, and aversion. *Journal of Business Venturing*, 30(5), 655–673. <https://doi.org/10.1016/j.jbusvent.2015.01.003>
- Veilleux, S., Béliveau, D., & Haskell, N. (2018). Opportunity recognition by international high-technology start-up and growth photonics firms. *International Journal of Entrepreneurship and Innovation Management*, 22(1/2), 126. <https://doi.org/10.1504/ijeim.2018.10010671>
- Venkataraman, S. (1997). The Distinctive Domain of Entrepreneurship Research. *Advances in Entrepreneurship, Firm Emergence and Growth*, 3(October), 119–138. <https://doi.org/10.2139/ssrn.1444184>
- Volery, T., Müller, S., Oser, F., Naepflin, C., & del Rey, N. (2013). The impact of entrepreneurship education on human capital at upper-secondary level. *Journal of Small Business Management*, 51(3), 429–446. <https://doi.org/10.1111/jsbm.12020>
- Waltman, L., van Eck, N. J., & Noyons, E. C. M. (2010). A unified approach to mapping and clustering of bibliometric networks. *Journal of Informetrics*, 4(4), 629–635. <https://doi.org/10.1016/j.joi.2010.07.002>
- Wannamakok, W., & Chang, Y. Y. (2020). Understanding nascent women entrepreneurs: an exploratory investigation into their entrepreneurial intentions. *Gender in Management*, 35(6), 553–566. <https://doi.org/10.1108/GM-12-2019-0250>
- Ward, T. (2004). Cognition, creativity, and entrepreneurship. *Journal of Business Venturing*, 19(2), 173–180.
- Wegner, T. (2012). *Applied business statistics : methods and Excel-based applications* (Third Edit). Juta Academic. South Africa.
- Welsh, D. H. B., Memili, E., & Kaciak, E. (2016). An empirical analysis of the impact of family moral support on Turkish women entrepreneurs. *Journal of Innovation & Knowledge*, 1(1), 3–12. <https://doi.org/10.1016/j.jik.2016.01.012>
- Westhead, P., & Solesvik, M. (2016). Entrepreneurship education and entrepreneurial intention: Do female students benefit? *International Small Business Journal: Researching Entrepreneurship*, 34(8), 979–1003. <https://doi.org/10.1177/0266242615612534>
- Wiklund, J., & Shepherd, D. A. (2013). Aspiring for, and achieving growth: The moderating role of resources and opportunities. In *New Perspectives on Firm Growth* (Vol. 40, Issue 8, pp. 56–81). <https://doi.org/10.4337/9780857933614.00010>

- Williams, C. C., & Round, J. (2009). Evaluating informal entrepreneurs' motives: Evidence from Moscow. *International Journal of Entrepreneurial Behaviour and Research*, *15*(1), 94–107. <https://doi.org/10.1108/13552550910934477>
- Wilson, F., Kickul, J., & Marlino, D. (2007). Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: Implications for entrepreneurship education. *Entrepreneurship: Theory and Practice*, *31*(3), 387–406. <https://doi.org/10.1111/j.1540-6520.2007.00179.x>
- Yasir, M., Majid, A., & Yasir, M. (2017). Entrepreneurial knowledge and start-up behavior in a turbulent environment. *Journal of Management Development*, *36*(9), 1149–1159. <https://doi.org/10.1108/jmd-10-2016-0193>
- Yates, A. J. (2000). The Knowledge Problem, Entrepreneurial Discovery, and Austrian Market Process Theory. *Journal of Economic Theory*, *91*(1), 59–85. <https://doi.org/10.1006/jeth.1999.2598>
- Yordanova, D. I., & Tarrazon, M. A. (2010). Gender differences in entrepreneurial intentions: Evidence from Bulgaria. *Journal of Developmental Entrepreneurship*, *15*(3), 245–261. <https://doi.org/10.1142/S1084946710001543>
- Yu, T. F. U. L. (2001). Entrepreneurial alertness and discovery. *Review of Austrian Economics*, *14*(1), 47–63. <https://doi.org/10.1023/A:1007855505727>
- Zaheer, A., & Zaheer, S. (1997). Catching the Wave: Alertness, Responsiveness, and Market Influence in Global Electronic Networks. *Management Science*, *43*(11), 1493–1509. <https://doi.org/10.1287/mnsc.43.11.1493>
- Zanella, G., Castro Solano, D. B., Hallam, C. R. A., & Guda, T. (2019). The role of the organization in the entrepreneur–opportunity nexus. *International Journal of Entrepreneurial Behaviour and Research*, *25*(7), 1537–1562. <https://doi.org/10.1108/IJEER-03-2018-0169>

Appendix A- Questionnaire (English Version)

I am Shahzada Adeel, Ph.D. student in Management under the supervision of Prof. Ana Daniel at university of Aveiro. I am conducting a research as a partial fulfilment of my doctorate degree requirement. This questionnaire seeks to analyze the impact of entrepreneurial alertness in opportunity recognition among the university students. The students would be analyzed on both scenarios, either having entrepreneurial education or not. The information obtained through this questionnaire will be confidential and only be used for research purpose. It will take approximately 8 minutes. Thank you.

1. **University:** _____

2. **Nationality:**

Portuguese

Other(s)

3. **Age:**

Less than 20 years

Between 26 to 30 years

Between 20 to 25 years

More than 30 years

4. **Gender:** Male Female

5. **What degree of studies are you attending?**

Bachelor's/ Graduation

Master

Postgraduate

Ph.D.

6. **What year you are attending?** _____

7. **What is the scientific area of the course you are attending?**

Life Sciences and health

Natural and environment science

Exact Sciences and Engineering

Social sciences and humanities

8. **What is the course?** _____

9. **Have you ever attended any training in entrepreneurship?**

Yes

No

10. **If yes, what type of programe?**

Extra-curricular training activity

Subject within a course curriculum

11. If yes, what was the duration (hours)?

- | | |
|---|--|
| <input type="checkbox"/> Less than 8 hours | <input type="checkbox"/> Between 31 to 60 hours |
| <input type="checkbox"/> Between 9 to 16 hours | <input type="checkbox"/> Between 61 to 90 hours |
| <input type="checkbox"/> Between 17 to 24 hours | <input type="checkbox"/> Between 91 to 120 hours |
| <input type="checkbox"/> Between 25 to 30 hours | <input type="checkbox"/> More than 120 hours |

12. Do you have any professional experience of any kind?

- | | |
|---|--|
| <input type="checkbox"/> No professional experience | <input type="checkbox"/> 1 – 3 year |
| <input type="checkbox"/> Less than 1 year | <input type="checkbox"/> More than 3 years |

13. Please indicate to what extent you agree or disagree with the following statements:

	1	2	3	4	5	6	7
	(strongly disagree)			(strongly agree)			
I have frequent interactions with others to acquire new information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I always keep an eye out for new business ideas when looking for information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I read news, magazines, or trade publications regularly to acquire new information's.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I browse the internet every day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am an avid information seeker.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am always actively looking for new information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I see links between seeming unrelated piece of information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am good at connecting dots.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I often see connections between previously unconnected domains of information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a gut feeling for potential information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can distinguish between profitable opportunities and not-so-profitable opportunities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a knack for telling high-values opportunities apart from the low-value opportunities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When facing multiple opportunities, I am able to select the good ones.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Please indicate to what extent you agree or disagree with the following statements:

	1	2	3	4	5	6	7
	(strongly disagree)			(strongly agree)			
I am ready to do anything to be an entrepreneur.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My professional goal is to become an entrepreneur.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am determined to create a business venture in the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have thought very seriously about starting a firm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I have got the intention to start a firm one day.

I intend to start a firm within 5 years of graduation.

15. Please indicate to what extent you agree or disagree with the following statements:

	1	2	3	4	5
	(strongly disagree)			(strongly agree)	
I acquire information from mistakes that happen during work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can bring information relating to my field to mind very quickly and easily.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My knowledge of my field is broad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My present venture is highly based on my previous work experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My education plays a significant role in recognizing opportunities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My understanding of the local community and their needs plays a significant role in recognizing opportunities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Please indicate to what extent you agree or disagree with the following statements:

	1	2	3	4	5
	(strongly disagree)			(strongly agree)	
While going about routine day to day activities, I see potential new venture ideas all around me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have special “alertness” or sensitivity toward new venture opportunities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
“Seeing” potential new venture opportunities do not come very naturally to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I frequently identify the ideas that can be converted into new products and services.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I generally lack ideas that may materialize into profitable enterprise.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I frequently identify the opportunities to start up new business.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. Please indicate to what extent you agree or disagree with the following statements which apply to any of your current or previous activities:

	1	2	3	4	5	6	7
	(strongly disagree)				(strongly agree)		
Discussed product or business idea with potential customers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collected information about markets or competitors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written a business plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Started product/service development.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Started marketing or promotion efforts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Purchased material, equipment or machinery for the	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

business.

Attempted to obtain external funding.

Applied for a patent, copyright or trademark.

Registered the company.

Sold product or service.

18. Please indicate to what extent you agree or disagree with the following statements regarding the motivations you seek when starting a new business:

	1	2	3	4	5	6	7
	(strongly disagree)			(strongly agree)			
Financial gain.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is no job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To be independent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To provide job opportunities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have a higher social position.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To be more flexible in the work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To use my creativity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To develop more experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Self-achievement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have control.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To achieve my vision.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Please indicate to what extent you agree or disagree with the following statements:

	1	2	3	4	5	6	7
	(strongly disagree)			(strongly agree)			
I try to understand the deeper needs of potential customers or users.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can understand other person's needs even when they say nothing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not really care about how other people feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can be "attuned" to someone else's mood.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When a person starts talking about their problems, I find it difficult to change the subject of the conversation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I take pleasure in making other people happy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel a strong impulse to solve problems that have an impact on other people's lives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can propose solutions to solve the perceived need identified by interacting with other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thanks for your cooperation

Appendix B- Questionnaire (Portuguese Version)

Eu sou o Shahzada Adeel, um estudante de doutoramento em Gestão, sob a orientação da Prof^a. Ana Daniel na Universidade de Aveiro. Estou a conduzir uma pesquisa como cumprimento parcial do meu requisito de doutorado. Este questionário procura analisar o impacto do alerta empreendedor no reconhecimento de oportunidades entre os universitários. Os alunos serão analisados em ambos os cenários, seja com formação empreendedora ou não. As informações obtidas através deste questionário serão confidenciais e serão usadas somente para fins de pesquisa. Este questionário irá demorar aproximadamente 8 minutos. Obrigado.

1- **Universidade:** _____

2- **Nacionalidade:**

Portuguesa

Outras

3- **Idade:**

Menos de 20 anos

Entre 26 e 30 anos

Entre 20 e 25 anos

Mais de 30 anos

4- **Género:** Masculino Feminino

5- **Qual o grau de estudos que está a frequentar?**

Licenciatura/ Graduação

Mestrado

Pós-graduação

Doutoramento

6- **Qual o ano que está a frequentar?** _____

7- **Qual é a área de estudos que se encontra a frequentar?**

Ciências da vida e da saúde

Ciências naturais do ambiente

Ciências exatas e engenharia

Ciências sociais e humanidades

8- **Já frequentou/frequenta alguma formação na área do empreendedorismo?**

Sim

Não

9- **Se sim, que tipo de formação?**

Atividade de formação extra-curricular

Disciplina dentro do currículo do curso

10- **Se sim, qual a duração (horas)?**

- | | |
|--|---|
| <input type="checkbox"/> Menos de 8 horas | <input type="checkbox"/> Entre 31 e 60 horas |
| <input type="checkbox"/> Entre 9 e 16 horas | <input type="checkbox"/> Entre 61 e 90 horas |
| <input type="checkbox"/> Entre 17 e 24 horas | <input type="checkbox"/> Entre 91 e 120 horas |
| <input type="checkbox"/> Entre 25 e 30 horas | <input type="checkbox"/> Mais de 120 horas |

11- Tem qualquer tipo de experiência profissional?

- | | |
|---|---|
| <input type="checkbox"/> Sem experiência profissional | <input type="checkbox"/> 1 – 3 anos |
| <input type="checkbox"/> Menos de 1 ano | <input type="checkbox"/> Mais de 3 anos |

12- Indique em que medida concorda ou discorda das seguintes afirmações:

	1	2	3	4	5	6	7
	(discordo totalmente)			(concordo totalmente)			
Interajo frequentemente com outros para obter novas informações.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Estou sempre atento a novas ideias de empreendedorismo ao procurar por informação.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leio as notícias, revistas, publicações comerciais regularmente para obter novas informações.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utilizo a internet diariamente.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procuro a informação avidamente.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Estou sempre à procura de novas informações.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sou capaz de ver ligações entre informações aparentemente não relacionadas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sou bom a “ligar os pontos”.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Muitas vezes vejo conexões entre domínios de informação anteriormente desconectados	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eu tenho um pressentimento para informações com potencial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sou capaz de distinguir oportunidades rentáveis de oportunidades não tão rentáveis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tenho o dom de diferenciar oportunidades de altos valores das oportunidades de baixo valor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quando estou perante várias oportunidades, sou capaz de escolher as melhores.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13- Indique em que medida concorda ou discorda das seguintes afirmações:

	1	2	3	4	5	6	7
	(discordo totalmente)			(concordo totalmente)			
Estou pronto para fazer qualquer coisa para ser um empreendedor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
O meu objetivo profissional é ser um empreendedor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Estou determinado em criar uma empresa no futuro	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Penso seriamente em começar uma empresa.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tenho a intenção de começar uma empresa um dia.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Tenho a intenção de começar uma empresa após 5 anos da graduação.

14- Indique em que medida concorda ou discorda das seguintes afirmações:

	1	2	3	4	5
	(discordo totalmente)				(concordo totalmente)
Eu adquiro informação dos erros que ocorrem durante o trabalho.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eu consigo trazer informação relativas à minha área para a minha mente de forma rápida e fácil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tenho um conhecimento amplo da minha área.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
O meu negócio atual é altamente baseado na minha experiência de trabalho anterior.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A minha educação desempenha um papel significativo no reconhecimento de oportunidades.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A minha compreensão da comunidade local e das suas necessidades desempenha um papel significativo no reconhecimento de oportunidades.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15- Indique em que medida concorda ou discorda das seguintes afirmações:

	1	2	3	4	5
	(discordo totalmente)				(concordo totalmente)
Durante as atividades do quotidiano, vejo novas ideias com potencial de negócio, em meu redor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tenho especial “alerta” ou sensibilidade em relação às novas oportunidades de negócio.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
“Ver” potenciais oportunidades de novos negócios não é muito fácil para mim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequentemente, identifico as ideias que podem ser convertidas em novos produtos e/ou serviços.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geralmente não tenho ideias que se possam materializar numa empresa lucrativa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequentemente, identifico as oportunidades para iniciar novos negócios	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16- Indique em que medida concorda ou discorda das seguintes afirmações que se aplicam a qualquer uma das suas atividades atuais ou anteriores:

	1	2	3	4	5	6	7
	(discordo totalmente)					(concordo totalmente)	
Discuti um produto ou uma ideia de negócio com potenciais clientes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obtive informações sobre os mercados ou concorrentes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Escreveu um plano de negócios.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Começou o desenvolvimento de um produto/serviço.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Começou com esforços de marketing ou promoção	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comprou material, equipamento ou maquinaria para o negócio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	1	2	3	4	5	6	7
	(discordo totalmente)						(concordo totalmente)
Tentou obter financiamentos externos.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procurou obter uma patente, direitos autorais ou uma marca registrada.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Registrou a empresa.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vendeu um produto ou serviço.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17- Indique em que medida concorda ou discorda com as seguintes afirmações acerca das suas motivações em começar um novo negócio:

	1	2	3	4	5	6	7
	(discordo totalmente)						(concordo totalmente)
Ganhos financeiros.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Não há emprego.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para ser independente.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para fornecer oportunidades de emprego	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para ter uma posição social superior.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para ser mais flexível no meu trabalho.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para usar a minha criatividade.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para ganhar mais experiência.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Auto-realização.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para ter controlo.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para alcançar o meu sonho	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18- Indique em que medida concorda ou discorda das seguintes afirmações:

	1	2	3	4	5	6	7
	(discordo totalmente)						(concordo totalmente)
Procuro perceber quais as necessidades mais profundas dos potenciais clientes ou utilizadores.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consigo perceber quais as necessidades da outra pessoa mesmo quando não dizem nada.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Não me interessa realmente pela forma como as outras pessoas sentem.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consigo ficar “sintonizado” com o estado de ânimo de outra pessoa.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quando uma pessoa começa a falar dos seus problemas, tenho dificuldade em mudar o tema da conversa.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tenho prazer em fazer as outras pessoas felizes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sinto um forte impulso por resolver problemas que têm impacto na vida das outras pessoas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consigo propor soluções para resolver a necessidade percebida identificada através da interação com outras pessoas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Obrigado pela sua colaboração