

Pedro Afonso Cortez



**PSYCHOMETRICS STUDIES AND RESPONSE BIAS
CONTROL: CONTRIBUTIONS TO
PSYCHOLOGICAL ASSESSMENT AND MENTAL
HEALTH OF POTENTIAL ENTREPRENEURS**

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**PSYCHOMETRICS STUDIES AND RESPONSE
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Tese apresentada ao Programa de Pós-Graduação *Stricto Sensu* em Psicologia da Universidade São Francisco, Área de Concentração - Avaliação Psicológica, para obtenção do título de Doutor.

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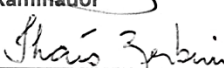
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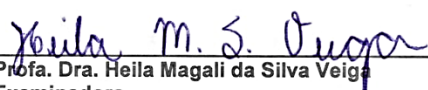
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Table of Contents

Abstract.....	9
Resumo	10
Resumen.....	11
List of Figures	12
List of Tables	13
Introduction.....	14
Entrepreneurship as Psychological Process and Entrepreneur as Personal Characteristics.....	16
Entrepreneurial Potential in a Bibliometric Review: Undergraduate Students as Future Entrepreneurs	18
Core Definitions: What are Entrepreneurial Motives?.....	29
Core Definitions: What is Entrepreneurial Intention?	32
Why Entrepreneurial Motives and Entrepreneurial Intention are Important in Entrepreneurial Potential Research?	35
The Triad Basis to the Entrepreneurial Potential Approach: Entrepreneurship as Policy Making and Future Agenda for Personal and Social Development.....	40
Studies Overview	43
General Objectives	43
Specifics Objectives	43
Study A – Paper 1: Cultural adaptation and internal structure for entrepreneurial motives and its relation with Big Five..	44
Overview.....	45
Method.....	47
Results.....	49
Discussion	52
References.....	54
Study B – Paper 2: Cultural adaptation and internal structure for entrepreneurial intention and its relation with Big Five..	62
Overview.....	63
Method.....	64
Results.....	66
Discussion	69
References.....	71
Study C – Paper 3: Prediction of entrepreneurial motives and entrepreneurial intention and its relation with psychopathy..	78
Overview.....	79
Method	82
Results.....	84
Discussion	87
References.....	91
General Discussion.....	102
References.....	111
Appendix.....	138

Cortez, P. A. (2019). *Psychometrics studies and response bias control: contributions to psychological assessment and mental health of potential entrepreneurs*. Doctoral Thesis, Programa de Pós-graduação Stricto Sensu em Psicologia. Campinas: Universidade São Francisco.

Abstract

The present thesis aimed to propose evidence to the measurement of potential entrepreneurs' characteristics with Brazilian undergraduate students and test an evidence-based model to guide the development of entrepreneurial potential investigations and practices among that public. To achieve that, it examined the entrepreneurial potential literature to comprehend its limitations, specified an empirical model to test its gaps, and derivate a theoretical and empirical agenda to that field focused on a triad basis (humanized ethics, mental health, and well-being) for personal and social development among undergraduate students. Initially, the first and second studies showed, respectively, cultural adaptation and psychometric analysis of entrepreneurial motives and entrepreneurial intention scales. The results showed adequate psychometric properties for both instruments that were optimized to the assessment of those attributes among Brazilian undergraduate students with the use of modern methods and algorithms to control method and response bias. Relying on the positive evidence obtained to those instruments, the third studied tested an empirical model that considered the relations between entrepreneurial motives, entrepreneurial intention, and psychopathy among Brazilian undergraduate students. The core results from the third study demonstrated that entrepreneurial intention and unproductive entrepreneurial motives are explained by primary and secondary psychopathy. It also highlighted that unproductive entrepreneurial motives have a higher effect on entrepreneurial intention when compared to productive entrepreneurial motives. That evidence indicated the current neutral entrepreneurial potential, that does not include a humane conception of entrepreneurship as offered by triad basis (humanized ethics, mental health, and well-being), may lack on its ontology and implications. The current entrepreneurial potential approach only focuses on boosting entrepreneurial activity among potential entrepreneurs, but do not consider entrepreneurship qualities, which requires the analysis of purposes and externalities during the entrepreneurial process. Finally, a model to integrate the triad basis (humanized ethics, mental health and well-being) on the action characteristics model of entrepreneurship is proposed in order to guide the development of entrepreneurial potential investigations and practices among that public focusing on personal and social development as a policy-making to the entrepreneurship field when considering theoretical influence from psychology and modern applications from psychometrics.

Keywords: personnel evaluation, social policy, occupational health, occupations, test bias, student characteristics

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Resumo

A presente tese teve como objetivo propor evidências para a mensuração das características de potenciais empreendedores com estudantes brasileiros de graduação e testar um modelo baseado em evidências para orientar o desenvolvimento de investigações e práticas entre esse público. Para isso, revisou-se a literatura sobre potencial empreendedor para entender suas limitações, especificou-se um modelo empírico para testar as lacunas identificadas e derivou-se uma agenda teórica e empírica para esse campo focado em uma tríade conceitual (ética humanizada, saúde mental e bem-estar) focada no desenvolvimento pessoal e social de estudantes de graduação. Inicialmente, o primeiro e o segundo estudos mostraram, respectivamente, a adaptação cultural e análise psicométrica das escalas de motivos para empreender e de intenção empreendedora. Os resultados indicaram propriedades psicométricas adequadas para ambos os instrumentos, os quais foram otimizados para a avaliação desses atributos entre estudantes brasileiros de graduação com o uso de métodos e algoritmos modernos para o controle de vieses de método e estilos de resposta. Baseando-se nas evidências positivas obtidas para esses instrumentos, testou-se, no terceiro estudo, um modelo empírico que considerava as relações entre motivos para empreender, intenção empreendedora e psicopatologia entre os universitários brasileiros. Os principais resultados do terceiro estudo demonstraram que a intenção empreendedora e os motivos improdutivos para empreender são explicados pela psicopatologia primária e secundária. O estudo também destacou que motivos improdutivos para empreender têm um efeito maior sobre a intenção empreendedora, quando comparados aos motivos produtivos para empreender. Essas evidências indicaram que a atual proposta de potencial empreendedor neutra, que não inclui uma concepção humanizada de empreendedorismo oferecida pela tríade conceitual (ética humanizada, saúde mental e bem-estar), é lacunar quanto à ontologia e implicação empreendedora. A atual abordagem do potencial empreendedor concentra-se apenas em impulsionar a atividade empreendedora entre potenciais empreendedores, mas não qualifica o empreendedorismo, o que requer a análise de propósitos e externalidades durante o processo empreendedor. Por fim, é proposto um modelo para integrar a tríade conceitual (ética humanizada, saúde mental e bem-estar) no modelo de características para ação do empreendedorismo, a fim de orientar o desenvolvimento de investigações sobre o potencial empreendedor e práticas entre o público dessa área de estudo, enfatizando o desenvolvimento pessoal e social como guia para a formulação de políticas para o campo do empreendedorismo, especialmente ao se considerar a influência teórica da psicologia e aplicações modernas da psicometria.

Palavras-chave: avaliação de recursos humanos, política social, saúde ocupacional, profissões, vieses do teste, características do estudante

Cortez, P. A. (2019). *Estudios de psicometría y control del sesgo de respuesta: contribuciones a la evaluación psicológica y salud mental de los posibles emprendedores*. Tesis de Doctorado, Programa de Pós-graduação Stricto Sensu em Psicologia. Campinas: Universidade São Francisco.

Resumen

La presente tesis tuvo como objetivo proponer evidencia para medir las características de los potenciales emprendedores con estudiantes universitarios brasileños y probar un modelo basado en evidencia para guiar el desarrollo de investigaciones y prácticas entre este público. Con este fin, se revisó la literatura sobre el potencial emprendedor para comprender sus limitaciones, se especificó un modelo empírico para probar las brechas identificadas y se derivó una agenda teórica y empírica para este campo centrada en una tríada conceptual (ética humanizada, salud mental y bienestar) enfocado en el desarrollo personal y social de estudiantes. Inicialmente, el primer y el segundo estudio mostraron, respectivamente, la adaptación cultural y el análisis psicométricas de las escalas motivos del emprendimiento y intención emprendedora. Los resultados indicaron propiedades psicométricas adecuadas para ambos instrumentos, que fueron optimizados para la evaluación de estos atributos entre estudiantes brasileños lo que ha sido mejorado con uso del métodos y algoritmos modernos para controlar los sesgos de método y estilos de respuesta. Con base en la evidencia positiva obtenida para estos instrumentos, el tercer estudio probó un modelo empírico que consideró las relaciones entre los motivos del emprendimiento, la intención emprendedora y la psicopatía entre los estudiantes universitarios brasileños. Los principales resultados del tercer estudio mostraron que la intención emprendedora y los motivos improductivos para el emprendimiento se explican por la psicopatía primaria y secundaria. El estudio también destacó que los motivos improductivos para el emprendimiento tienen un mayor efecto en la intención emprendedora en comparación con los motivos productivos para el emprendimiento. Esta evidencia ha indicado que la propuesta actual para un potencial emprendedurismo neutral, que no incluye una concepción humana del emprendimiento que ofrece la tríada conceptual (ética humanizada, salud mental y bienestar), es lacunar sobre la ontología y la implicación emprendeduría. El enfoque actual del potencial emprendedor preocuparse solo en impulsar la actividad emprendedora entre los emprendedores potenciales, pero no califica el emprendedurismo, lo que requiere un análisis de los propósitos e externalidad durante el proceso emprendedor. Finalmente, se propone un piloto para integrar la tríada conceptual (ética humanizada, salud mental y bienestar) en el modelo de acción empresarial, con el fin de guiar el desarrollo de la investigación sobre el potencial emprendedor y las prácticas entre el público en esta área, enfatizando el desarrollo personal y social como una guía para la formulación de políticas en el campo del emprendedurismo, especialmente cuando se considera la influencia teórica de la psicología y las aplicaciones modernas de la psicometría.

Palabras clave: evaluación de recursos humanos, política social, salud ocupacional, profesiones, sesgo del test, características del estudiante

List of Figures

<i>Figure 1.</i> Action-characteristic model of entrepreneurship and its level (Frese & Gielnik, 2014).....	18
<i>Figure 2.</i> Word growth by frequency in entrepreneurial potential literature worldwide.....	19
<i>Figure 3.</i> Lotka's distribution to entrepreneurial potential international literature.....	20
<i>Figure 4.</i> Conceptual structure map of entrepreneurial potential literature worldwide.....	21
<i>Figure 5.</i> Conceptual structure map of entrepreneurial potential literature in Brazil and Latin America.....	22
<i>Figure 6.</i> Lotka's distribution to entrepreneurial potential literature in Brazil and Latin America.....	23
<i>Figure 7.</i> Word growth by frequency in entrepreneurial potential literature in Brazil and Latin America.....	24
<i>Figure 8.</i> Countries' collaboration and connections between documents on entrepreneurial potential literature.....	25
<i>Figure 9.</i> Action-characteristic model of entrepreneurship (Frese & Gielnik, 2014)	40
<i>Figure 1C.</i> Action-characteristic model of entrepreneurship (Frese & Gielnik, 2014).....	81
<i>Figure 2C.</i> Representation of the first predictive model.....	86
<i>Figure 3C.</i> Representation of the second predictive model with two evaluative factors.....	87
<i>Figure 10.</i> Adapted action-characteristic model of entrepreneurship and its level including the Triad Basis (Frese & Gielnik, 2014).....	108

List of Tables

Table 1A. <i>Factor loading and internal consistency for entrepreneurial motives</i>	50
Table 2A. <i>Internal structure model indexes of entrepreneurial motives scale.....</i>	50
Table 3A. <i>Correlations between scores of productive and unproductive entrepreneurial motives scales formats.....</i>	51
Table 4A. <i>Correlations between personality, productive and unproductive entrepreneurial motives.....</i>	52
Table 1B. <i>Factor loading and internal consistency for the entrepreneurial intention.....</i>	67
Table 2B. <i>Internal structure model indexes of entrepreneurial intention.....</i>	68
Table 3B. <i>Correlations between scores of entrepreneurial intention scales formats.....</i>	68
Table 4B. <i>Correlations between personality and entrepreneurial intention.....</i>	69
Table 1C. <i>Measurement model adjustment for instruments.....</i>	85

Chapter 1

Introduction¹

Entrepreneurship is a complex and multidetermined phenomenon that has been studied by different approaches and knowledge fields. Those different areas had demonstrated economic, cultural, social, and psychological influence can boost or block the new business generation (Frese & Gielnik, 2014; Vale, 2014). In the current study, entrepreneurship is synonymous of looking for an opportunity to generate new business with an expectation of value creation. This conception has been proposed by Gartner (1990), in a critical approach to examine the definition of entrepreneurship among different subjects. Based on Gartner, we considered that innovative entrepreneurs seem rare, while the daily entrepreneur, who create a daily business is the one studies should focus on a planned improvement of our society and its economic practices.

Focused in that idea, the definition of an entrepreneur to the current thesis is derived as the agent who proposes own business and, along the entrepreneurship process, identify opportunities and manage own personal resources to generate new business (Carland, Hoy, & Carland, 1988). In the current study, it is vital to highlight one entrepreneurial agent, the potential entrepreneur. Potential in entrepreneurship literature has a polysemic conception. It may indicate conjunction of personal characteristics and competencies relevant to business generation. It also may refer to the potential entrepreneur as the individual who could create own business in the future if personal conditions and contextual stimulus turn that potential into a favorable behavioral expression (Krueger & Brazeal, 1994; Nielsen & Gartner, 2017).

¹ This doctoral thesis was written in the format of individual papers. Each individual paper includes abstract; introduction; method; results; and discussion. For this reason, the first introduction section briefly presents a panorama of the current research and its main concepts and problems to provide readers with some information about how the individual papers were elaborated and articulated in the last chapter under a general discussion.

Specifically, in this study, we focused on undergraduate students as potential entrepreneurs considering that, in Brazil, this public is involved in educational actions and public strategies to develop new business and integrate the entrepreneurial process. Brazilian National Strategy of Science and Technology provisioned to the period 2016-2022 is an example of those efforts (MCTI, 2016). This policy has different objectives, but it is important to highlight two strategic goals for this thesis: 1) identify entrepreneurial human capital among undergraduate students; 2) develop and support entrepreneurship to aggregate competitive advantage to Brazil in economic aspects.

In this thesis, the contribution to the first goal includes the psychological and psychometrical approach to comprehend individual characteristics that can be associated with future entrepreneurship among undergraduate students in Brazil (Eisenbarth, Lilienfeld, & Yarkoni, 2015; Podsakoff, MacKenzie, & Podsakoff, 2012). It also includes the proposition of psychometrical evidence to improve the instruments to the assessment of entrepreneurial motives and entrepreneurial intention with that public (Hmieleski & Lerner, 2016; Liñán & Chen, 2009). The second goal is covered with the test of a theoretical-empirical model to influence entrepreneurial potential approach development in a humanized ethical, health, and well-being perspective that privileges personal and social development as core values for entrepreneurship (Parente, ElTarabishy, Vesci, & Botti, 2018; Stephan, 2018).

For that purpose, the current thesis is sectioned in different chapters. The first chapter introduces the thesis with an overview of entrepreneurship as a research field, dynamic process, and individual attributes. It also focuses on core concepts of the thesis like entrepreneurial potential, entrepreneurial motives, entrepreneurial intention and the triad basis, this last one an innovative and integrated approach proposed in this thesis as new research and practical development for that area. Next, the second chapter presents thesis objectives and its three studies in with its specificities. The third and final chapter

summarises in a general discussion the theoretical presentation from chapter one and empirical evidence of the studies from chapter two to support the development of the triad basis as a new framework to entrepreneurial potential future developments. Altogether, those theoretical and empirical chapters aim to impact the measurement, theoretical and policymaking in the entrepreneurial potential approach with undergraduate students. Next, it is essential to concentrate on its foundation to start the thesis explanation.

Entrepreneurship as Psychological Process and Entrepreneur as Personal Characteristics

The entrepreneurship has a long story of the investigation, and there is no transparent approach to date its primary origin. A famous mark in the literature refers to entrepreneur citation by Adam Smith (1776) when referring to beer producers in the stables market. However, previous concepts, like Schumpeter (2006) idea of creative disruption to renew markets and Weber (2005) analysis of protestant spirit, had already considered the entrepreneurial process as necessary in our society during diverse economic and social periods.

In that conception, entrepreneurship has already been used as a synonym for different processes among market dynamics, innovation aspects, and sociocultural analysis (Murphy, Liao, & Welsch, 2006). The multidisciplinary historiography made by Hoselitz (1951) identify that entrepreneurship usually designates costumes of individuals and institutions, highlighting that the use of the term indicates a necessity to refers to a central process of our society (entrepreneurship) and its agent (entrepreneur). The process and its agent may change during different periods, but the core idea of entrepreneurial process among different definitions usually involves the creation of a new venture by an individual or social agent (Kuratko, 2016).

The study of entrepreneurship as a psychological theme was influenced by McClelland's (1961) ideas of need for achievement while the author analyzed the human's basic needs. McClelland (1987) found that need for affiliation and power were core concepts to understand human needs, but the need for achievement could be more explanatory when focusing on the entrepreneur agent. From his contributions to the current state of the art in entrepreneurship research had already passed more than 50th years, but the idea and the importance of an individual agent as a determinant to generate new business growth substantially and later on its systematical investigations that dates from 1980th to recent years (Carland et al., 1988; Ferreira, Fernandes, & Kraus, 2019; Gartner, 1989).

In that time lapse, different approaches developed comprehensions and competing models of entrepreneurship as expected in a multidisciplinary research field (Covin & Slevin, 1991; Krueger, Reilly, & Carsrud, 2000; Malecki, 2018). In the present study, we rely on the notion of entrepreneurship as a dynamic process, that retro feedback between different levels to predict as an outcome the new venture creation, due to its relevance and scientific supporting evidence in different studies (Frese, 2009; Shirokova, Osiyevskyy, & Bogatyreva, 2016; Wennekers, Van Stel, Carree, & Thurik, 2010). This model was integrated by Frese and Gielnik (2014) to comprehend entrepreneurship among different influence levels, considering from national to individual level.

Focusing on the individual level, there is a more depth lens to the psychology of entrepreneurship, once it emphasizes on personality, motivation, cognition, and behavior of the entrepreneur agent (Frese & Gielnik, 2014). That agent responsible for taking into action the new venture is the entrepreneur. Despite the multiple definitions of that term, we use the simple definition of an entrepreneur as the individual with personal resources that use owns efforts to propose a new venture focusing on different conceptions from literature (Gartner, 1989, 1990). That simple definition is necessary, once it fits with our

comprehension of entrepreneurship among undergraduate student and focus on individual level as show in Figure 1.

Influence Level	Variables	Outcome
National	Culture	New Venture Creation
	Effective Policy	
	Business Lifecycle	
Market	Industry Dynamics	
	Unpredictability	
Social Conditions	Education	
	Models in Family and Community	
	Personality	
Individual	Motivational Antecedents	
	Cognitions	
	Pre-action Characteristics	

Figure 1. Action-characteristic model of entrepreneurship and its level (Frese & Gielnik, 2014)

Entrepreneurial Potential in a Bibliometric Review: Undergraduate Students as Future Entrepreneurs

The current approach of entrepreneurship that also analyses personal characteristics and development of those attributes in undergraduate students is called entrepreneurial potential (Sexton & Bowman, 1983; Thompson, 2004). Considering that most of the undergraduate students are not actual entrepreneurs, it may be useful to conceptualize the latent personal characteristics and competencies to generate new business of that group as potential entrepreneurs (Simanjuntak, Awwaliyah, Hayati, & Artanto, 2016). In other words, potential derives from the idea that every individual may be an entrepreneur someday if the latent cognition and affectional states are nursed in a context that may facilitate the expression of those characteristics (Krueger & Brazeal, 1994; Palmer, 1971).

Worldwide this contribution can be substantial, once entrepreneurial potential studies show diversity on its themes and approaches, but lack of qualifying the agenda

focusing on ethical policy and governance, especially on personal and social development (Alvedalen & Boschma, 2017; Leitch, Hill, & Harrison, 2010). Mainly, the international literature of entrepreneurial potential covers entrepreneurship process and its economic influence, social and individual roles in generating new business, innovation in a diversity of potential entrepreneurs as in Figure 2.

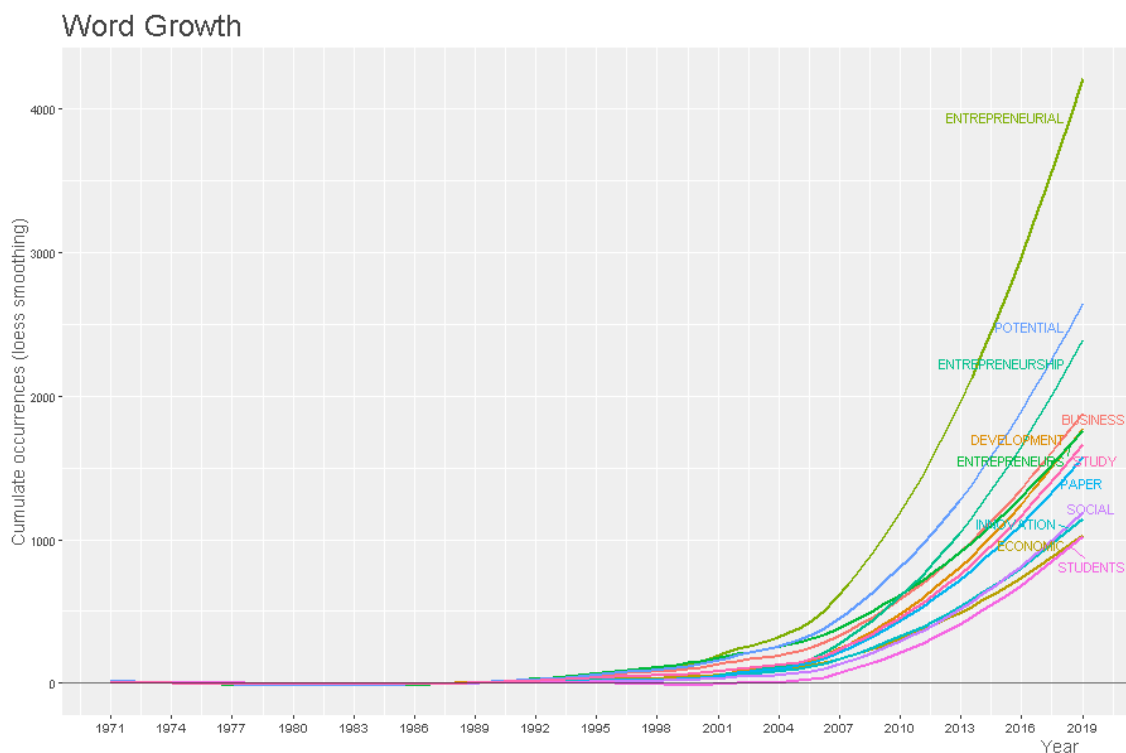


Figure 2. Word growth by frequency in entrepreneurial potential literature worldwide

It is possible to visualize it by analyzing the international literature of entrepreneurial potential. For that, we performed a citation index extraction of 2402 studies retrieved from Web of Science (WOS) due to its high reliability to multidisciplinary citation data collection (Mongeon & Paul-Hus, 2016; Prins, Costas, Van Leeuwen, & Wouters, 2016). In the WOS, we used the boolean operator “(TOPIC:(entrepreneur* AND potential)).” No prior time definition had been proposed, but the base indicated that studies were published from 1971 to 2019. Data Lotka’s Law indicates the distribution between authorship and frequency of publication, which can be used to infer the development level from a corpus of publication. In the current bibliometric review, adjustment to the document’s frequency distribution were $\beta = 3.760$

($p = .087$). It indicates an increased number of authors publishing a high number of documents and just a small number of authors publishing a diversity of documents in the percentile under 25% (Kyvik, 1989). The R package “bibliometrix” in R 3.6.0 was used for that data analysis (Aria & Cuccurullo, 2017). Lotka’s distribution for international literature is shown in Figure 3.

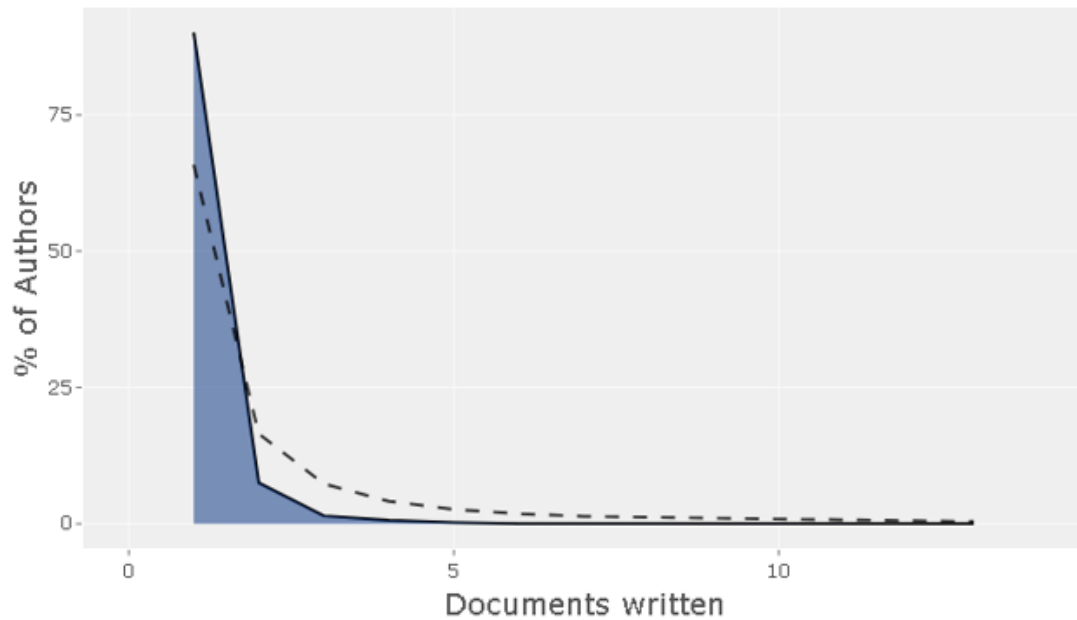


Figure 3. Lotka’s distribution to entrepreneurial potential international literature

It indicates that the entrepreneurial potential approach worldwide seems an established field with many authors authoring recurrently. Also, with the use of “bibliometrix” R package, a conceptual structure map with multidimensional scaling was created after generating a data matrix of co-occurrence of words between those 2402 peer review papers. There were identified six core topics: 1) firms’ growth (Wong, Ho, & Autio, 2005); 2) economic capital and innovation (Baum & Silverman, 2004) ; 3) data analysis-oriented models (Zott & Amit, 2007); 4) contextual aspects and future outcomes (Rauch, Wiklund, Lumpkin, & Frese, 2009); 5) purpose and implications (Johansson, 2004), and 6) entrepreneurial education and students entrepreneurial potential (Caetano, Santos, & Costa, 2012). For the current thesis, the union between ideas of 5) purpose and

implications on 6) entrepreneurial education and student's entrepreneurial potential seem useful what will be explored later as disposed of in Figure 4.

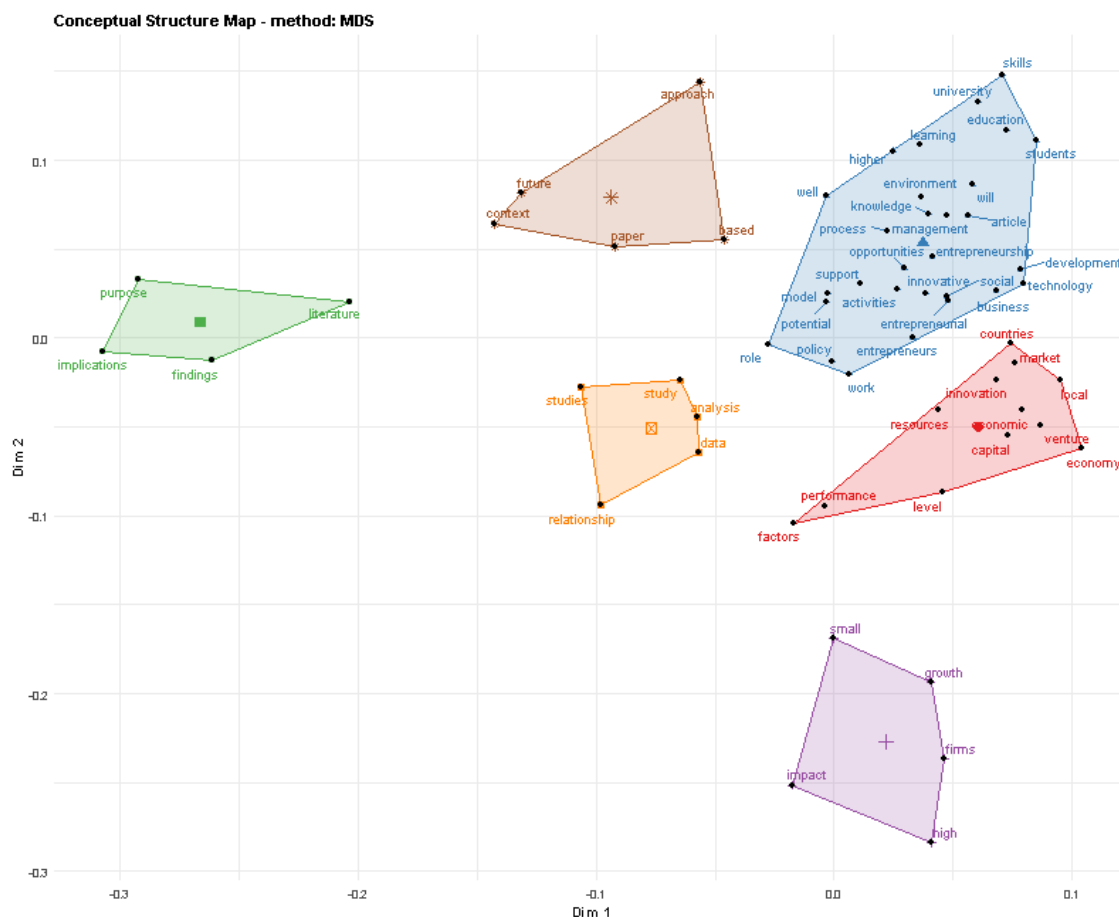


Figure 4. Conceptual structure map of entrepreneurial potential literature worldwide

Focusing on the local level, in Brazil and Latin America, this contribution is also fundamental, probably even more than in the international scope because our local entrepreneurial potential studies seem restricted when compared to the variety expressed in the international literature. We replicated the same bibliometric analysis, did a priori with international literature, but now with a citation index retrieved in Scielo database because of its reliability to recover citation information from Brazil and Latin America (Meneghini, 1998; Miguel, 2011). We applied in Scielo the boolean operator “(TOPIC:(entrepreneur* AND potential))” and recovered 77 studies from 2007 to 2019. Using the R package “bibliometrix” in R 3.6.0, we identified only two topics core topics in the local literature: 1) social model development (Marquesan & Figueiredo, 2014) and

2) students entrepreneurial potential (Cabana-Villca, Cortes-Castillo, Plaza-Pasten, Castillo-Vergara, & Alvarez-Marin, 2013) as demonstrated in Figure 5.

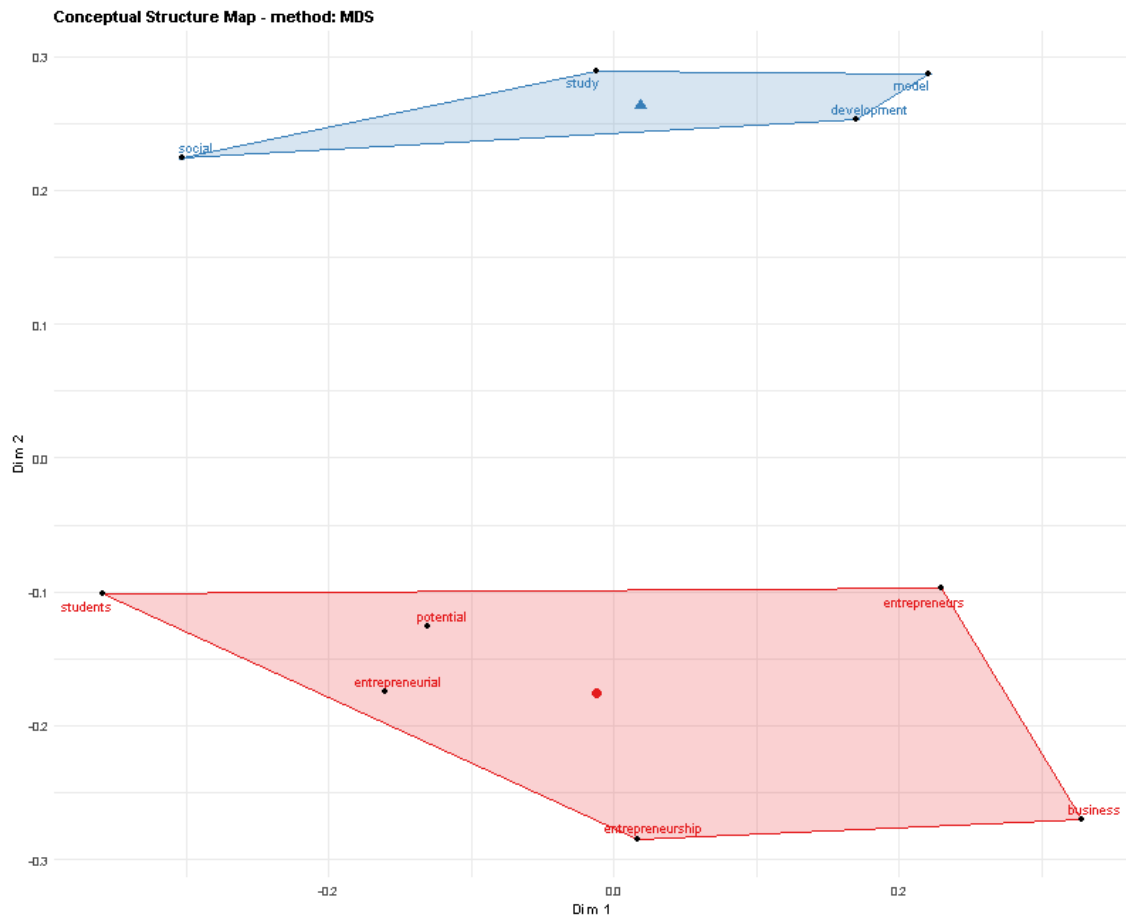


Figure 5. Conceptual structure map of entrepreneurial potential literature in Brazil and Latin America

When contrasting bibliometric indexes like Lotka's Law, the limitation of local entrepreneurial potential literature (Brazil and Latin America) is even more perceptible. The international adjustment was $\beta = 3.760$ ($p = .087$), while the local was $\beta = 4.211$ ($p = .510$) indicating a higher discrepancy of Lotka's law in the local literature, taking in account the low number of established authors and a small number of publications by those established (Kyvik, 1989). Lotka's distribution for local literature is shown in Figure 6.

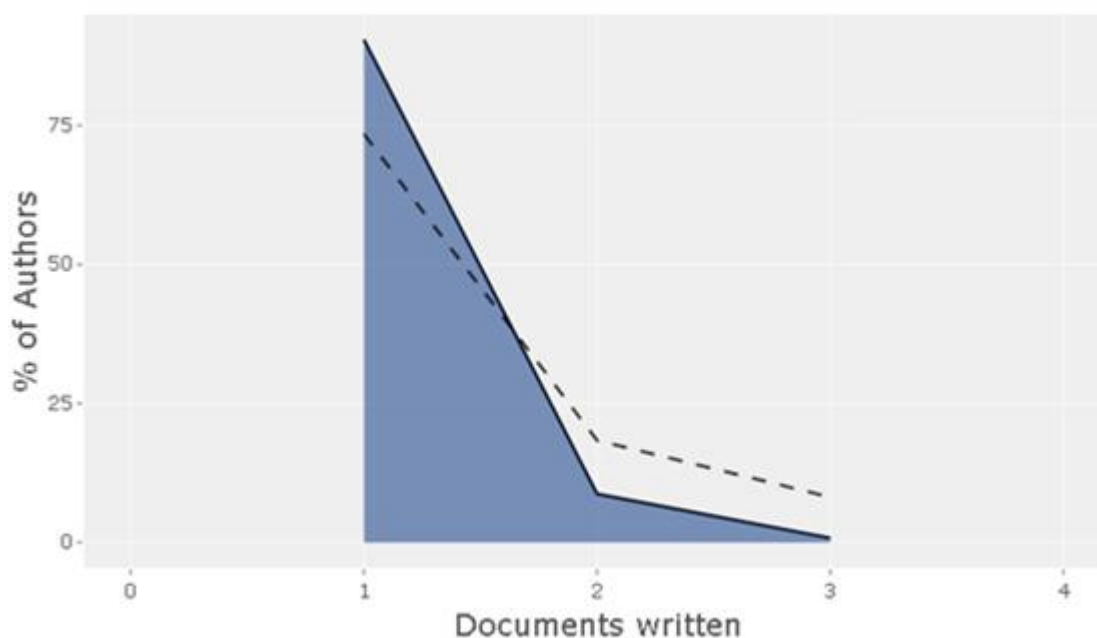


Figure 6. Lotka's distribution to entrepreneurial potential literature in Brazil and Latin America

As evidenced in the bibliometric review, the local literature seems limited in two aspects, due to the low number of substantial established contribution and the low thematic diversity among local studies. The word growth evolution between 2007 to 2019 to the local literature also evidenced that our production seems like a minor and late replica of international entrepreneurial potential literature. Minor due to its lower frequency when compared to the frequency of publication in international literature predominant by European and North American authors. Also, late because the linear evolution of word growth seems to have a delay for like ten years for the themes when also contrasting its evolution with the word growth analysis from the international literature. The local word growth evolution to Brazil and Latin America can be seen in Figure 7.

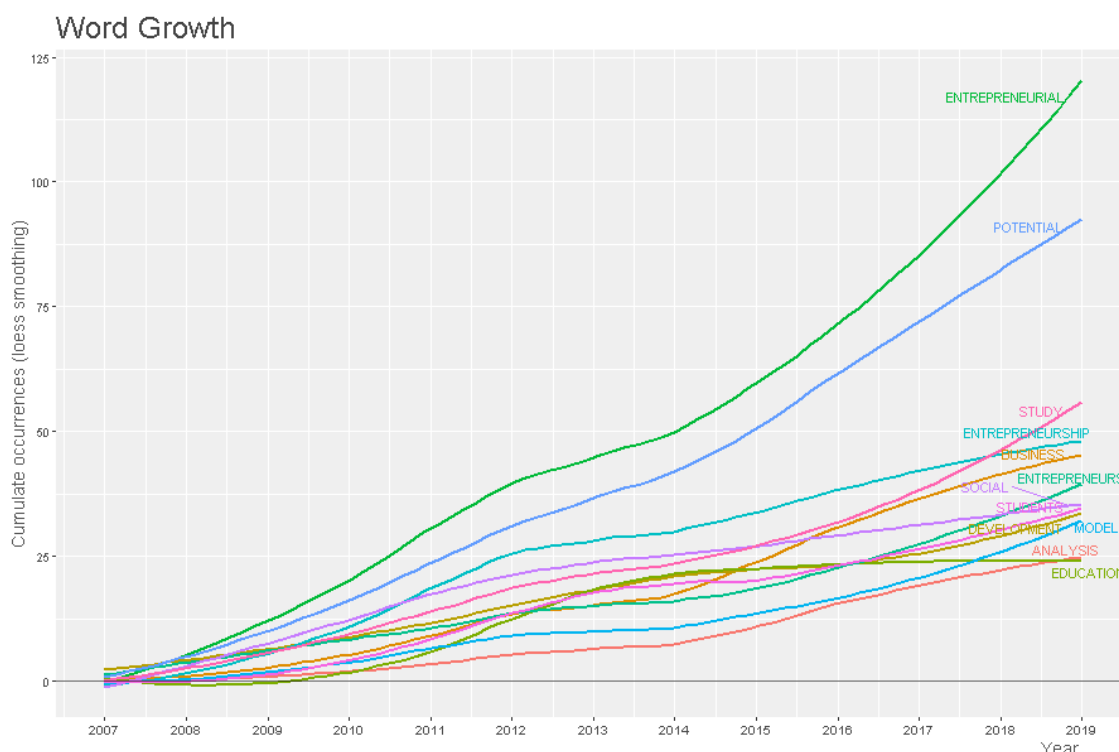


Figure 7. Word growth by frequency in entrepreneurial potential literature in Brazil and Latin America

When reuniting the citation index from Web of Science of international literature and Scielos' from Brazil and Latin America in one data of cooccurrence the dynamics of knowledge about entrepreneurial potential seems more evident in a spatial explanation, also generated with R package "bibliometrix" in R 3.6.0. North America, Europe, Asia and Oceanic demonstrate an elevated amount of publications and connections, while Latin America, including Brazil, and Africa face almost a blackout of connections and publications in the entrepreneurial potential literature. For that reason, further developments about the entrepreneurial potential in Brazil and Latin America should not only improve its basis and consistency but also would be better if that were derivated from integrating insights and connections from international literature, as it seems the high-efficiency practice in that research field. It is demonstrated when analysing co-citation matrix between papers from different countries in Figure 8.

Country Collaboration Map

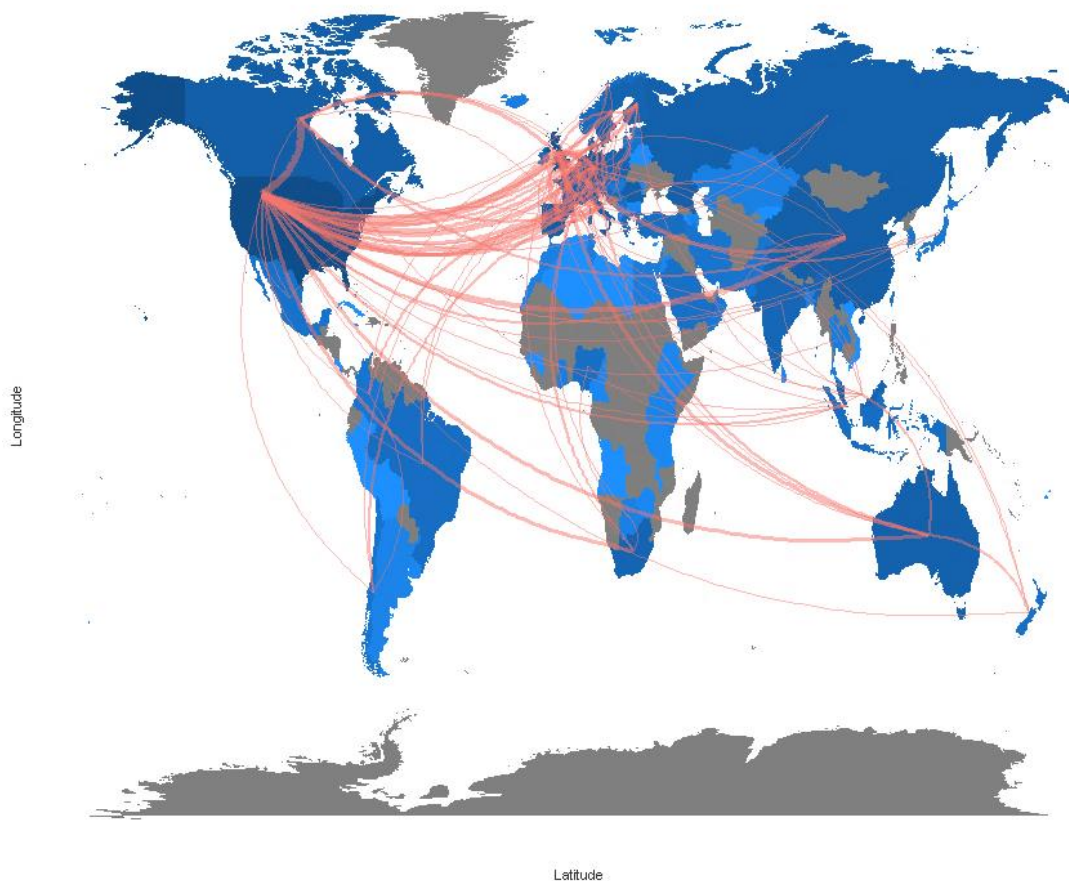


Figure 8. Countries' collaboration and connections between documents on entrepreneurial potential literature

Note. Darker Blue = High frequency of publication; Lighter Blue = Minor frequency of publication; Grey = No contribution identified; Lines = Connections between authors in the same paper considering co-citation matrix.

In order to conceptualise a worldwide connected contribution from Brazil and Latin America, it is fundamental to recover the previous information that the union between ideas of purpose and implications on entrepreneurial education and student's entrepreneurial potential can be useful in further development. It is essential because it highlights the central approach of this thesis to overcome the status of a disconnected late replica of international entrepreneurial potential literature, usually implemented by Latin American and Brazilian authors (Costa, 1995; Smith, 2018).

As a new personal developmental and social policy for the entrepreneurial potential, the international literature offers concepts to analyse entrepreneurship purpose and implication, but it is a detached thematic core, as demonstrated before. In the current thesis, the reunion between those topics relies upon the idea that entrepreneurial potential among undergraduate student could focus on the quality of entrepreneurial potential to differentiate between ethical and unethical entrepreneurship, health and unhealthy practices in order to contribute in a positive personal and social development agenda under its influence (Belz & Binder, 2017; Hannafey, 2003; Sarasvathy & Venkataraman, 2011; Zahra, Gedajlovic, Neubaum, & Shulman, 2009).

It is essential to differ the thesis contribution of a positive personal and social development agenda in entrepreneurial potential from the local influence of social entrepreneurship in Brazil and Latin American literature identified prior in the bibliometric analysis. Social entrepreneurship in the local influence seems a historic cultural critical approach that considers its focus on no-profit organisations to overcome inequality and poverty (Baggenstoss & Donadone, 2012; Chell, Spence, Perrini, & Harris, 2016; Costa, Barros, & Carvalho, 2011; Dacin, Dacin, & Tracey, 2011; Oliveira, Moita, & Aquino, 2016).

In the current thesis, the conception of positive personal development is influenced by Stephan (2018) that is associated with the promotion of well-being and mental health among entrepreneurs, while the social development core ideas derive from Parente et al. (2018) model of humane entrepreneurship as an ethical epistemology. Both models seem crucial to entrepreneurial potential literature, once it may impact on positive outcomes of future entrepreneurship, in order to guide students entrepreneurial process through a validation model that settles on personal and social development as primary goals.

For that reason, in this thesis, personal development is comprehended as the predominance of conditions that promote mental health and well-being in different contexts. Mental health is a state of regulation that implies in cope with daily life and productivity in regular tasks (World Health Organization, 2004). Well-being is conceptualized as a hedonic (positive affect) and eudemonic (self-actualization) state (Ryan & Deci, 2001). Social development relies on humane entrepreneurship as ethics, focused on entrepreneurial orientation (Covin & Slevin, 1991; D. Miller, 2011), human resources orientation (Ferris et al., 2002) and sustainability orientation (Lumpkin, Moss, Gras, Kato, & Amezcua, 2013) from different agents to achieve a societal improvement on individuals' life, environmental conditions, market, and regulatory dynamics.

In conjunction, those thesis contributions could be applied to private and public organization, profitable and non-profitable organizations not only to overcome inequality and poverty but also to improve concepts and practices like organizations governance and its implications in public and private institutions (Bicho, Nikolaeva, & Lages, 2019; Johanisova, Crabtree, & Fraňková, 2013; Zahra & Wright, 2016). At this thesis, it can also be called as a triad basis on entrepreneurial potential, once it focuses on humanized ethics, mental health, and well-being.

It is also imperative to derivate the conceptual ideas from a broader approach connected with the international influence, because there is evidence converging with the bibliometric analysis from previous Brazilian literature reviews that also demonstrated at our local level the entrepreneurship approach as limited, in need to improve its theoretical and empirical evidence (Borges-Junior, Andreassi, & Nassif, 2017; Cortez & Veiga, 2018). Considering the international literature that derivation is also a contribution worldwide, once entrepreneurial potential seems a more developed approach, but do not consider quality aspects like entrepreneurial motives that can impact the outcome of

potential entrepreneurs (Klotz & Neubaum, 2016). In that perspective, the current thesis impacts local and worldwide in the entrepreneurial potential approach.

Specifically, it aims to impact in two focus. The first, consider the improvement of measurement models used in the thesis when compared to the international alternatives that also contribute to instruments for the assessment of entrepreneurship among undergraduate students in Brazil. For that, we rely on the use of classical and modern psychometrics methods, like factor analysis, bifactorial analysis, and genetic algorithm to investigate psychometric properties of scales and control response bias. Those methods are not currently included in the entrepreneurship proposal of measurement but influence positively in the formulation of personal indicators and its accuracy in predictive models as shown in previous literature indications for that purpose (Aichholzer, 2014; Danner, Aichholzer, & Rammstedt, 2015; Paunonen & LeBel, 2012). In the theoretical and applied aspects, the thesis includes the triad basis of humanized ethics, mental health, and well-being approach, after testing an empirical model to explain entrepreneurial intention considering entrepreneurial motives and psychopathy, to guide future entrepreneurial potential studies and practices among undergraduate students.

In our studies, we focus only on personal aspects in order to contribute to psychological comprehensions, once there is a substantial influence of personal characteristics to explain entrepreneurship outcomes (Siebert & DeGeest, 2015; Hao Zhao, Seibert, & Lumpkin, 2010). To do that so, we opted to focus on entrepreneurial motives and entrepreneurial intention, once those aspects seem central for the development of a humanized ethical, healthy, and positive agenda to entrepreneurial potential literature (Fayolle, Liñán, & Moriano, 2014; Stephan, Hart, & Drews, 2013; Zahra et al., 2009). It is essential to focus on a deep comprehension of those attributes to advance about how those ideas can contribute to Brazil and worldwide in the entrepreneurial potential approach.

Core Definitions: What are Entrepreneurial Motives?

Entrepreneurial motives are the conjunction of reasons that motivates individuals to start their own business. Each motive, as an individual personal cognition, designates one contextualized reason that drives individuals to take action in favor of one direction instead of others (Kuhl, 1987). When taking into account together, those reasons can designate and qualify the individuals' motivational interest along the entrepreneurial process (Gartner, Bird, & Starr, 1992). This dynamic relies on the preliminary idea of motivation conceived that individuals' behaviours are preceded by intentions that are influenced by motivational aspects, personal cognitions and personality (Peters, 1956).

Different conceptions have already emphasised individuals' motives and the motivational process along entrepreneurs. Some of those focus on the impacts of new venture to society, considering that entrepreneurs values usually disseminate as core concepts to organisations practices (Gielnik, Frese, Bischoff, Muhangi, & Omoo, 2016; Holmén & McKelvey, 2013; Parker, 2004) while others comprehend the psychological process and dynamics from individuals and contexts that drive the expression of efforts and behaviours in the venture creation (Fellnhofer & Puumalainen, 2017; González & Rivera, 2017).

If there is a unifying element between those two comprehensions is the idea of positive and negative influences on the motivational process. For society, negative entrepreneurial motives can be catastrophic for human development with the raising of negative governance and inequalities (Mas-Tur, Pinazo, Tur-Porcar, & Sánchez-Masferrer, 2015; Tedmanson, Verduyn, Essers, & Gartner, 2012). For individuals the negative entrepreneurial motives process usually drives into a lousy expression of its entrepreneurial potential that can be harmful to himself and his co-workers in the long

term (Antony, Klarl, & Lehmann, 2017; Kostetska & Berezyak, 2014; Mair & Marti Lanuza, 2006).

The theoretical understandings about the entrepreneurial motives are mainly based on Baumol (1996) proposal that theorized the relationship between individuals and situational aspects that motivate the entrepreneurial process. For the author, there are three central reasons for the individual to become an entrepreneur: a. Accumulate capital by indirect means, such as investments, without the direct proposition of a new venture in the material reality; b. Generate wealth through the creation of a real business with exploration of social value; c. Generate wealth through the real proposition of one business that also adds value to people and society.

For Baumol (1996) in cases where the individual is concerned exclusively with the accumulation of capital with financial investments, entrepreneurship is assumed to be destructive, because without the proposition of a real venture the profit comes from the exploitation of another activity that, initially, generated the capital. When an individual seeks to generate wealth through a real enterprise but does not care about externalities and social impact, it is an unproductive motive, since the individual's focus on exploring resources and human capital to generate own wealth, without consideration of the indirect effects caused by the execution of that activity. That indirect effect is called an externality. Finally, when the entrepreneurial activity involves a real business and spread social value, with the entrepreneur worrying about the indirect effects of the organization activity, it may result in productive entrepreneurship.

Some minor criticism exists about Baumol elaboration, mainly from economic authors that focus on speculative financial process as an ethical and essential type of wealth development (Renneboog, Ter Horst, & Zhang, 2008; Revelli & Viviani, 2015), which is not consensus when considered those critical groups that study financial capital movement and its inequality effects on emerging countries (Park, 2019; Thiem, 2017).

In the current study, we rely upon the general acceptance that analyses the entrepreneurial motives considering its psychosocial purpose and impacts on the individual's and collective's daily life. Once, as a psychosocial attribute, that comprehension seems enough for an analytical approach by the lens of psychology (Levine & Rubinstein, 2017).

Emphasizing the psychosocial dimension, specifically what drives the individual to be motivated by socially unproductive or productive entrepreneurship, there is the proposal of Hmieleski and Lerner (2016). In the authors' proposal, individuals may be interested in becoming entrepreneur by aiming to contribute to the creation of value and social welfare when productively motivated or focusing on personal gains and profits with the use of human and social resources, which is named as unproductive motives. The combination of these motives results in a personal motivational style that boosts the subject towards the realization of his own business, whether socially productive or unproductive (Carsrud & Brännback, 2011).

It is noteworthy that in the measurement proposal of Hmieleski and Lerner (2016), socially destructive entrepreneurship was not analysed, but do not seem a problem for the current study. In Baumol (1996), this kind of entrepreneurial motive can be exemplified primarily by rentiers, speculators and other individuals who are considered financial entrepreneurs. For that reason, Baumol's definition of destructive entrepreneurship does take in account a real business generation which does not impair the comprehension of entrepreneurial motives of the current study that focus on motives for real business generation by an individual.

Because of this, the theoretical conception of Baumol (1996) proposed as psychological instrument by Hmieleski and Lerner (2016) is adequate to understand the entrepreneurial motives among undergraduate students. It covers a clearly described motivational typology that emphasizes the main reasons related to the proposition of own business by individuals. Moreover, the theoretically robust operationalization of the

authors to evaluate the socially productive and unproductive motives made it possible to include this measurement model in the present project. This measure is called Entrepreneurial Motives and presents adequate levels of psychometric indicators regarding internal structure and reasonable internal consistency indices per factor, supporting on an empirical perspective its importance to the current thesis (Hmieleski & Lerner, 2016).

Core Definitions: What is Entrepreneurial Intention?

Entrepreneurial intention refers to different models that analyse cognitions associated with the personal tendency of an individual aim to create a new business in the near future (Heuer & Kolvereid, 2014; Iakovleva, Kolvereid, & Stephan, 2011). In the present study, the entrepreneurial intention is defined as cognitions that precedes the action of creating a new venture shortly like planning, expectation and pretension of becoming an entrepreneur and generate new business (Rai, Prasad, & Murthy, 2017).

Bird (1988) was one of the core authors in the investigation of this attribute as a cognitive process that precedes the creation of a new business. The author was interested in understanding how the individual directs their attention, experiences and actions to formulate their own business idea. Her main contribution was conceptualizing entrepreneurial intention as a predominantly cognitive and comprehensible variable what created the basis to further explorations of entrepreneurial intention as planned and controllable behaviour.

Shapero and Sokol (1982) were also fundamental to the concept of entrepreneurial intention. The author generated the idea of Entrepreneur Event Model. From this perspective, the entrepreneurial intention would emerge abruptly through the episodic cognitive occurrence that allows individuals to perceive a high chance to generate their own business. The entrepreneurial intention would result from three perceptions:

desirability, viability, and propensity to act. Desirability refers to the individual to evaluate entrepreneurship as something to himself. The viability is characterized as the individual perception about the favourable conditions to create own business in the current environment. The propensity to act results from the synthesis of high desirability and viability to become an entrepreneur. Such perceptions would be triggered by the entrepreneurial event resulting in greater or lesser chances to the individual become an entrepreneur (Segal, Borgia, & Schoenfeld, 2005).

Those two authors provided a substrate for the development of future elaborations on entrepreneurial intention. The notion of entrepreneurial intention proposed by Bird (1988) as a cognition process associated with planned behavior and the factors developed by Shapero and Sokol (1982) supported the application of the Planned Behaviour Theory to understand the entrepreneurial intention. This theory has proved influential in understanding intentional constructs in different domains, presenting high predictive power on beliefs about behavioural volitions that are associated with future behaviours in different research areas (Ajzen, 1991, 2015).

In the field of entrepreneurship, the primary application of the Theory of Planned Behaviour was performed by Krueger and Carsrud (1993) who, to understand the entrepreneurial intention, was inspired by the proposals of Bird (1988) and Shapero and Sokol (1982). Bird's finding that this construct was a planned behaviour substantiated the use of Planned Behavior Theory to comprehend the entrepreneurial intention. Shapero and Sokol's factors enabled Krueger and Carsrud to develop a theoretical model encompassing attitudes, subjective norm, and perception of behavioral control that stills relevant in the field of entrepreneurship to predict behavioral outcomes. For Krueger and Carsrud the confluence between personal beliefs (attitudes), perception of social pressure (subjective norm) and self-control (perception of behavioral control) among the proposition of new business would characterize entrepreneurial intention.

In general, the elaborations of these authors created a solid base to understand the entrepreneurial intention as cognitions, planned behavior and, therefore, guided the literature through analyzing pre-action aspects that result in the possibility of the individual intent to create own business (Frese & Gielnik, 2014). Posteriori, a miscellany of proposals to evaluate the phenomenon was conceived, with a reasonable number of propositions with unique occurrence in the literature. In a review of entrepreneurial intention as a research theme, a research agenda was proposed pointing out to the importance of seeking greater conceptual clarity in the theoretical aspect, which can be achieved by prioritizing the application of robust models (Bird & Schjoedt, 2009).

Bird (2015) highlights Linan and Chen's (2009) measurement proposal like the one with the most significant empirical replication and robustness when considering pre-action characteristics of future entrepreneurs. In this study, the author also identified as alternatives for measuring entrepreneurial intention like Kolvereid (1996), Krueger et al., (2000), and Zhao, Seibert and Hills (2005), but highlighted the fragility of those measurement alternatives because of the difficult to identify a precise theoretical specification to those proposes, which is supported by metanalysis evidence (Schlaegel & Koenig, 2014).

The instrument of Liñán and Chen (2009) operationalizes entrepreneurial intention as a cognitive attribute. It indicates the subjective probability self-reported by the individual about starting own business in the near future. It is noteworthy that this factor fits with the conception of the Planned Behaviour Theory in the field of entrepreneurship and therefore attest to the robustness of the measure in the theoretical aspect (Kautonen, van Gelderen, & Fink, 2015). For this reason, in the present study, entrepreneurial intention was assessed through the Entrepreneurial Intention Questionnaire, which also presented satisfactory psychometric indexes in studies that aimed to demonstrate validity evidences based on content and internal structure for the

instrument among undergraduate students (Liñán & Chen, 2009; Rueda, Moriano, & Liñán, 2015).

Why Entrepreneurial Motives and Entrepreneurial Intention are Important in Entrepreneurial Potential Research?

It is only possible to comprehend the importance of entrepreneurial motives and entrepreneurial intention to the current thesis after a brief presentation about the relations between personality and entrepreneurship in the literature. For the current study, personality is a general term to designate models that deal with fundamental and established individual characteristics (Allport, 1937; Mischel, 2009). Among different personality models, the focus on Big Five and Levenson psychopathy occurs once the first seems established as an important criterion validity in psychometrics and entrepreneurship research and the second captures negative personality traits that can be useful to develop the thesis argument, which will be explained later (Miller, Gaughan, & Pryor, 2008; O’Boyle, Forsyth, Banks, Story, & White, 2015; Paunonen & Ashton, 2001).

Big Five model consists of a typology of personality usually used to the assessment of factors between five dimensions, like openness, conscientiousness, extraversion, agreeableness and neuroticism (Goldberg, 1990). In the psychometric literature, this conception of personality has an extensive range of replication and stability among different cultures and populations that allows its use as criterion validity in different contexts (Corr, 1998; Hamby, Taylor, Snowden, & Peterson, 2015; Specht, Egloff, & Schmukle, 2011). It also shows robustness to the assessment of personality among undergraduate students with different proposes evidencing high reliability and internal structure indexes among that population (Atroszko et al., 2018; Komarraju, Karau, & Schmeck, 2009; Richardson, Abraham, & Bond, 2012; Vedel, 2016).

In the entrepreneurship literature, there is evidence that Big Five correlates with entrepreneurial attributes as positive in openness, conscientiousness, extraversion, agreeableness and negative with neuroticism (Brandstätter, 2011; Leutner, Ahmetoglu, Akhtar, & Chamorro-Premuzic, 2014; Schmitt-Rodermund, 2004). We opted to use Brazilian Big Five Short Markers, due to its psychometrics positive evidence among undergraduate student what allows its use as criterion validity when correlated with entrepreneurship instruments (Hauck, Machado, Teixeira, & Bandeira, 2012; Machado, Hauck, Teixeira, & Bandeira, 2014).

Psychopathy is conceived as a conjunction of undesirable personal characteristics. Some of those characteristics are a tendency to interpersonal exploitation, emotional deficits, impulsivity and lack of remorse and usually predict negative behavioural outcomes (Hauck Filho, Teixeira, & Dias, 2012; Skeem, Polaschek, Patrick, & Lilienfeld, 2011). In the current thesis, that concept is fundamental, once it indicates a negative personal characteristic, usually opposed to the idea of mental health and well-being conceived in the triad basis, specially with secondary psychopathy (Love & Holder, 2014). Levenson's model is used once it relies on a non-psychopathological comprehension of psychopathy that is adequate to undergraduate students. In Levenson, Kiehl, and Fitzpatrick (1995) conception, primary psychopathy is associated with interpersonal and affective elements such as grandiosity, interpersonal manipulation, and lack of remorse and guilt; secondary psychopathy is associated with deviant behaviors such as delinquency, impulsivity, and emotional instability.

Once the current literature of entrepreneurship lack on a measurement of entrepreneurial well-being (Wiklund, Nikolaev, Shir, Foo, & Bradley, 2019), that could directly test the association between entrepreneurship and the triad basis, we relied on established Levenson et al. (1995) personality conception that can be useful when correlated with entrepreneurship instruments and attributes to offers insights to think

about undesirable characteristics of future entrepreneurs when considering its relation with psychopathy (Akhtar, Ahmetoglu, & Chamorro-Premuzic, 2013; El Harbi, Grolleau, Sutan, & Ben Ticha, 2019; Hmieleski & Lerner, 2016; Hao Zhao et al., 2010). To do that so, we selected LSRP – Levenson Self-Report Psychopathy Scale – Brazilian Version (Hauck & Teixeira, 2014) due to its psychometrics qualities to the assessment of psychopathy in Levenson, Kiehl, and Fitzpatrick (1995) conception among Brazilian undergraduate students.

Recapping the importance of personality and the current development of the thesis, Big Five is essential, because it can serve as a criterion marker of psychological aspects. Considering that entrepreneurial motives and entrepreneurial intention instruments were not available in Brazilian Portuguese, it was used to secure that the instruments' cultural adapted internal structure was optimal when analysing its relation with external variables (Kline, 2015; Pasquali, 2017; Primi, 2012). Psychopathy relevance in the entrepreneurship literature is quite smaller when we consider previous evidence generated to Big Five model, but there is an emerging that shown a substantial correlation between negative entrepreneurship outcomes and psychopathy (Haynes, Hitt, & Campbell, 2015; Klotz & Neubaum, 2016; Tucker, Lowman, & Marino, 2016).

The current thesis focused on that emerging movement, because different studies demonstrated the relations between entrepreneurship and personality, mainly using Big Five as a predictor of entrepreneurial intention, business development and market innovation, but hardly tried to qualify entrepreneurship in order to comprehend why someone would personally become an entrepreneur (Krueger, 2017). For that reason, it stills obscure the reasons of an individual opt to become an entrepreneur or what type of values, personal cognitions and characteristics are antecedents of entrepreneurship and its outcomes (Fellnhöfer & Mueller, 2018; Kwong & Thompson, 2016; Leitch & Harrison, 2016).

Some studies showed that the understanding of the motivational aspects related to the entrepreneurship is fundamental because the purpose of the organizations and its ethical impacts are associated with the motives and values advocated by the founding entrepreneur (Brieger, Terjesen, Hechavarría, & Welzel, 2018; Kraus, Berchtold, Palmer, & Filser, 2018; Riquelme & Lanqawi, 2016). To do that so, it is usually essential to analyse the individual or interpersonal principles that, primarily, drive human behaviour individually and in society and organizations (Wachelke & Rodrigues, 2015; Zahra et al., 2009).

Despite that importance, there is a remarkable gap between entrepreneurship and personality about those topics, which the current thesis aimed to contribute considering the triad basis of humanized ethics, mental health and well-being as crucial development to entrepreneurship research and practices (Parente et al., 2018; Stephan, 2018). Those variables may optimize individuals “(...) experience of satisfaction, positive affect, infrequent negative affect, and psychological functioning in relation to developing starting, growing and running an entrepreneurial venture (Wiklund et al., 2019, p.1)” with positive outcomes to the entrepreneur, co-workers and the whole society. Based in that notion, entrepreneurial potential development may foster social productive, healthy and positive entrepreneurship, mainly in underdevelopment countries like Brazil where inequality, corruptive governance and exploit is the typical social practice, in order to contribute to a positive social change at those contexts (Filgueiras, 2009; Silva, França, & Pinho-Neto, 2016).

We consider especially controversial if entrepreneurial potential literature, specifically entrepreneurial intention and entrepreneurial motives attributes, seems more related to unproductive entrepreneurial motives and psychopathy traits, that may not be socially desirable for the positive human and social development (Muris, Merckelbach, Otgaar, & Meijer, 2017; Smith & Lilienfeld, 2013). It would urge as evidence of

inefficacy for the current approach of entrepreneurial potential and reveal its evaluative gaps that may foster further emergency comprehension like the triad basis developed in the current thesis. For that reason, it is essential to test the relation between those variables to make sure that the current neutral approach of entrepreneurial potential is related to productive or unproductive values of entrepreneurship among undergraduate students (Fellnhofer, Puumalainen, & Kunttu, 2017; Vuorio, Puumalainen, & Fellnhofer, 2018).

In the thesis, we basis our concept of positive human development as a new core agenda for entrepreneurial potential approach (Wiklund et al., 2019). Based on this agenda, we considered relevant study the psychometric properties of entrepreneurial motives and entrepreneurial intention, as it seems crucial attributes to understand the relationship with personality as an indicator of that research and practice field predominant values (Hmieleski & Lerner, 2016; Liñán & Chen, 2009). We also appreciated as necessary the comprehension of the relations between entrepreneurial motives, entrepreneurial intention and psychopathy, because it can illustrate in an explanation model what motives drive the entrepreneurial intention, how those motives are related to psychopathy traits – as an evaluative indicator of negative personal characteristics – and how they predict entrepreneurial intention.

The focus in the entrepreneurial intention as an outcome variable in the model relies on the practices of entrepreneurial potential approach that consider this variable a relevant predictor of future entrepreneurship among students. So, it is possible to infer some hypothesis about the evaluative type of future entrepreneur behaviour by exploring these variables and their relation with psychopathy (Tornikoski & Maalaoui, 2019; Vuorio et al., 2018; Wang, Lin, Yeh, Li, & Li, 2016). Next, we advance in the triad basis of future development that drives the current thesis.

The Triad Basis to the Entrepreneurial Potential Approach: Entrepreneurship as Policy Making and Future Agenda for Personal and Social Development

In order to formulate the triad basis as possible social policy, we focused on the idea that entrepreneurship should be humanized ethical, health and well-being oriented in order to grant potential entrepreneurs' conditions to disseminate those aspects among institutions to allow a society with a predominance of positive human and social development (Parente et al., 2018; Stephan, 2018; Wiklund et al., 2019). If psychopathy aspects can explain entrepreneurial motives and predominantly the entrepreneurial intention, so it is possible to infer the necessity of an emergency comprehension in entrepreneurial potential literature, like the triad basis of humanized ethics, well-being and health, to impact in a future agenda of positive entrepreneurship and its outcomes as social policy (Brieger et al., 2018; Zahra et al., 2009; Zahra & Wright, 2016) . To contribute in an evidence-based model that may contribute to demonstrate the inefficacy of current entrepreneurial potential neutral approach to developing that triad basis conception in Brazil, we first cultural adapted entrepreneurial intention and entrepreneurial motives scale and, next, tested the theoretical model as proposed in Figure 9.

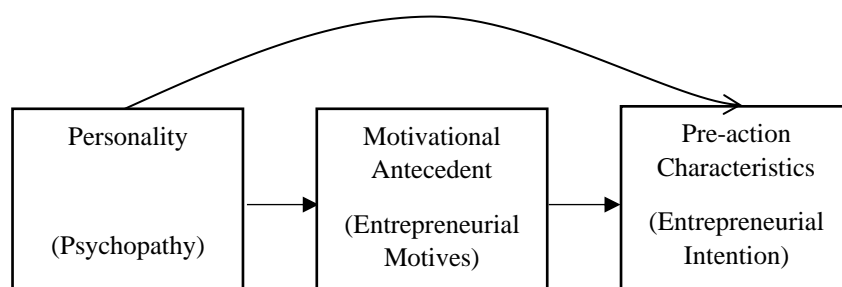


Figure 9. Action-characteristic model of entrepreneurship (Frese & Gielnik, 2014)

The test of this model is when psychology, psychometrics, and policy-making converge in this thesis as an effort to demonstrate that the current neutral entrepreneurial potential approach may enhance the gap about individuals' motivational antecedents and pre-action characteristics in the entrepreneurship literature by fostering entrepreneurial attributes associated with negative characteristics like psychopathy. In that perspective, entrepreneurship is an object for psychology when personal attributes are clearly demonstrated as relevant for the entrepreneurial process and its outcomes (Frese & Gielnik, 2014; Veiga, Demo, & Neiva, 2017). Entrepreneurship is also a psychometric object when modern methods and psychological instrument seems reliable and important to optimize the entrepreneurship literature and impact on its developments (Aichholzer, 2014; Danner et al., 2015; Paunonen & LeBel, 2012).

In that dynamic, entrepreneurship is policy-making by the union of psychology and psychometrics when the psychological theoretical contribution and psychometrics methods and instruments possibility to that research field new conditions and insights to boost individual's entrepreneur potential in an humanized ethical, health and well-being manner that implies on personal and social development (Aeeni, Motavaseli, Sakhdari, & Dehkordi, 2019; Alvedalen & Boschma, 2017; Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017). For now, it is crucial to comprehend that the studies of the current thesis focus to impact in the Brazilian propose to assessment potential entrepreneurs' characteristics, once the actual literature and instruments for that objective lack on empirical evidence for further developments that can improve the comprehension of entrepreneurship, in order to foster a triad basis (humanized ethics, mental health, and well-being) social policy in our local level (Borges-Junior et al., 2017).

Considering the international level, the thesis aims to impact in two focus. The first, consider the improvement of measurement models used in the thesis when compared to the international alternatives (Hmieleski & Lerner, 2016; Liñán & Chen, 2009). For

that, we rely on the use of psychometrics methods to analyse and improve the measurement model of entrepreneurial motives and entrepreneurial intention by controlling different response style and method bias. Those technical approaches are not currently included in the entrepreneurship proposal of measurement, but impact positively in the formulation of personal indicators and its accuracy in explanatory models (Eisenbarth et al., 2015; Podsakoff et al., 2012). The second aims to impact in the theoretical and applied aspects, which includes the triad basis of humanized ethics, mental health and well-being approach to guides entrepreneurial potential studies as a research and practical field (Parente et al., 2018; Stephan, 2018).

Chapter 2

Studies Overview

There are three studies in the current thesis in order to achieve the general objective. The first and second studies proceed the cultural adaptation and test of psychometric properties of entrepreneurial motives and entrepreneurial intention scales. Next, the third study tests an empirical model to check the relationship between entrepreneurial motives and entrepreneurial intention considering psychopathy as a predictor of those attributes. The first two studies offer an instrumental condition to test the empirical model that further have its evidence contrasted in the theoretical background of the current thesis to guide additional advances in entrepreneurial potential comprehension among undergraduate students.

General Objective

- Propose evidence to the measurement of potential entrepreneurs' characteristics with Brazilian undergraduate students and test an evidence-based model to guide the development of entrepreneurial potential investigations and practices among that public.

Specifics Objectives

- Proceed with the cultural adaptation and test the psychometric properties of entrepreneurial motives scales.
- Develop the cultural adaptation and test the psychometric properties of entrepreneurial intention scale.
- Test the relations between entrepreneurial intention and entrepreneurial motives, considering psychopathy as a predictor.

Study A – Paper 1: Cultural adaptation and internal structure for entrepreneurial motives and its relation with Big Five

Abstract

We investigated the internal structure, and criterion validity for entrepreneurial motives scales with 660 Brazilian undergraduate students in order to improve the assessment of motivational characteristics of potential entrepreneurs. The internal structure is shown adequacy and criterion validity for an exploratory factor analysis model with two factors but lacked reasonable interpretation and criterion validity for the second model of factor analysis with a method factor. The optimal internal structure was proposed by a brief version of the instrument generated with a genetic algorithm that also obtained the best indexes for criterion validity when correlating it with others structure of the present instrument and Big Five. We contribute with new evidence to assess entrepreneurial motives in Brazilian undergraduate student and a new internal brief structure for the instrument that could be further explored in other contexts.

Keywords: motivation, personality, bias, entrepreneurship, psychometrics.

Resumo

Investigou-se a estrutura interna e a validade de critério para a escala de motivos para empreender com 660 estudantes brasileiros de graduação, a fim de melhorar a avaliação das características motivacionais em potenciais empreendedores. A estrutura interna mostrou adequação e validade de critério para um modelo de análise fatorial exploratória com dois fatores, mas careceu de uma interpretação razoável e validade de critério para o segundo modelo de análise fatorial com um fator de método. A estrutura interna otimizada foi proposta por uma versão breve do instrumento gerada com algoritmo genético que também obteve os melhores índices de validade de critério ao correlacioná-lo com outras estruturas do presente instrumento e ao Big Five. Com o estudo, possibilitam-se novas evidências para avaliar os motivos para empreender de estudantes brasileiros de graduação e uma nova estrutura interna breve para o instrumento que pode ser útil explorar a adequação para avaliação em outros contextos.

Palavras-chave: motivação, personalidade, viés, empreendedorismo, psicometria.

Resumen

Investigamos la estructura interna y la validez de criterio para la escala de motivos emprendedores con 660 estudiantes universitarios brasileños para mejorar la evaluación de las características motivacionales de los potenciales emprendedores. La estructura interna mostró adecuación y validez de criterio para un modelo de análisis factorial exploratorio con dos factores, pero desprovisto de interpretación razonable y validez de criterio para un segundo modelo de análisis factorial con un factor de método. La estructura interna óptima fue propuesta por una versión breve del instrumento generado con algoritmo genético que también obtuvo los mejores índices de validez de criterio al correlacionarlo con las otras estructuras del presente instrumento y Big Five. Contribuimos con nueva evidencia de evaluación de los motivos empresariales en estudiantes universitarios brasileños y una nueva estructura interna breve para el instrumento que podría explorarse más en otros contextos.

Palabras clave: motivación, personalidad, sesgo, emprendedurismo, psicometría.

What drives entrepreneurial behaviour is a worthy question once it may impact future entrepreneurship outcomes (Ireland, Covin, & Kuratko, 2009; Read, Song, & Smit, 2009; Walter & Block, 2016). In the entrepreneurial potential literature – a multidisciplinary approach that seeks to discover how to boost individuals' attributes to entrepreneurship – the comprehension of entrepreneurial motives may lead to answers about how to generate new companies in a healthy, ethical and well-being direction (Chell, Spence, Perrini, & Harris, 2016; Chernysheva & Shepelenko, 2017; Cortez & Veiga, 2018; Krueger & Brazeal, 1994; Thompson, 2004). In Brazil, it usually emphasises on undergraduate students, once national entrepreneurial and innovation ecosystem efforts seem restricted to universities (Campelli, Casarotto-Filho, Barbejat, & Moritz, 2011; Fischer, Queiroz, & Vonortas, 2018; Schaefer & Minello, 2016).

Focusing on the economic approach, Baumol developed some considerations about how entrepreneurs drive their companies in different situations and its influence in different contexts. Part of those comprehensions can be synthesised as productive and unproductive entrepreneurship (Minniti, 2016; Sobel, 2008). Productive entrepreneurship focuses on generating social value and spread the wealth collectively as social wellbeing (Baumol, 1996). Unproductive entrepreneurship emphasises the value creation, but with the social exploration and maintenance of wealth exclusively to the entrepreneur agent (Baumol, 2007). The comprehension of those types of entrepreneurship may be useful to further developments on ethical, governance and business developments research agenda (Aeeni, Motavaseli, Sakhdari, & Dehkordi, 2019; Baumol, 2007, 2018).

Baumol's idea about what guides entrepreneurship could be conceptualised in the individual level as cognitions, which enables affectional states that may enhance individuals' motivation to generate their own business and its impacts. Based on this, Hmieleski and Lerner (2016) proposed a psychological comprehension to describe entrepreneurial motives in two motives typologies: productive entrepreneurial motives

and unproductive entrepreneurial motives. The analysis of those typologies allows assessing individuals' motives to become an entrepreneur and may be useful to describe a self or social-oriented entrepreneurial potential. Individuals with a predominance of productive entrepreneurial motives may be led by a communitarian and wellbeing concept of entrepreneurship (Harris, 2016; Santos, Neumeyer, & Morris, 2018; Zahra, Gedajlovic, Neubaum, & Shulman, 2009). Those motivated by unproductive entrepreneurial motives may foster business development in a self-capital accumulation conception by all costs, which may include unethical governance and human exploration (Anokhin & Schulze, 2009; Urbig, Weitzel, Rosenkranz, & Witteloostuijn, 2012).

In our study, we rely on that those descriptions are essential, because it may facilitate the assessment of individuals' entrepreneurial motives, which allow that future policy and actioners makers comprehend what drives individuals' potential to become entrepreneurship and improve entrepreneurial potential focusing positive motives (Santos, 2012; Stephan, 2018). We highlight the importance of those motives once entrepreneurial potential literature researchers usually want to improve individual's entrepreneurial intention, but never asks about what are the motives that drive individuals to become an entrepreneur and its outcomes for individuals and society (Fayolle, 2017; Parente, ElTarabishy, Vesci, & Botti, 2018).

Concentrating our efforts in entrepreneurs' mental health promotion and sustainable governance literature, we endorse that entrepreneurial potential is positive when it settled in personal and social development agenda (Desai, 2017; Miller, Grimes, McMullen, & Vogus, 2012). In that perspective, an entrepreneurial potential approach is only useful for future educational and social policy agenda if it is based on productive entrepreneurial motives that optimise individuals' opportunities by generating and spreading social value (Acs, 2006; Arrighetti, Caricati, Landini, & Monacelli, 2016; Schaefer & Minello, 2016).

Despite the centrality of that concept to the comprehension of the entrepreneur agent and its impact on organizations governance, we lack an instrument for measurement of entrepreneurial motives in Brazil, which is a country with reoccurrence of negative governance and social exploration in public and private institutions (Borges Junior, Andreassi, & Nassif, 2017; Filgueiras, 2009; Ribeiro, Alves, Martins, Lenzi, & Perc, 2018). Focused on that problem, we analysed full and short format internal structure to entrepreneurial motives scale in Brazil and checked its relation between scales formats and with personality using the Big Five taxonomy.

Method

Participants

We collected data from 660 Brazilian undergraduate students, majority female (60.50%) with 22,40 (SD = 5.23) years old. Most of them were at 3rd semester of course (SD = 1.77), studied at night period and 71.30% were partial job employed. We had obtained the data from different courses, as followed: Biomedicine (n = 126); Design and Architecture (n = 102); Management (n = 73); Pharmacy (n = 72); Civil Engineering (n = 71); Psychology (n= 58); Mechanical Engineering (n = 44); Chemical Engineering (n = 32); Software and Electrical Engineering (n = 31); Production Engineering (n = 31); Environment Engineering (n = 21).

Instruments

Entrepreneurial Motives Scale. A self-report instrument with ten items and two factors (Productive Motives; Unproductive Motives) in full format. It uses 5 points Likert response type scale. Prior internal structure evidence and internal consistency examination between test and retest showed robustness for the instrument (Hmieleski & Lerner, 2016).

Big Five Short Markers. A self-report instrument with 20 items and five factors (Openness; Conscientiousness; Extraversion; Agreeableness; Neuroticism) in full format. It uses 5 points Likert response type scale. It showed replication evidence for internal structure and internal consistency among different examinations in Brazil (Hauck, Machado, Teixeira, & Bandeira, 2012; Machado, Hauck, Teixeira, & Bandeira, 2014).

Procedures

The investigation protocol was approved and registered in the Brazilian Institutional Ethical Committee (CAAE: 91796218.5.0000.5514). For cultural adaptation process, we used target translation, experts content analysis and participants semantics analysis that demonstrated adequacy for the instrument in Brazilian context (Epstein, Santo, & Guillemin, 2015; Hambleton & Zenisky, 2010). After that, we applied with collective test administration the instrument among undergraduate students during the interval of university activities at the classroom. The full administration took from 15 to 20 minutes, and no relevant processual event or idiomatical issues were reported during applications.

Data Analysis

To analyse the internal instrument structure, first, we used R with package ‘psych’ to factor retention with parallel analysis (Hayton, Allen, & Scarpello, 2004). Then, we implemented firstly an exploratory factor analysis and secondly a factor analysis with a method factor Mplus (Maydeu-Olivares & Steenkamp, 2019). In both analyses, we used WLSMV estimator and polychoric correlation (Finney & DiStefano, 2013). Next, we used genetic algorithm to create a short version of the instrument, using R package ‘GAabbreviate’, that we also analysed the internal structure using exploratory factor analysis in Mplus with WLSMV estimator and polychoric correlation (Eisenbarth,

Lilienfeld, & Yarkoni, 2015; Özdemir, Toraman, & Kutlu, 2019; Sandy, Gosling, & Koelkebeck, 2014). We estimated internal consistency considering Ordinal Cronbach's Alpha and McDonald's Omega using R package 'userfriendlyscience' with a confidence interval for a bootstrapping of 1000 cases (Peters, 2014). Next, we used Mplus to generate factor scores of instruments, that we examined to check its relation between instrument structures and with Big Five. For that exam, we used Pearson's Correlation in R 3.6.0.

Results

Parallel analysis using polychoric correlation indicated factorial retention with two factors (empirical eigenvalue = 1.19; simulated eigenvalue = 1.14). Then, the first exploratory factor analysis also retrieved two factors with factor loading from .587 to .930 for the scale in full format with ten items. The second structure with ten items, but using factor analysis with a method factor, also recovered two descriptive factors with factor loading from .361 to .785, while we generated one method factor with all items and non-correlated with descriptive factors.

The third structure had items selected by a prior genetic algorithm implementation that fitted in an iteration of 150 generations with a cross-validation to the scale full format. The scale short format achieved 95,30% convergence with the scale full format in the training procedure and 95,73% in the cross-validation procedure with an item cost of .204 for the algorithm (Appendix 1A). In the exploratory factor analysis, the scale short format obtained two factors and factor loading that varied from .573 to .952. The internal consistency was satisfactory for the majority of factors, except for the factor method in the factor analysis with a method factor of the second structure, as shown in Table 1A.

Table 1A.
Factor loading and internal consistency for entrepreneurial motives

	F-EFA		F-M-EFA			S-EFA	
	EM-P	EM-U	EM-P	EM-U	M	EM-P	EM-U
Item 01	.000	.796	.000	.785	-.137	-.095	.650
Item 02	-.043	.908	.000	.897	-.204	-	-
Item 03	-.007	.831	.000	.819	-.149	-	-
Item 04	.116	.836	.000	.818	-.020	.001	.952
Item 05	.242	.587	.000	.566	.157	.146	.573
Item 06	.821	.109	.145	.000	.861	.770	.104
Item 07	.930	.018	-.050	.000	.930	-	-
Item 08	.871	.090	.361	.000	.818	.910	-.050
Item 09	.777	.004	.413	.000	.668	.738	.003
Item 10	.806	.088	.679	.000	.649	-	-
	$\alpha = .914$	$\alpha = .878$	$\alpha = .881$	$\alpha = .878$	$\alpha = .727$	$\alpha = .836$	$\alpha = .752$
Internal Consistency	[.904 – .925]	[.864 – .893]	[.865 – .896]	[.864 – .893]	[.693 – .761]	[.815 – .858]	[.719 – .785]
[CI 95%]	$\omega = .915$	$\omega = .884$	$\omega = .882$	$\omega = .884$	$\omega = .452$	$\omega = .839$	$\omega = .777$
	[.905 – .925]	[.870 – .898]	[.867 – .897]	[.870 – .898]	[.401 – .503]	[.818 – .860]	[.749 – .804]

Note. **Bold** = Indicates item adequacy to the factor; EM = Entrepreneurial motives P = Productive; U = Unproductive; F = Full format; EFA = Exploratory factor analysis; M = Method factor; S = Short format; CI = Confidence interval.

In the case of the second structure, the factor analysis with a method factor, the method factor and productive entrepreneurial motives (EM-P) factor loading seems exchanged between the items 05 to 10, once the method factor got higher factor loading in all the items when compared to the descriptive factor of productive entrepreneurial motives. For the first (F-EFA) and second structure (S-EFA), there was a fit between factors and theoretical dimensions when examining factor loading for all the items. Regardless of the factor loading confounding between descriptive and the method factor in the second structure, the fit indexes appear adequate for that structure. We also identified robust fit indexes for the first and third model, as proposed in Table 2A.

Table 2A.
Internal structure model indexes of entrepreneurial motives scale

EM	Length	Factors	χ^2/df	CFI	GFI	RMSEA
F-EFA	10 items	2	7.639	.972	.952	.090
F-RI-EFA	8 items	2	3.263	.991	.984	.058
S-EFA	6 items	2	2.349	.997	.987	.045

Note. EM = Entrepreneurial motives; F = Full format; EFA = Exploratory factor analysis; M = Method factor; S = Short format.

When examined the correlations between scores for the three models, it possible to identify a low convergence between the second model of factor analysis with a method factor and the first exploratory factor analysis ($r = .378$; $p < .01$) for productive entrepreneurial motives (EM-P). It also happened when analysing correlations between scores to productive entrepreneurial motives (EM-P) of the second model of factor

analysis with a method factor and the third model that relied on a short format designed by genetic algorithm and exploratory factor analysis ($r = .312$; $p < .01$). On the other hand, there was a strong correlation between first (F-EFA) and third model (S-EFA) for productive entrepreneurial motives ($r = .952$; $p < .01$). In the case of unproductive entrepreneurial motives, the correlations between scores in the different formats were strong and satisfactory between all scale formats. The highest were the correlation between the first exploratory factor analysis and the second model of factor analysis with a method factor ($r = .987$; $p < .01$) and the lowest were between the third model of short format and the first model of exploratory factor analysis ($r = .890$; $p < .01$) as shown in Table 3A.

Table 3A.

Correlations between scores of productive and unproductive entrepreneurial motives scales formats

	EM-P			EM-U		
	F-EFA	F-M-EFA	S-EFA	F-EFA	F-M-EFA	S-EFA
F-EFA	1			1		
F-M-EFA	.378**	1		.987**	1	
S-EFA	.952**	.312**	1	.890**	.901**	1

Note. * = $p < .05$; ** = $p < .01$; EM = Entrepreneurial motives P = Productive; U = Unproductive; F = Full format; EFA = Exploratory factor analysis; M = Method factor; S = Short format.

In the case of criterion validity with Big Five taxonomy of personality, the three models showed positive correlations between productive entrepreneurial motives (EM-P) and agreeableness (A) and conscientiousness (C). The highest correlation for productive entrepreneurial motives and Big Five occurred for the first model ($r_A = .237$; $p < .01$; $r_C = .222$; $p < .01$) and the lowest was the second model of factor analysis with a method factor ($r_A = .116$; $p < .01$; $r_C = .143$; $p < .01$).

When considering the correlation with criterion for unproductive entrepreneurial motives, we evidenced conscientiousness (C), neuroticism (N) and extraversion (E) importance. The first exploratory factor analysis ($r_C = -.080$; $p < .05$; $r_N = .098$; $p < .05$) and the second model of factor analysis with a method factor ($r_C = .048$; $p > .05$; $r_N = .095$;

$p < .01$) shown negative correlation with conscientiousness and neuroticism. The negative effect of conscientiousness and positive effect of neuroticism also happened with the third short model, designed by short algorithm, but no statistical significance was evidenced ($r_C = -.042$; $p > .05$; $r_N = .048$; $p > .05$). Specially in the case of that third model there was a positive correlation of extraversion ($r_E = .077$; $p < .05$); as disposed in Table 4A.

Table 4A.

Correlations between personality, productive and unproductive entrepreneurial motives

Big Five	F-EFA		F-M-EFA		S-EFA	
	EM-P	EM-U	EM-P	EM-U	EM-P	EM-U
Openness	.074	.018	.030	.032	.068	.026
Agreeableness	.237**	-.039	.116**	.002	.213**	.025
Extraversion	.021	.043	.064	.048	.005	.077*
Conscientiousness	.222**	-.080*	.143**	-.044	.188**	-.042
Neuroticism	-.016	.098*	-.070	.095*	-.001	.048

Note. * = $p < .05$; ** = $p < .01$; EM = Entrepreneurial motives P = Productive; U = Unproductive; F = Full format; EFA = Exploratory factor analysis; M = Method factor; S = Short format.

Discussion

The present study aimed to analyse the full and short format internal structure to entrepreneurial motives scale in Brazil, and check its relation between scales formats and with personality using the Big Five taxonomy. The models replicated with satisfactory indexes the internal structure and consistency with robust fit indexes. It also generated new evidence about entrepreneurial motives and its relationships that may contribute to further developments about personality and entrepreneurial potential focusing on entrepreneurial motives (Lundmark & Westelius, 2019; Şahin, Karadağ, & Tuncer, 2019).

The internal structure seems adequate for the first exploratory factor analysis model and robust for the short format generated by genetic algorithm, but a bit unclear when considering the interpretation of items for the second model of factor analysis with a method factor. In that case, we understand that the relation for the productive entrepreneurial motives in the second structure cannot be interpreted as a descriptive

factor (Biderman, McAbee, Job Chen, & Hendy, 2018). It seems exchanged with the method factor for the productive entrepreneurial motives. In some cases, this confusion may figure out as a limitation for this type of modelling to control method bias suggesting the implementation of other techniques (Aichholzer, 2014; Podsakoff, MacKenzie, & Podsakoff, 2012).

That evidence also needs to be considered when examining that structure and its relationship with other structures and personality, once the method factor does not characterise the productive entrepreneurial motives factor. In order to optimise it, further models could consider, instead of a method factor, a response style control, like acquiescence and social desirability, because, as happened in our study, in some structures a method factor may not be optimal and mislead the internal structure (Danner, Aichholzer, & Rammstedt, 2015; King & Bruner, 2000; Paunonen & LeBel, 2012; Zanon, Lessa, & Dellazzana-Zanon, 2018).

Still considering the internal structure, it evidences convergence between the first exploratory factor analysis model and robust for the short format generated by genetic algorithm, besides the second model of factor analysis with a method factor lacked on evidence for productive entrepreneurial motives factor. Criterion validity with personality seems satisfactory for all the models when considering productive entrepreneurial motives and previous evidence between personality and entrepreneurship (Hmieleski & Lerner, 2016; Leutner, Ahmetoglu, Akhtar, & Chamorro-Premuzic, 2014). However, a more in-depth approach between personality and unproductive entrepreneurial motives should be developed, once it followed patterns demonstrated in the literature, but its magnitude consistency is not substantial when considering the variation between the different internal structures.

When considering its application in Brazilian reality, we highlight the full format, tested in first exploratory factor analysis model instead of the second model factor

analysis with a method factor, as a better approach to develop new evidence about students' entrepreneurial motives in entrepreneurial education programs and university start-ups (Desai, 2017). For the test and more profound comprehension of entrepreneurial policies and practices at university, we also indicate the use of the short format generated by genetic algorithm, once it seems more parsimonious and showed a lower length that may be useful for extensive assessment educational contexts (Schaefer & Minello, 2016).

As a study limitation, we emphasise our restricted sample among different courses that can be expanded and developed between other courses and contexts in order to test its stability and replication (Honig & Samuelsson, 2015). It is also essential to check the replication of those evidence with graduated students, once we had a predominance of midterm course and freshman. Beyond that, a test of those scales' structures and evidence in students of other nationality would also contribute for better comprehension and application in further investigation and practices that foster positive entrepreneurial potential with university students focusing individuals' entrepreneurial motives (Parente et al., 2018).

We end up with a comprehension that the effectiveness of entrepreneurial potential initiatives can be boosted up, in a positive governance agenda and mental health perspective to overcome recent social issues if we develop a further comprehension of entrepreneur agent and its impact on organisations governance. Inevitably, it is only possible when we understand why do people become entrepreneur, by comprehending under a clear approach entrepreneurs' motivation and, precisely, their entrepreneurial motives.

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Study B – Paper 2: Cultural adaptation and internal structure for entrepreneurial intention and its relation with Big Five

Abstract

We explored internal structure and criterion validity for an instrument of entrepreneurial intention scale in a sample of 660 Brazilian undergraduate students in order to optimise the assessment of that attribute in that population. We tested three internal structure using exploratory factor analysis, factor analysis with a method factor and a brief structure developed with genetic algorithm. The brief version generated with genetic algorithm showed the best internal structure and criterion validity when correlated with the other internal structure and Big Five. It implies in favourable evidence to that instrument to assess the entrepreneurial intention among Brazilian undergraduate students and offer an optimal and shorter structure to entrepreneurial intention scale that can be tested across different countries to check its stability.

Keywords: intention, personality, bias, entrepreneurship, psychometrics

Resumo

Explorou-se a estrutura interna e a validade de critério para um instrumento de escala de intenção empreendedora em uma amostra de 660 estudantes universitários brasileiros, a fim de otimizar a avaliação desse atributo nessa população. Testaram-se três estruturas internas usando análise fatorial exploratória, análise fatorial com um fator de método e uma estrutura reduzida desenvolvida com algoritmo genético. A versão reduzida gerada com algoritmo genético apresentou estrutura interna e validade de critério com índices otimizados quando correlacionada com as demais estruturas internas e Big Five. Isso implica em evidências favoráveis a essa estrutura para avaliar a intenção empreendedora entre os estudantes brasileiros de graduação ao oferecer uma estrutura abreviada para a escala de intenção empreendedora que deve ser testada em diferentes países para verificar sua estabilidade.

Palavras-chave: intenção, personalidade, viés, empreendedorismo, psicometria

Resumen

Exploramos la estructura interna y la validez de criterio para un instrumento de escala de intención empresarial en una muestra de 660 estudiantes universitarios brasileños para optimizar la evaluación de ese atributo en esa población. Probamos tres estructuras internas usando análisis factorial exploratorio, análisis factorial con un factor de método evaluativo y una estructura breve desarrollada con algoritmo genético. La versión breve generada con algoritmo genético mostró la mejor estructura interna y validez de criterio cuando se correlacionó con la estructura interna de otros y Big Five. Implica en evidencia favorable a ese instrumento para evaluar la intención empresarial entre estudiantes universitarios brasileños y ofrecer una estructura óptima y más corta a la escala de intención empresarial que se puede probar en diferentes países para verificar su estabilidad.

Palabras clave: intención, personalidad, sesgo, emprendedurismo, psicometría

There are many approaches to understand the number of nascent enterprises. The socioeconomic approach focuses on contextual and political influences that may foster or block new business development (Cuevas, 1994; Ferreira, Fernandes, & Kraus, 2019; Smith & Chimucheka, 2014). Besides of that contribution, there are criticisms about the socioeconomic approach that does not consider individuals cognitions and behaviours as a predictor of future business development (Fisher, 2012; Palmer, Niemand, Stöckmann, Kraus, & Kailer, 2019; Pittaway, 2005). In a complementary perspective, become an entrepreneur is a rational planned behaviour that can be understood to boost the number of nascent enterprises and economic development (Engle et al., 2010; Kautonen, van Gelderen, & Fink, 2015).

While socioeconomic seems an established and developed background, when focusing the entrepreneurship literature, the psychological aspects seem underdevelopment about its basis and impacts from 1980th to now (Esfandiar, Sharifi-Tehrani, Pratt, & Altinay, 2019; Krueger & Carsrud, 1993). In that framework, the psychological study of the entrepreneurship focusses on the individual perspective about the cognitive and affective process that guides individuals to become an entrepreneur (Krueger, Reilly, & Carsrud, 2000; Schlaegel & Koenig, 2014). In order to contribute in that development, the test of theories by evidence-based seems essential, once it may indicate robust proposes that can guide further studies in that field (Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017).

Focusing on the rational planned behaviour perspective, Liñán and Chen (2009) had established a cross-cultural propose of measurement that seems replicated (Rueda, Moriano, & Liñán, 2015). Under the concept of entrepreneurial planned behaviour, attitudes, cognitions and subjective norms interact to generate entrepreneurial intention that is pre-action characteristic, once it proceeds individuals' efforts and behaviours to create own business (Frese & Gielnik, 2014; Wach & Wojciechowski, 2016). In a

psychological approach to understanding the entrepreneurial process that instrument can be useful to assess pre-action characteristics of potential entrepreneurs in order to improve optimise the comprehension of individuals thoughts about creating own business (Tornikoski & Maalaoui, 2019).

In Brazil, the Brazilian National Strategy of Science and Innovation highlights the comprehension of behavioural and psychological aspects of entrepreneurship (Turchi & Morais, 2017). The central public of that policy is the undergraduate students, once it may contribute to developing in a new generation of academics and scientists' ideas that could be transformed into value by using entrepreneurship (Etzkowitz & Zhou, 2017; Leite & Dias, 2015; Moura-Filho, Rocha, Teles, & Torres, 2019).

However, when we consider Brazilian context, we found a misconceptualization and minimal development to assessment entrepreneurs' psychological aspects and generate its indicators to future evidence-based practices (Arbix, Salerno, Amaral, & Lins, 2017; Borges Junior, Andreassi, & Nassif, 2017). It implies low accuracy to generate practical evidence for public policymaking and practical implementation about that theme (Araujo, 2018; Coutinho, Foss, Mouallem, & Bucci, 2017; Turchi & Morais, 2017).

Focusing on those issues, we proposed the cultural adaptation of entrepreneurial intention scale and analysed its internal structure and criterion validity in Brazil among undergraduate students in order to optimise the assessment of entrepreneurial intention among this population.

Method

Participants

We sampled 660 Brazilian undergraduate students. Most of them were at 3rd semester of course ($SD = 1,77$), studied at night period and 71,3% were partial job employed. The majority were female (60,5%) with 22,40 ($SD = 5,23$) years old. We data

collected between different courses: Biomedicine (n = 126); Design and Architecture (n = 102); Management (n = 73); Pharmacy (n = 72); Civil Engineering (n = 71); Psychology (n = 58); Mechanical Engineering (n = 44); Chemical Engineering (n = 32); Software and Electrical Engineering (n = 31); Production Engineering (n = 31); Environment Engineering (n = 21).

Instruments

Entrepreneurial Intention Scale. Self-report and unifactorial scale (Entrepreneurial Intention) with six items on its full format. It uses 5 points Likert response type scale. Studies showed its psychometrical adequacy in cross-cultural assessment proposals (Liñán & Chen, 2009; Rueda et al., 2015).

Big Five Short Markers. Self-report scale with five factors (Openness; Conscientiousness; Extraversion; Agreeableness; Neuroticism) and 20 items in full format. It uses 5 points Likert response type scale. It showed replication evidence for internal structure and internal consistency among different examinations in Brazil (Hauck, Machado, Teixeira, & Bandeira, 2012; Machado, Hauck, Teixeira, & Bandeira, 2014).

Procedures

The current project was registered in the Brazilian Institutional Ethical Committee (CAAE: 91796218.5.0000.5514). In the cultural adaptation process, we used target translation, experts content analysis and participants semantics analysis that demonstrated content and semantic equivalence for the instrument in Brazil when compared to the original version (Epstein, Santo, & Guillemin, 2015; Hambleton & Zenisky, 2010). Finally, we administrated the instrument among undergraduate students at classroom during activities interval. No relevant processual event or idiomatical issues were reported

during applications. The whole application took from 15 to 20 minutes in each administration.

Data Analysis

We analysed the instrument internal structure using the R package ‘psych’ to factor retention with parallel analysis (Hayton, Allen, & Scarpello, 2004). Next, we used exploratory factor analysis and factor analysis with a method factor in software Mplus (Maydeu-Olivares & Steenkamp, 2019; Podsakoff, MacKenzie, & Podsakoff, 2012). Then, the genetic algorithm was applied to create a short version of the instrument, using the R package ‘GAabbreviate’ (Eisenbarth, Lilienfeld, & Yarkoni, 2015; Sandy, Gosling, & Koelkebeck, 2014). Subsequent, we used the short version generated by that package in Mplus to test its internal structure with exploratory factor analysis.

Finally, we estimated internal consistency considering Ordinal Cronbach’s Alpha and McDonald’s Omega with the R package ‘userfriendlyscience’ (Peters, 2014). We also generated a confidence interval for a bootstrapping of 1000 cases to those internal consistency indicators. For the examination of criterion validity, we used at first the software Mplus to generate factor scores of instruments, and then checked its relation between instrument structures and with Big Five using Pearson’s Correlation in R Base 3.6.0. In all the factor analysis and modelling of our study, we used WLSMV estimator and polychoric correlation as it has shown a better fit for estimation of models with categorical indicators and latent variables (Finney & DiStefano, 2013; Özdemir, Toraman, & Kutlu, 2019)

Results

The parallel analysis indicated one factor when using polychoric correlation (empirical eigenvalue = 1.14; simulated eigenvalue = 1.13). For the first exploratory factor analysis model, we retrieved a six items structure with factor loading from .805 to

.973. In the second model, using factor analysis with a method factor, we created a method factor not correlated with entrepreneurial intention in order to improve the measure model adjustment. At this second structure, entrepreneurial intention factor loading went from .717 to .971 for the six items. The factor analysis with a method factor also got some factor loading from items that varied from .010 to .407.

To analyse the third structure, primary, we applied a genetic algorithm to select the best items to compose the short instrument form using a cross-validation criterion with the instrument in full format. It took 100 iterations to achieve 99,29% convergence in the training station and 99,22% in the cross-validation attempt. The final item cost estimated was .054 for the algorithm with a four items version (Appendix 1B). The exploratory factor analysis of the scale in short format got factor loading from .757 to .985. For all the structures, internal consistency indexes were robust as exhibited in Table 1B.

Table 1B.
Factor loading and internal consistency for the entrepreneurial intention

	F-EFA	F-M-EFA		S-EFA
	EI	EI	M	EI
Item 01	.805	.717	.388	.757
Item 02	.926	.866	.396	.905
Item 03	.927	.867	.407	-
Item 04	.973	.939	.206	.985
Item 05	.936	.938	.145	-
Item 06	.923	.971	.010	.926
Internal	$\alpha = .966$	$\alpha = .966$	$\alpha = .960$	$\alpha = .940$
Consistency	[.962 – .970]	[.962 – .970]	[.955 – .965]	[.933 – .948]
[CI 95%]	$\omega = .967$	$\omega = .967$	$\omega = .961$	$\omega = .941$
	[.963 – .971]	[.963 – .971]	[.956 – .966]	[.934 – .949]

Note. EI = Entrepreneurial intention; F = Full format; EFA = Exploratory factor analysis; M = Method factor; S = Short format; CI = Confidence interval.

The model fit for all the structures went optimal when looking for CFI and GFI indexes. Nonetheless, it showed elevated RMSEA and χ^2/gl , when considering the first exploratory factor analysis model. The use of factor analysis with a method factor made RMSEA and χ^2/gl lower, but the optimal solution came with the implementation of a genetic algorithm. The short-scale exploratory factor analysis, generated by the genetic algorithm, shown substantial lower residuals when compared with the two others structures as seen in Table 2B.

Table 2B.
Internal structure model indexes of entrepreneurial intention

EM	Length	Factors	χ^2/gl	CFI	GFI	RMSEA
F-EFA	6 items	1	18.828	.998	.995	.162
F-M-EFA	6 items	1	4.511	.999	.998	.072
S-EFA	4 items	1	0.033	.999	.999	.056

Note. EI = Entrepreneurial intention; F = Full format; EFA = Exploratory factor analysis; M = Method factor; S = Short format.

Correlations between scales formats were positive and significant. The lowest correlation was between the scores of the first exploratory factor analysis of the scale in full format and the third exploratory factor analysis of the scale in the short format ($r = .666$; $p < .01$). The highest correlation happened between the second-factor analysis with a method factor and the third exploratory factor analysis of the scale in the short format ($r = .977$; $p < .01$). We show correlations between entrepreneurial intention scales formats in Table 3B.

Table 3B.
Correlations between scores of entrepreneurial intention scales formats

	EI		
	F-EFA	F-M-EFA	S-EFA
F-EFA	1		
F-M-EFA	.670**	1	
S-EFA	.666**	.977**	1

Note. * = $p < .05$; ** = $p < .01$; EI = Entrepreneurial intention; F = Full format; EFA = Exploratory factor analysis; M = Method factor; S = Short format.

Criterion validity of entrepreneurial intention and Big Five demonstrated a positive correlation with openness (O), agreeableness (A), extraversion (E), conscientiousness (C) and negative correlation with neuroticism (N) for all the structures and scale formats. The third short format structure generated with genetic algorithm shown the highest correlation for openness ($r = .247$; $p < .01$), agreeableness ($r = .119$; $p < .01$) and conscientiousness ($r = .113$; $p < .01$), and the lowest for neuroticism ($r = -.156$; $p < .01$). For extraversion, the highest correlation occurred with the first exploratory factor analysis with the scale in full format ($r = .144$; $p < .01$). All the other correlations are disposed of in Table 4B.

Table 4B.
Correlations between personality and entrepreneurial intention

	F-EFA	F-M-EFA	S-EFA
Big Five	EI	EI	EI
Openness	.217**	.236**	.247**
Agreeableness	.114**	.106**	.119**
Extraversion	.144**	.135**	.133**
Conscientiousness	.111**	.111**	.113**
Neuroticism	-.107**	-.142**	-.156**

Note. * = $p < .05$; ** = $p < .01$; EI = Entrepreneurial intention; F = Full format; EFA = Exploratory factor analysis; M = Method factor; S = Short format.

Discussion

In the present study, we aimed to proceed with the cultural adaptation of entrepreneurial intention scale and analyse its internal structure and criterion validity with Big Five in Brazil among undergraduate students. The cultural adaptation process worked adequately with no idiomatical issues during its administration (Hambleton & Zenisky, 2010). The internal structure also is shown reasonable for the scale in the full and short format, while the criterion validity with Big Five worked as prior literature examinations (Brandstätter, 2011; Leutner, Ahmetoglu, Akhtar, & Chamorro-Premuzic, 2014). In the case of the internal structure analysis, it is essential to highlight the high residual evidence from RMSEA and χ^2/df of the first exploratory factor analysis of the scale on its full format.

When based in psychometric literature, it is possible to explain those residuals due to the existence of another factor for the scale or high collinearity between its items (Asparouhov & Muthén, 2009; Reddy, 1992). We do not hypothesis another descriptive factor of entrepreneurial intention, once other studies replicated that unifactorial structure also suggesting one factor for entrepreneurial intention as we found in our investigation (Cortez & Veiga, 2019; Rueda et al., 2015).

The use factor analysis with a method factor not correlated with entrepreneurial intention in the second structure solved that issue partially. It allows us to hypothesis the existence of response bias or another method factor not correlated with entrepreneurial

intention as a possible explanation of that residual variance (Podsakoff et al., 2012). Some criticism may exist in that case, about the use of a method factor in a single factor structure, indicating that it may imply in a model with overcontrol, and diminish the proper assessment of the attribute. However, we opted to report those psychometric properties as an illustration that it impacts on lowering the factorial loading, which must be considered by practitioners.

Other relevant evidence comes from the third model for the short scale using a genetic algorithm, that made the residual lower and optimised the model adjustment by algorithmic guided item selection (Sandy et al., 2014). In that case, the algorithm may have selected the most representative items and deleted those that were too much similar, once total cost and explained variance kept almost the same between generations in the iteration algorithm process. As a result of that dynamic, the genetic algorithm lowered instrument collinearity making the brief structure more parsimonious and focused on the proper assessment of entrepreneurial intention when compared to other versions of that instrument (Cortez & Veiga, 2019; Liñán & Chen, 2009).

The parsimony and objectivity of the third short scale structure, created by the genetic algorithm, is also evidenced when we check correlations between the different scale formats scores. The third short scale structure had a better fit with scores of the second structure, that controlled method bias with the application of factor analysis with a method factor, than with the scale score of first exploratory factor analysis. The third structure optimal fit also was evidenced by its correlation with the Big Five criterion. Four out five Big Five factors (O, A, C, N) showed optimal criterion correlation for the third structure when considering prior literature appointment about entrepreneurial intention and personality (Liang, Chia, & Liang, 2015; Murugesan & Jayavelu, 2017; Şahin, Karadağ, & Tuncer, 2019).

We suggest that it may indicate that the use of genetic algorithm could also be useful for further exploration of scale format selection when practitioners are interested in reducing response and method bias interference on scores of self-report instruments (Maydeu-Olivares & Steenkamp, 2019). Future simulation studies with that focus could improve the comprehension about that topic (Montag & Elhai, 2019). Bearing in mind the limitation of our study, we point out to the restricted sample among different courses that can be expanded and developed between other courses. We also endorse the replication of those evidence with graduated students, once we had a predominance of midterm course and freshman. Others examinations of our internal structures proposal and its correlation would also be useful if applied in other nationalities to check its stability.

Based on our study, we indicate the use of the third short format structure for further examination of entrepreneurial intention among Brazilian undergraduate students. Our main contribution, from a practical perspective, focus the possibility of assessing the entrepreneurial intention among potential Brazilian entrepreneurs which improves analytical comprehension about that theme under that population. In the entrepreneurial potential research field, we contribute with evidence that a shorter structure of entrepreneurial intention scale can possible optimize its comprehension as a more accurate and parsimonious assessment proposal.

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Study C – Paper 3: Prediction of entrepreneurial motives and entrepreneurial intention and its relation with psychopathy

Abstract

We tested the relations between entrepreneurial motives and intention, considering psychopathy as a predictor. Two predictive models were proposed, and both evidenced primary psychopathy as a positive predictor of unproductive entrepreneurial motives and entrepreneurial intention, while it addresses negative effect on productive entrepreneurial motives. It also has shown secondary psychopathy was a positive predictor of unproductive entrepreneurial, but it had negative effect predictor on entrepreneurial intention and productive entrepreneurial motives. Entrepreneurial motives got positive effect on entrepreneurial intention, although unproductive entrepreneurial motives had higher effect on entrepreneurial intention than productive entrepreneurial motives. The effects were optimised in the second model with two evaluative factors to control acquiescence and social desirability response styles. Findings suggest the centrality of entrepreneurial motives and its relationship on the development of entrepreneurial potential and education agenda that foster ethical governance and the positive effect of controlling response style bias when assessing negative personal characteristics by self-report instruments.

Keywords: intention, motives, psychopathy, entrepreneurship, psychometrics

Resumo

Testaram-se as relações entre motivos e intenção empreendedora, considerando a psicopatia como preditora. Dois modelos preditivos foram propostos e ambos evidenciaram a psicopatia primária como preditora positiva de motivos improdutivos para empreender e intenção empreendedora, enquanto apresenta efeito negativo sobre os motivos produtivos para empreender. Demonstrou-se que a psicopatia secundária era um preditor positivo de motivos improdutivos para empreender, mas teve efeito negativo sobre a intenção empreendedora e os motivos produtivos para empreender. Finalmente, ambos motivos para empreender obtiveram efeito positivo na intenção empreendedora, embora os motivos improdutivos para empreender tivessem maior grau de impacto sobre a intenção empreendedora do que os motivos produtivos para empreender. Os efeitos foram otimizados no segundo modelo, com dois fatores avaliativos para controlar os estilos de resposta de aquiescência e desejabilidade social. Os resultados sugerem a centralidade dos motivos para empreender e suas relações no desenvolvimento de uma agenda de educação e potencial empreendedor que fomente a governança ética. Também elucida o efeito positivo de controlar o viés de estilo de resposta ao avaliar características pessoais negativas por instrumentos de autorrelato.

Palavras-chave: intenção, motivos, psicopatia, empreendedorismo, psicometria

Resumen

Pusimos a prueba las relaciones entre los motivos empresariales y la intención considerando la psicopatía como un predictor. Se propusieron dos modelos predictivos y ambos evidenciaron una psicopatía primaria como predictor positivo de motivos empresariales improdutivos e intención empresarial, mientras que aborda el efecto negativo en los motivos empresariales productivos. También mostró que la psicopatía secundaria era un predictor positivo de emprendimiento improductivo, pero tenía un predictor de efecto negativo sobre la intención emprendedora y los motivos emprendedores productivos. Finalmente, los motivos empresariales tuvieron un efecto positivo en la intención empresarial, aunque los motivos empresariales improdutivos tuvieron un mayor efecto sobre la intención empresarial que los motivos empresariales productivos. Los efectos se optimizaron en el segundo modelo con dos factores evaluativos para controlar los estilos de respuesta de aquiescencia y deseabilidad social. Los hallazgos sugieren la centralidad de los motivos emprendedores y su relación en el desarrollo de una agenda de educación y potencial emprendedor que fomente la gobernanza ética y el efecto positivo de controlar el sesgo del estilo de respuesta al evaluar las características personales negativas mediante instrumentos de autoinforme.

Palabras clave: intención, motivos, psicopatía, emprendimiento, psicometría

Why do not become an entrepreneur? That question probably had been proposed as a career and occupational solution for most graduate students (Davey, Plewa, & Struwig, 2011; Marshall & Gigliotti, 2018; Wilson, Kickul, & Marlino, 2007). Considering the entrepreneurial potential approach (Krueger & Brazeal, 1994; J. L. Thompson, 2004) become an entrepreneur is more feasible if we boost individuals' characteristics relevant to generate new businesses (Sánchez, 2013; Schlaegel & Koenig, 2014; J. Thompson, Alvy, & Lees, 2000). It may happen in different contexts, including universities as part of personal and technical skills development focusing on competencies for future venture creation (Mwasalwiba, 2010; Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017; Oosterbeek, van Praag, & Ijsselstein, 2010; Pittaway & Cope, 2007).

Despite this comprehension, boosting entrepreneurial characteristics is not that simple. It could be easier if entrepreneurship were an unequivocal fit formula for business development under global approaches, which does not seem to be the case (Devece, Peris-Ortiz, & Rueda-Armengot, 2016; Sarasvathy, 2004). Some studies about the theme showed it might not be an easy task to develop potential entrepreneurs if we keep on looking for a straight forward global approach (Temitope Ogbara, 2018; Williams Middleton & Donnellon, 2014). There is some evidence that entrepreneurial potential approach can generate positive impacts, which in most of the cases occurs at a local level (Ferreira, Loiola, & Gondim, 2017; Santos, Neumeyer, & Morris, 2018; Sutter, Bruton, & Chen, 2019). In that framework, it is simple to realise that entrepreneurship is a multidetermined process with several contingencies that may impact its outcomes (Johannisson, 2016; Lans, Tynjälä, Biemans, Ratinho, & Karimi, 2017).

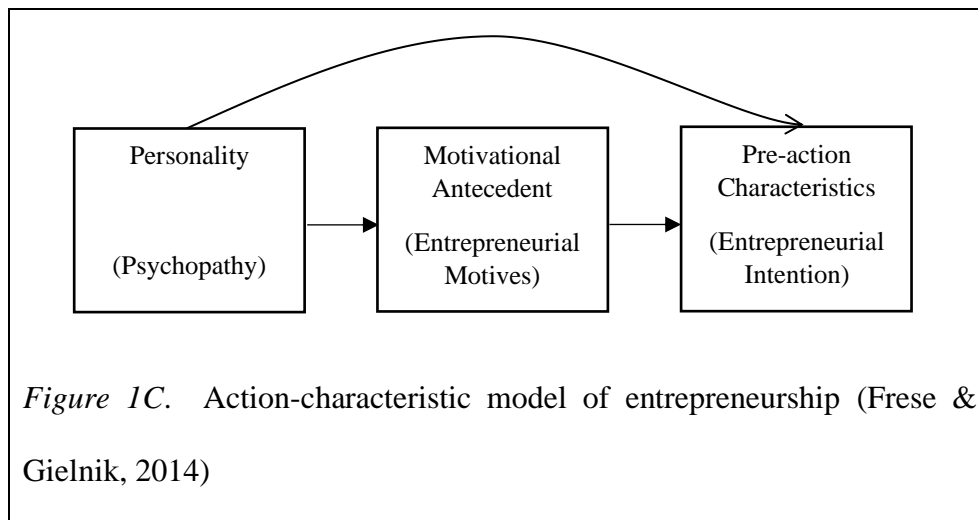
Due that multideterminant, it is important to consider psychological aspects in that process in local contexts, once those attributes interact with contextual stimulus to

generate entrepreneurship outcomes (Jayawarna, Rouse, & Kitching, 2013; Shane & Venkataraman, 2007; Shaver & Scott, 1992; Shirokova, Osiyevskyy, & Bogatyreva, 2016). Currently, the model proposed by Frese (2009) seems optimal to comprehension about its interactive process, when considering psychological attributes. In the psychological perspective, it concentrates on personality, cognitions, motivational and affective antecedents that impacts on action characteristics resulting in a future business generation (Bird, 2015; Frese & Gielnik, 2014; Veiga, Demo, & Neiva, 2017). Given that model and focusing on a deep comprehension of potential entrepreneur characteristics, we decided to do a further examination in personality, intention and motives of Brazilian undergraduate potential entrepreneurs.

We focused in undergraduate students once, in Brazil, there is a concentration of public policy and entrepreneurial education at universities (Campelli, Casarotto-Filho, Barbejat, & Moritz, 2011; Cortez & Veiga, 2018). We also verified that different studies had already emphasised the relation between attitudes, cognitions, intention and behaviour on entrepreneurial potential under undergraduate students (Bae, Qian, Miao, & Fiet, 2014; Esfandiar, Sharifi-Tehrani, Pratt, & Altinay, 2019; Krueger, 2017; Wang, Lin, Yeh, Li, & Li, 2016). However, it stills obscure why someone would personally become an entrepreneur, and what motives entrepreneurial intention among potential entrepreneurs?

Specifically, it seems important to qualify the type of potential entrepreneurship we are boosting through entrepreneurial education to impact in the development of an ethical, health and well-being centred approach (Brieger, Terjesen, Hechavarría, & Welzel, 2018; Santos, 2012). If we want to overcome most of the social and environmental issues of our present context it is vital to outgrow the simple idea of promoting potential entrepreneurship as new venture creation and include on its priorities productive social motives, which are related to humanized ethics and sustainable social

practices (Fassin, 2005; Markman, Russo, Lumpkin, Jennings, & Mair, 2016; Zahra, Gedajlovic, Neubaum, & Shulman, 2009). In order to contribute to that proposal, based in Frese (2009) model, we selected optimal measurement instruments to represent its attributes and obtain insights about personality, entrepreneurial motives and entrepreneurial intention.



As disposed of in Figure 1C, we represented intention as pre-action characteristics, following the rational planned behaviour perspective, once Liñán and Chen (2009) had established a measurement that seems highly replicated (Botsaris & Vamvaka, 2016; Malebana, 2014; Rueda, Moriano, & Liñán, 2015). For an analysis of motivational antecedents, we used Hmieleski and Lerner (2016) comprehension of entrepreneurial motives, that focus on Baumol (1996) typologies of productive (generate social value) and unproductive (explores social value) entrepreneurial motives. For personality conception, we used Levenson, Kiehl and Fitzpatrick (1995) psychopathy model – that fits with a non-psychopathological comprehension of the phenomenon – adequate to assessing primary psychopathy and secondary psychopathy in undergraduate students.

We looked for evidence about potential entrepreneurs' motivators and intention and its relation with psychopathy, once it seems important to find out if future

entrepreneur personal characteristics seem more correlated with positive or negative individual aspects. The comprehension of those relationships may allow future entrepreneurship outcome in order to previously develop a research, practical and educational agenda to promote entrepreneurial potential socially productive (Brieger et al., 2018). Based on that perspective, we tested the relations between entrepreneurial motives and intention considering personality traits of psychopathy as a predictor.

Method

Participants

We applied the instruments in a sample of 660 Brazilian undergraduate students, majority female (60.5%) with 22.40 (SD = 5.23) years old. Most of them were at 3rd semester of course (SD = 1.77) and 71,3% studied at night period. We had obtained the data from different courses, as followed: Biomedicine (n = 126); Design and Architecture (n = 102); Management (n = 73); Pharmacy (n = 72); Civil Engineering (n = 71); Psychology (n= 58); Mechanical Engineering (n = 44); Chemical Engineering (n = 32); Software and Electrical Engineering (n = 31); Production Engineering (n = 31); Environment Engineering (n = 21).

Instruments

Entrepreneurial Intention Scale. Self-report and unifactorial (Entrepreneurial Intention – $\alpha = .940$, $\omega = .941$) instrument with 4 items on its short format. It uses 5 points Likert response type scale. Different studies showed its psychometrical adequacy in cross-cultural assessment proposals (Liñán & Chen, 2009; Cortez, Cassepp-Borges, & Hauck, 2019).

Entrepreneurial Motives Scale. Self-report instrument with 6 items and 2 factors (Productive Motives – $\alpha = .836$, $\omega = .839$; Unproductive Motives – $\alpha = .752$, $\omega = .777$) in short format. It uses 5 points Likert response type scale. Before internal structure evidence

and internal consistency examination between test and retest showed robustness for the instrument (Hmieleski & Lerner, 2016; Cortez & Hauck, 2019).

Levenson Psychopathy Scale. Self-report scale with 26 items and 2 factors (Primary Psychopathy – $\alpha = .701$, $\omega = .710$; Secondary Psychopathy – $\alpha = .610$, $\omega = .650$). It uses 5 points Likert response type scale. It has robust psychometric evidence for cross-cultural assessment of psychopathy in non-clinical perspectives (Hauck & Teixeira, 2014; Levenson et al., 1995).

Procedures

We registered the project in Brazilian Institutional Ethical Committee (CAAE: 91796218.5.0000.5514). The test administration among undergraduate students occurred in the classroom during activities interval. The whole application using pencil and paper format took from 15 to 20 minutes in each administration.

Data Analysis

We used exploratory factor analysis in software Mplus 7 to test the measurement model adjustment of each instrument. Model fit with exploratory factor analysis worked properly for entrepreneurial motives and entrepreneurial intention but shown the possibility of improvement for Levenson's scale. For that purpose, we followed literature guidelines to improve self-report measurement of personality, once we found that response style bias could interfere in assessing negative personal characteristics like psychopathy with the use of self-report instruments (King & Bruner, 2000; Paulhus, 1991; Paunonen & LeBel, 2012). Specifically, we found that the implementation of factor analysis, with two evaluative factors (acquiescence response bias and social desirability response bias) not correlated with Levenson's descriptive factors (primary psychopathy

and secondary psychopathy), could be useful for improving the measurement model adjustment and its relation with others variables (Aichholzer, 2014).

In the evaluative factor of acquiescence, we fixated variance of items in that factor at 1, considering it is a regular personal tendency of assenting with items (Danner, Aichholzer, & Rammstedt, 2015; Zanon, Lessa, & Dellazzana-Zanon, 2018). In the case of social desirability factor, we fixated items' variance with the z-score of raters' mean evaluation of social desirability for each Levenson's item made by a population similar to our respondents (Pettersson et al., 2014). For that group, we recruited 40 undergraduate students and explained what is social desirability. Next, we asked them to assess in a Likert type scale of 9 points (1 = Not socially desirable; 9 = Totally socially desirable) if the Levenson's item would socially desirable or not for others undergraduate students. Undergraduate students' evaluation of social desirability obtained an intraclass correlation of .982 [UB = .991; LB = .971] which shown consistency for application on modelling (Hallgren, 2012; Shrout & Fleiss, 1979).

Finally, we tested the predictive model using Structural Equation Modelling (SEM) in Mplus 7. At first, we tested the regular predictive model using Levenson's exploratory factor analysis structure. Next, we tested the improved predictive model using Levenson's factor analysis with two evaluative factors structure (acquiescence and social desirability response style). In all the factor analysis and modelling of our present study, we used WLSMV estimator and polychoric correlation as it has shown a better fit for estimation of models with categorical indicators and latent variables (Finney & DiStefano, 2013; Özdemir, Toraman, & Kutlu, 2019; Zambrano Leal, 2012).

Results

Measurement model adjustment for the entrepreneurial intention scale and entrepreneurial motives scales got elevated indexes when applying exploratory factor

analysis. For Levenson's psychopathy scale, exploratory factor analysis adjustment was reasonable, but we identified a better fit when using two evaluative factors in factor analysis to improve Levenson's psychopathy scale internal structure. We also analysed discriminant validity between measurement models, which were adequate demonstrating factor loading higher than .40 for all the models and low correlation between factors of different measurement scales. Measurement models fit indexes for each scale are in Table 1C.

Table 1C.
Measurement model adjustment for instruments

Model	Length	Factors	χ^2/gl	CFI	GFI	RMSEA
EI	4 items	1	0.033	.999	.999	.056
EM	6 items	2	2.349	.997	.987	.045
Regular Levenson	26 items	2	3.270	.901	.887	.058
Improved Levenson	26 items	2	2.483	.937	.926	.047

Note. EI = Entrepreneurial intention; EM = Entrepreneurial motives.

After inspecting measurement model adjustment for each scale, we propose the predictive model. First, we used regular Levenson and, subsequently, we applied improved Levenson. For the first predictive model, we used the regular Levenson structure in order to predict productive and unproductive entrepreneurial motives and entrepreneurial intention. We also tested the impact of productive and unproductive entrepreneurial motives in entrepreneurial intention.

The first predictive model obtained reasonable fit indexes ($\chi^2/\text{gl} = 2.573$; CFI = .961; GFI = .957; RMSEA = .048). Primary psychopathy shown negative effect in productive entrepreneurial motives ($\beta = -.268$; $p = .048$), but it got a positive effect in unproductive entrepreneurial motives ($\beta = .668$; $p = .039$) and entrepreneurial intention ($\beta = .071$; $p = .042$). Secondary psychopathy evidenced negative effect in productive entrepreneurial motives ($\beta = -.074$; $p = .053$) and in entrepreneurial intention ($\beta = -.151$; $p = .046$), but it shown a positive effect in unproductive entrepreneurial motives ($\beta = .213$; $p = .049$).

Productive entrepreneurial motives had a positive effect in entrepreneurial intention ($\beta = .084$; $p = .047$), but with lower magnitude when compared to the effect of unproductive entrepreneurial motives in entrepreneurial intention ($\beta = .298$; $p = .044$). The diagrammatic representation of that model is in Figure 2C.

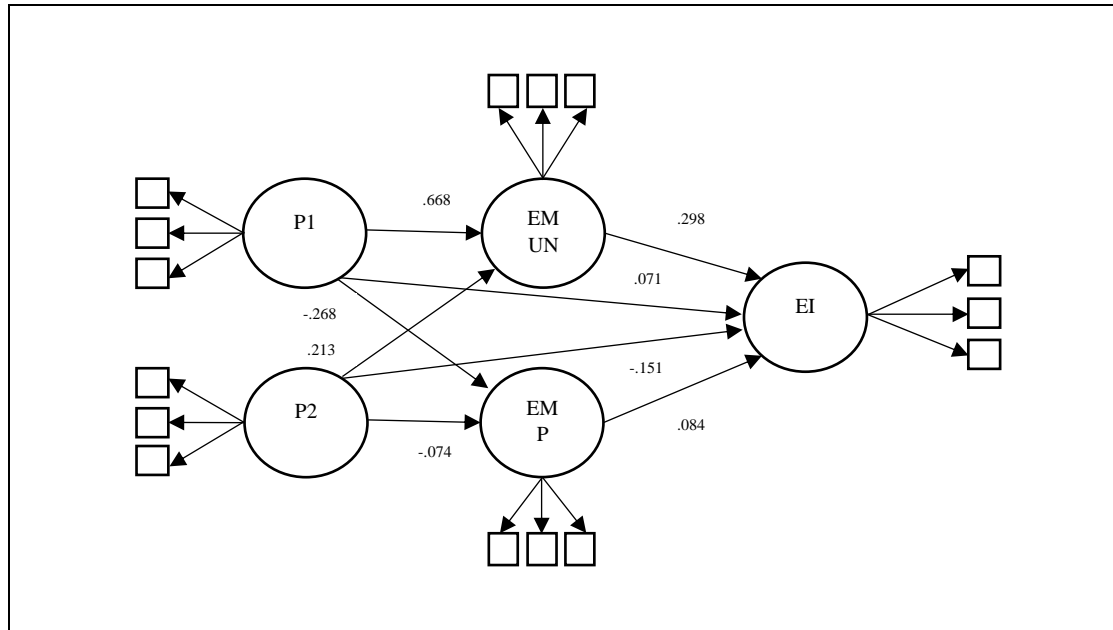


Figure 2C. Representation of the first predictive model

Note. P1 = Primary psychopathy; P2 = Secondary psychopathy; EM UN = Unproductive entrepreneurial motives; EM P = Productive entrepreneurial motives; EI = Entrepreneurial intention.

For the second predictive model, we kept the same structure of the first model for the relations between latent variables. We explored the prediction of primary and secondary psychopathy in productive and unproductive entrepreneurial motives and entrepreneurial intention. As we also did in the first model, we also examined the relation of productive and unproductive entrepreneurial motives in entrepreneurial intention. When compared to the first model, we only added to this second model the two random intercept factors (social desirability factor acquiescence) for a better estimation of primary and secondary psychopathy scores.

Second predictive model with the two evaluative factors optimized its adjustments ($\chi^2/df = 2.573$; CFI = .961; GFI = .957; RMSEA = .048) and relations when compared to the first model. Primary psychopathy shown negative effect in productive entrepreneurial

motives ($\beta = -.284$; $p = .052$) and positive effects in unproductive entrepreneurial motives ($\beta = .714$; $p = .041$) and entrepreneurial intention ($\beta = .079$; $p = .045$). Secondary psychopathy had positive effect in unproductive entrepreneurial motives ($\beta = .226$; $p = .048$) and negative effects in productive entrepreneurial motives ($\beta = -.073$; $p = .056$) and entrepreneurial intention ($\beta = -.158$; $p = .048$). When predicting entrepreneurial intention, productive ($\beta = .084$; $p = .047$) and unproductive ($\beta = .298$; $p = .044$) entrepreneurial motives got a positive effect on entrepreneurial intention. The second predictive model with Levenson's improved structure is in Figure 3C.

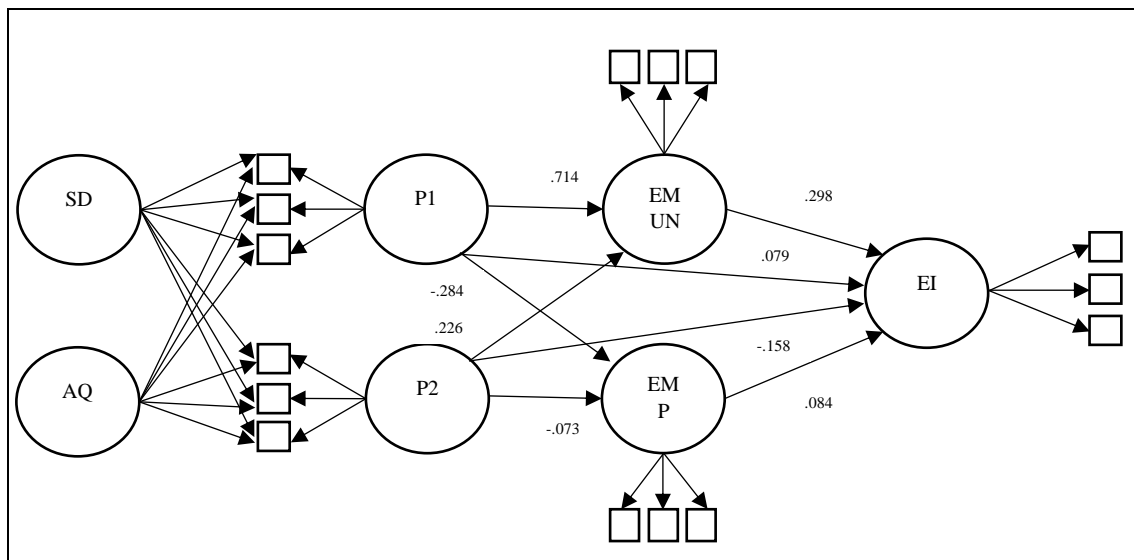


Figure 3C. Representation of the second predictive model with two evaluative factors
Note. SD = Evaluative factor of social desirability response style; AQ = Evaluative factor of acquiescence; P1 = Primary psychopathy; P2 = Secondary psychopathy; EM UN = Unproductive entrepreneurial motives; EM P = Productive entrepreneurial motives; EI = Entrepreneurial intention.

Discussion

In the present study, we aimed to test the relations between entrepreneurial motives and intention considering personality traits of psychopathy as a predictor. To that purpose, we first identified an optimal factorial structure to entrepreneurial intention, entrepreneurial motives and Levenson scale. Then, we tested the relations between variables. Finally, we identified that the relationship between psychopathy, motivational and pre-action characteristics of potential entrepreneurs shown a better adjustment if we

implement evaluative factors for personality assessment that controls response style bias like social desirability and acquiescence in our model.

The measurement models adjustments evidence that instruments seem adequate and reliable to an exploratory assessment of entrepreneurial intention, entrepreneurial motives and psychopathy Brazilian undergraduate students. In the case of entrepreneurial intention, it shows new evidence for the replication of Liñán and Chen (2009) as a representation of pre-action characteristics of potential entrepreneurs. It also confirms the robustness of entrepreneurial motives questionnaire (Hmieleski & Lerner, 2016) and its importance to assess additional dimensions of entrepreneurship as affective and motivational states. Levenson's instrument adequacy also highlights its high standard for psychopathy assessment (Levenson et al., 1995), including the cultural adaptation made by Hauck and Teixeira (2014) for Brazilian undergraduate students.

When considering the predictive models, we found primary psychopathy as a positive predictor of unproductive entrepreneurial motives and entrepreneurial intention, while it addresses negative effect on productive entrepreneurial motives. It may allow us to infer that personnel characteristics like manipulation (Grieve & Mahar, 2010), calculative commitment (Hafer, Bègue, Choma, & Dempsey, 2005), lack of fear (Lilienfeld et al., 2012), lack of guilt (Gong, Brazil, Chang, & Sanfey, 2019), lack of remorse (Spice, Viljoen, Douglas, & Hart, 2015) and lack of anxiety (Burns, Roberts, Egan, & Kane, 2015) may boost entrepreneurial intention and possible venture creation, despite the fact it also maximizes unproductive entrepreneurial motives and diminish productive entrepreneurial motives. Primary psychopathy may lead to future venture creation, but more motivated by exploration of social values in own business, instead of generating social value (Hmieleski & Lerner, 2016).

In a further comprehension of the predictive models, we also realised that secondary psychopathy was a positive predictor of unproductive entrepreneurial, but it

had a negative effect on entrepreneurial intention and productive entrepreneurial motives. In this case, personnel characteristics like fear (Schultz, Balderston, Baskin-Sommers, Larson, & Helmstetter, 2016), remorse (Tangney, Stuewig, & Hafez, 2011), social deviance (Cooke, Michie, Hart, & Clark, 2004), impulsivity (March, Grieve, Marrington, & Jonason, 2017), aggression (Guerra & White, 2017), self-destruction (Fadoir, Lutz-Zois, & Goodnight, 2019), disorganization (Gullhaugen & Sakshaug, 2019) and emotional dysregulation (Garofalo, Neumann, & Velotti, 2018) may difficult entrepreneurial intention, especially when it is based on a productive entrepreneurial motive, instead of maximizing unproductive entrepreneurial motives. For that conception, secondary psychopathy possible lower individuals' possibility of acting for new venture creation and social value generation, while stimulates the idea of becoming an entrepreneur for social exploration (Hmieleski & Lerner, 2016).

In both cases, it is early to conclude that primary psychopathy may be adaptive to become a future entrepreneur and secondary psychopathy may be dysfunctional if we consider the entrepreneurial intention (Kraus, Berchtold, Palmer, & Filser, 2018; Wu, Wang, Zheng, & Wu, 2019). It seems more reliable to infer that entrepreneurial education based in the entrepreneurial potential approach may consider individuals motives of undergraduate students as it seems a core component for further developments in new venture creation when we focus on personal motivators for exploring or generating social value through venture creation (Aeeni, Motavaseli, Sakhdari, & Dehkordi, 2019). Further studies must realise if there are substantial changes between actual and potential entrepreneurs, clinical and non-clinical manifestations of psychopathy and in what range is possible to modulate individuals' entrepreneurial motives to a more ethical, healthy and positive perspective in order to achieve new venture creation with optimal humanized conditions of governance (Lundmark & Westelius, 2019).

Nevertheless, we also verified in the predictive models that both entrepreneurial motives got a positive effect on entrepreneurial intention, although unproductive entrepreneurial motives had a higher effect on entrepreneurial intention than productive entrepreneurial motives. Based on the variables investigated in our model, we hypothesised that what drives potential entrepreneurs are unproductive entrepreneurial motives (explore social value) rather than productive entrepreneurial motives (generate social value). Those dynamics allow inferring that venture generated by those future entrepreneurs may impact in a predominant aggressive, exploratory and unethical of governance instead of social well-being if unproductive entrepreneurial motives keep on nursing as the main personnel motivators for entrepreneurial intention. In Brazil, a country where unethical governance already figures as a social issue, it is essential to highlight that the comprehension of evaluative perspective of entrepreneurship and its motives when analysing entrepreneurial potential is crucial. Future entrepreneurs are important social actors for the development of Brazilian economic and social institutions and may guide it through positive or negative governance relying on personal motivators that must be centred in entrepreneurial potential further analysis (Bersch, Praça, & Taylor, 2017; Bologna & Ross, 2015).

As a limitation of our study, we point out the restriction between different courses and non-balanced sampling among them. We highlight as a contribution to the comprehension of entrepreneurial motives and its relations with other variables as a prior guideline for an exploratory proposition about ethical governance in the literature of potential entrepreneurship approach. Again, it urges the necessity for further development seeking if that model may be replicated in other populations and nationalities in order to address a proper ethical governance development agenda for entrepreneurial education practices that focus the potential entrepreneur approach. It is also fundamental to point out as a contribution of our study that could be included in for further development in that

theme, the control of acquiescence and social desirability response style that optimized most of the effects size from our model, as prior researchers also did in prior modelling studies (Biderman, McAbee, Hendy, & Chen, 2019; Pettersson et al., 2014).

Finally, we had the apprehension that entrepreneurial potential studies, focusing negative characteristics and dilemmatic issues of entrepreneurs, could foster and contribute for future entrepreneurship investigation focusing on ethical governance and entrepreneur's health more effectively when controlling bias created by different response styles. In that case, the use of modern methods to control those type of response bias may be useful for future development focusing on scoring individuals' entrepreneurial characteristics and its relationships with other variables. As demonstrated in the current study, those methods could offer more compelling evidence in order to guide policymaking and entrepreneurial education agenda based in more reliable indicators that could foster ethical and healthy governance as one goal in entrepreneurship literature. That evidence drives for a future research agenda, which self-report response style and its control methods should be integrated into the entrepreneurship research.

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Chapter 3

General Discussion

The current thesis aimed to propose evidence to the measurement of potential entrepreneurs' characteristics with Brazilian undergraduate students and test an evidence-based model to guide the development of entrepreneurial potential investigations and practices among that public. Considering the three studies of the thesis contributions, it successfully achieved its objectives, once the cultural adaptation and test of the validity evidence of entrepreneurial motives scales and entrepreneurial intention went satisfactory when considering theoretical, idiomatical and psychometrics proprieties of the instruments (Hambleton & Lee, 2013).

The test of the relations between entrepreneurial intention and entrepreneurial motives, considering psychopathy as a predictor, also went appropriate demonstrating the inefficacy of the current neutral entrepreneurial potential literature as a development agenda for that research field. It also evidenced that modern psychometrics methods can improve measurement models and their relations with other variables, mainly when method and response style bias is controlled (Danner et al., 2015; Maydeu-Olivares & Steenkamp, 2019).

Specifically, in the first study, the entrepreneurial motives cultural adaptation and psychometric properties were adequate, not only demonstrating its efficacy to assessment with Brazilian undergraduate students but also improving the measurement model on the international literature with the use of modern psychometrics for control methods bias (Hmieleski & Lerner, 2016; Podsakoff et al., 2012). Taking in a note the second study, the psychometric properties and cultural adaptation of the scale also was appropriated. In that comprehension, Entrepreneurial Intention Questionnaire seems reasonable to the assessment of entrepreneurial intention among undergraduate students in Brazil, while

the brief short version generated by Genetic Algorithm also seems optimal and innovative to international literature as new internal structure evidence to that instrument (Eisenbarth et al., 2015; Liñán & Chen, 2009).

Considering the model tested in the third study, it is visible that the implementation of modern psychometrics methods optimises the relationship among variables improving the quality of evidence when comparing the model without control of response bias with the one that response biases were controlled (Schreiber, Stage, King, Nora, & Barlow, 2006). In view of the effects, psychopathy predicts even more substantially unproductive entrepreneurial motives and entrepreneurial intention when controlling response bias. Furthermore, the unproductive entrepreneurial motives, that is more associated with both factors of psychopathy, primary and secondary, seems to have a more significant effect on entrepreneurial intention than productive entrepreneurial motives.

Based in that evidence, it is possible to hypothesize two theoretical explanations from national and international literature for the relationships evidenced in the third model that could foster the triad basis as one practical contribution to potential entrepreneur area. The first one, mainly from international literature, focus on individual characteristics as predominant to an individual's professional motivation and interests, which would explain the psychopathy associated with entrepreneurship (Kowalski, Vernon, & Schermer, 2017; Othman & Othman, 2015). There are plenty studies that show individuals attribute associated with personnel dark side as possible adaptative for business and economics contexts (Jonason, Wee, Li, & Jackson, 2014; Spurk, Keller, & Hirschi, 2016). On some of those situations, psychopathy characteristics like personnel manipulation, dissimulation, aggressivity, could be valid for the leadership role of the future entrepreneur, while in others impulsivity could be useful for taking risks in investments (Smith & Lilienfeld, 2013; Volmer, Koch, & Göritz, 2016).

Despite the fact that this comprehension seems an important explanation, when considering individuals professional planning and future human resources allocation, that contribution is quite limited to generate societal hypothesis for the relations identified in the third model (Grote & Hall, 2013; Louis, 1982). In order to contribute in-depth comprehension of the social role of the entrepreneur and why it is evidenced as associated with negative characteristics, considering that the entrepreneurial potential seems a neutral development agenda, the explanations to potential entrepreneurship identified in narrative entrepreneurship in international studies and critical social entrepreneurship in Brazilian literature seem essential.

For narrative entrepreneurship, individual's personal history and motivational processes involve a psychosocial element from the culture, whence individuals capture social norms and ideological values that associated with personal characteristics turn into actions in the daily life (Byrne & Shepherd, 2015; Downing, 2005; Gartner, 2007). In the case of the entrepreneurial narrative, those values would mainly derivate from the economic system and ideas of effectivity, profit, wealth maximization that would make individuals intentionally or unconsciously express psychopathy characteristics like selfish, personal exploiting, lack of remorse, and guilty and indifference as personal motivation to obtaining high efficacy and partial adaptation during the entrepreneurial process (Fennimore & Sementelli, 2016; Gaddefors & Anderson, 2017; Gehman & Soublière, 2017).

That idea is complemented from the evidence of Brazilian literature of critical entrepreneurship analysis, once this area usually identifies the ideological and normative concept of our current economic system as neutral or positive in different cultural manifestation and narratives (Laval, 2017; Nascimento, Coelho, Tavares, & Rodrigues, 2019). However, in practical terms, it seems highly associated with the minimization of production costs in order to maximize effectivity and profit for organizations and,

individually, for the entrepreneur agent (Casaqui, 2017; Costa et al., 2011). In this dynamics, once maximal efficiency to allocate productive resources and innovation is achieved, the enterprise can only become more productive if starts to make lower the costs with human resources and environmental externalities (Fafchamps & Hamine, 2017). In that example, it would imply in precarious work conditions to human resources and overconsumption and destruction of the environment. Especially, if the entrepreneurial agent does not take into account the implications of the activity to formulate organisational purposes and its directions.

After all, how would it be possible for the potential entrepreneur, as a human being, to choose to exploit human resources and destroy the environment without psychopathy? A qualitative agenda on subclinical expressions of those characteristics in different contexts would permit insights about this question in order to minimise its negative influences under business generation focusing on a positive human and social development for enterprise creation in the entrepreneurial potential approach (Berglund, 2015). Perhaps this question could also be answered by considering that it is not a conscious process, given that influences in the cultural and ideological field can impact on behavior, even if unknown to the agent about its influence (Swidler, 1986). Current development and future research about entrepreneurial bias, especially demonstrating relations between motivational processes and decision making to generate new business, would address contributions for that issue (Burmeister & Schade, 2007; Zhang & Cueto, 2017).

In the case of the current thesis, we focused on the idea that even if psychopathy seems adaptative to the current state of entrepreneurship field and its economic and social practices, it is not desirable if it comes by human and environment costs (Buchanan & Faith, 1981; Dean & McMullen, 2007; Wach, Stephan, & Gorgievski, 2016). There are studies addressing that the efficacy of human capital exploration is only possible at short

term because, in long terms, the entrepreneurial agent and co-workers would probably become fatigued and with severe occupational and mental health issues (Cardon & Patel, 2015; Gorgievski, Moriano, & Bakker, 2014; Gubler, Larkin, & Pierce, 2018; Patel & Thatcher, 2014). In the environmental perspective, the current crisis considering projected natural resource scarcity and increasing pollution level that may turn human existence possible unfeasible also shows importance to redesign our developmental concepts based on new market dynamics and social policy guidance (Dellink, Chateau, Lanzi, & Magné, 2017; Theodoraki, Messeghem, & Rice, 2018).

By that perspective, the current neutral entrepreneurial potential approach fails as a developmental social agenda, because, as prior evidenced in the third model, it seems correlated with negative characteristics that may imply in human and environmental damage as an implication. In that sense, the current neutral perspective of entrepreneurial potential, actually, does not seem really neutral, but associated with psychopathy attributes, as expressed in the third model by unproductive entrepreneurial motives and its high effect on entrepreneurial intention and relations with primary and secondary psychopathy that may demonstrate its inefficacy as social policy development for entrepreneurship.

Focusing in that inefficacy, the practical contribution of the current thesis relies on triad basis as social policy guidance for future potential entrepreneurship development as a union between ideas of ontology and implications on entrepreneurial education and student's entrepreneurial potential. That new agenda is fundamental, in further comprehensions on the entrepreneurial potential literature associated to humanized ethics, health and well-being, because it may affirm as a possible influence to overcome human exploration and social crisis in the entrepreneurship process (Parente et al., 2018; Stephan, 2018; Wiklund et al., 2019).

Recapitulating the predominant model of action characteristics in entrepreneurship literature (Frese & Gielnik, 2014), we suggest two additions focusing on entrepreneurial potential: ontology and implications. The ontology perspective should focus on the different influence levels like national, market, social conditions and individuals in order to check if those different entrepreneurship aspects can act for personal development of social agents in those levels. It means the verification of its premises considering the foundational basis idea of humanized ethics, mental health, and well-being as the central qualification pillar of entrepreneurship ontology for individuals, society, market and national culture, for example. In order to operationalize that task, it is fundamental to overcome limitations from critical and narrative perspectives and rely on realists indicators that, essentially, materialize organizational practices (Chia, 2000).

As an instrumental realist approach to verify if those premises of the triad basis are implemented successfully to the personal development, the implication analysis before, during and after the venture creation is crucial to explicit the externalities on those different influence levels as an indicator of personal and social development (Cortez, Zerbini, & Veiga, 2019). We focus on the externalities as the core realist indicator, once it expresses the side effect of institutions and its practices, that may be useful to the evaluation of implicit aspects conditioning the entrepreneurial process ontology and its outcomes (Bonomi, Ricciardi, & Rossignoli, 2017).

In a dynamical perspective of that new model, it is only possible to obtain social development if the personal development of people, institutions, markets and nations are secured by the triad basis (humanized ethics, mental health and well-being) during the whole process of venture creation. Again, it is essential to highlight the focus of externalities on implication analysis after the entrepreneurial outcomes, once those are the neglected aspects of entrepreneurship research and organizational practices that usually evidence the gap of that field in individual, social conditions, market and national

influence level (Mariappanadar, 2012). For that analysis, it is vital to consider the humane entrepreneurship conception as an ethical epistemology, mainly its comprehension of entrepreneurial orientation, environment orientation and human resources orientation as a guideline to evaluate its ontology from externalities in different levels (Parente et al., 2018). The adapted action-characteristic model including the triad basis is synthesized in Figure 10.

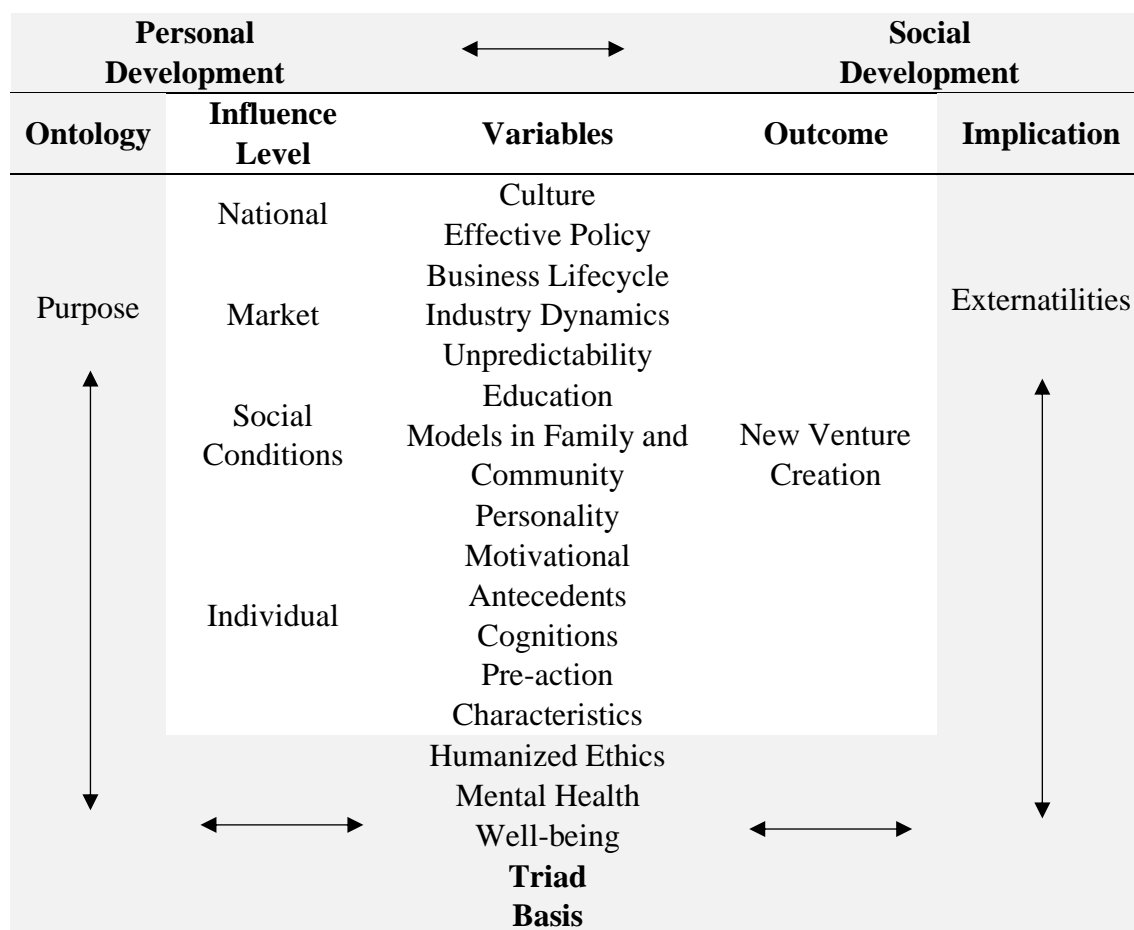


Figure 10. Adapted action-characteristic model of entrepreneurship and its level including the Triad Basis (Frese & Gielnik, 2014)

Specifically, in our research, the analysis of the relation between psychopathy and entrepreneurship (entrepreneurial motives and entrepreneurial intention) among undergraduate students can be considered an analysis of externalities focusing on human resources orientation, in the individual level. Entrepreneurship literature usually neglected the dark side of entrepreneur in order to build an exclusive narrative that the

entrepreneurial potential approach has utility for maximizing entrepreneurial intention, that is a pre-action characteristic, and boost the chances of individuals generate new business (Olaison & Sørensen, 2014; Tedmanson et al., 2012).

It is true that most of the ideas in the neutral entrepreneurial potential approach can influence positively entrepreneurial intention (Brandstätter, 2011; Cortez, 2017; Cortez & Veiga, 2019; Cortez, Veiga, & Salvador, 2019; Rueda et al., 2015). On the other hand, it is also factual that there are personal adverse effects in those influences, like its psychopathy relationship, that may depreciate this type of entrepreneurial intention (Aeeni et al., 2019; Hmieleski & Lerner, 2016; Spivack & McKelvie, 2018). Especially, if we consider the whole entrepreneurial process from the ontology to the implications, based on purpose, externalities and focusing on personal and social development as the main goal. In that apprehension, it is only possible to overcome that issue when entrepreneurial potential literature includes an evaluative base to guide further development, like the humanized ethics, mental health and well-being conception we offered as a triad proposal in this thesis.

Although those conceptions may seem uncommon in the multidisciplinary and interdisciplinary efforts, like the current thesis that focuses on applied psychology and psychometrics to enhance entrepreneurship assessment and concepts, those core foundations seem sensitive and highly accepted in others psychological fields, like social psychology or clinical psychology (Self, Wise, Beauvais, & Molinari, 2018; Sinclair, 2017). A psychologist that works on psychological assessment of individuals in communities or at hospitals, would not consider most of psychopathy attributes adaptative to individuals' self-improvement or communitarian development and would intervene in order to try to modulate the expression of that attribute in an adaptative manner to the contextual convivence – even if there is no conclusive evidence to generate a standard treatment intervention (D'Silva, Duggan, & McCarthy, 2004; Lewis, 2018; Salekin,

Worley, & Grimes, 2010). On the other hand, when those types of evaluative contributions are listed on psychological fields that subsidise business or interdisciplinary topics, as this thesis contributes to entrepreneurship literature, it is usual that part of peers discredit the proposal reviewing it as biased, unviable or irreconcilable with effective research practices, market and wealth development (Hewstone, Rubin, & Willis, 2002; Jones et al., 2018).

In response to those critical, the present thesis does not offer the current triad basis as a final proposal and do not guarantee equalization beyond the triad basis perspective and the traditional neutral approach of entrepreneurial potential on effectiveness to improve entrepreneurial intention and, subsequently, new business development. On the contrary, it only aims to demonstrate the inefficacy of the current neutral entrepreneurial potential approach by analysing contradictions of that field with the determination of provoking a new development agenda that ontology and implication are considered to promote entrepreneurship in a sustainable ecosystem that grants personal and social development (Bal et al., 2019).

As a limitation of the current thesis, we highlight the use of the same sample in the three studies that diminish the external validity of our evidence, that could be tested in other contexts and samples to check its replicability and improve the models' generalization (Lucas, 2003). Specifically, further studies should focus in the comprehension of those variables with a more variated types of entrepreneurs, once it can foster the application of the current evidence when considering differences between phases of business development and types of entrepreneurship. In that perspective, the integration of contextual variables in the current model, for example, opportunity or necessity-oriented entrepreneurship, that demonstrate a background of individual business foundation also seems fundamental for further advances in entrepreneurial potential approach and properly analysis of its ontology and implications. We highlight

that beyond individual's personality, motives and intention, there are contextual influences and needs in different levels that must be explored in order to drive correctly policymaking that effectively promotes individual and social development through entrepreneurial potential.

For the moment, considering the approach of psychology and psychometrics offered in the current thesis, ethics, mental health and well-being seems as core concepts for further advancements in entrepreneurial potential literature in Brazil, Latin America and worldwide. In that sense, the triad basis proposed here and its concepts urge for continuous development of those notions that, lately, could be improved in order to grant new advancements for personal and social development considering the humane entrepreneurship as a possible comprehension for social policy-making among potential entrepreneurs.

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Appendix

Appendix 1: Ethical Approval from the Institutional Committee

Você está em: Público > Buscar Pesquisas Aprovadas > Detalhar Projeto de Pesquisa

DETALHAR PROJETO DE PESQUISA

- DADOS DO PROJETO DE PESQUISA

Título Público: ESTUDOS PSICOMÉTRICOS E CONTROLE DE VIESES DE DESEJABILIDADE SOCIAL EM MEDIDAS DE EMPREENDEDORISMO
Pesquisador Responsável: Pedro Afonso Cortez
Contato Público: Pedro Afonso Cortez
Condições de saúde ou problemas estudados:
Descritores CID - Gerais:
Descritores CID - Específicos:
Descritores CID - da Intervenção:
Data de Aprovação Ética do CEP/CONEP: 13/08/2018



- DADOS DA INSTITUIÇÃO PROPONENTE

Nome da Instituição: Universidade São Francisco-SP
Cidade: BRAGANÇA PAULISTA

- DADOS DO COMITÊ DE ÉTICA EM PESQUISA

Comitê de Ética Responsável: 5514 - Universidade São Francisco-SP
Endereço: Av. São Francisco de Assis, 218, sala 35, prédio central
Telefone: (11)2454-8981
E-mail: comiteetica@usf.edu.br

- CENTRO(S) PARTICIPANTE(S) DO PROJETO DE PESQUISA

- CENTRO(S) COPARTICIPANTE(S) DO PROJETO DE PESQUISA

[Voltar](#)

Appendix 2: Example of research protocol with informed consent term, psychometric and sociodemographic instruments

Termo de Consentimento Livre Esclarecido

Pesquisa: Estudos psicométricos e controle de vieses de
desejabilidade social em medidas de empreendedorismo

Eu,....., abaixo assinado,
dou meu consentimento livre e esclarecido para participar
como voluntário do projeto de pesquisa supracitado, sob a
responsabilidade do(s) pesquisador(es) **Me. Pedro Afonso**
Cortez e Dr. Nelson Hauck Filho do curso de doutoramento
em Psicologia da Universidade São Francisco.

Assinando este Termo de Consentimento estou ciente de que:

- 1 - O objetivo da pesquisa é **verificar as propriedades psicométricas e controlar vieses relativos à desejabilidade social de escalas de empreendedorismo, bem como verificar a relação dessas medidas com personalidade, psicopatia e interesses profissionais;**
- 2- Durante o estudo você **deverá assinalar na escala do tipo de resposta o quanto você considera possuir das características descritas nos itens das medidas supracitadas, o que deve levar cerca de 25 minutos;**
- 3 - Obtive todas as informações necessárias para poder decidir conscientemente sobre a minha participação na referida pesquisa;
- 4- A resposta a estes instrumentos/procedimentos não causa riscos conhecidos à minha saúde física e mental, sendo provável, que causem fadiga e desconforto emocional;
- 5 - Estou livre para interromper a qualquer momento minha participação na pesquisa, o que não me causará nenhum prejuízo;
- 6- Meus dados pessoais serão mantidos em sigilo e os resultados gerais obtidos na pesquisa serão utilizados apenas para alcançar os objetivos do trabalho, expostos acima, incluída sua publicação na literatura científica especializada;
- 7 - Poderei contatar o Comitê de Ética em Pesquisa da Universidade São Francisco para apresentar recursos ou reclamações em relação à pesquisa pelo telefone: 11 – 2454 – 8981 e endereço Av. São Francisco de Assis, 218, Jardim São José – Bragança Paulista - SP;
- 8 - Poderei entrar em contato com os responsáveis pelo estudo, **Me. Pedro Afonso Cortez e Dr. Nelson Hauck Filho**, sempre que julgar necessário pelo e-mail cor.afonso@gmail.com.
- 9 - Este Termo de Consentimento é feito em duas vias, sendo que uma permanecerá em meu poder e outra com o pesquisador responsável.

Campinas, de 2019

Assinatura do Participante:

Assinatura do Pesquisador Responsável



Termo de Consentimento Livre Esclarecido

(DESTACAR ESTA VIA DO TERMO PARA VOCÊ)

Pesquisa: Estudos psicométricos e controle de vieses de
desejabilidade social em medidas de empreendedorismo

Eu,....., abaixo assinado,
dou meu consentimento livre e esclarecido para participar
como voluntário do projeto de pesquisa supracitado, sob a
responsabilidade do(s) pesquisador(es) **Me. Pedro Afonso**
Cortez e Dr. Nelson Hauck Filho do curso de doutoramento
em Psicologia da Universidade São Francisco.

Assinando este Termo de Consentimento estou ciente de que:

- 1 - O objetivo da pesquisa é **verificar as propriedades psicométricas e controlar vieses relativos à desejabilidade social de escalas de empreendedorismo, bem como verificar a relação dessas medidas com personalidade, psicopatia e interesses profissionais;**
- 2- Durante o estudo você **deverá assinalar na escala do de resposta o quanto você considera possuir das características descritas nos itens das medidas supracitadas, o que deve levar cerca de 25 minutos;**
- 3 - Obtive todas as informações necessárias para poder decidir conscientemente sobre a minha participação na referida pesquisa;
- 4- A resposta a estes instrumentos/procedimentos não causa riscos conhecidos à minha saúde física e mental, sendo provável, que causem fadiga e desconforto emocional;
- 5 - Estou livre para interromper a qualquer momento minha participação na pesquisa, o que não me causará nenhum prejuízo;
- 6- Meus dados pessoais serão mantidos em sigilo e os resultados gerais obtidos na pesquisa serão utilizados apenas para alcançar os objetivos do trabalho, expostos acima, incluída sua publicação na literatura científica especializada;
- 7 - Poderei contatar o Comitê de Ética em Pesquisa da Universidade São Francisco para apresentar recursos ou reclamações em relação à pesquisa pelo telefone: 11 – 2454 – 8981 e endereço Av. São Francisco de Assis, 218, Jardim São José – Bragança Paulista - SP;
- 8 - Poderei entrar em contato com os responsáveis pelo estudo, **Me. Pedro Afonso Cortez e Dr. Nelson Hauck Filho**, sempre que julgar necessário pelo e-mail cor.afonso@gmail.com
- 9 - Este Termo de Consentimento é feito em duas vias, sendo que uma permanecerá em meu poder e outra com o pesquisador responsável.

Campinas, de 2019

Assinatura do Participante:

Assinatura do Pesquisador Responsável:



Prezado(a) Participante,

Este instrumento busca avaliar sua percepção pessoal sobre si mesmo e ideias e pensamentos associados ao empreendedorismo. **Por isso, não existe resposta certa, nem errada. Fique à vontade para responder conforme desejar.**

Empreendedorismo

Para começar, pense um pouco os motivos que seriam importantes para você quando fosse empreender. Em seguida, assinale conforme a escala de respostas a seguir:

1	2	3	4	5
Nada importante	Pouco importante	Importante	Muito importante	Extremamente importante

Se algum dia eu fosse empreender, eu acredito que me motivaria para...						
1	Atingir sucesso financeiro, mesmo que isso seja destrutivo para o meio ambiente e sociedade.	1	2	3	4	5
2	Maximizar o lucro, mesmo que custe o bem-estar dos empregados.	1	2	3	4	5
3	Crescer rapidamente, mesmo que isso signifique sacrificar a qualidade.	1	2	3	4	5
4	Conseguir lucros financeiros a qualquer custo.	1	2	3	4	5
5	Terceirizar serviços para reduzir custos o máximo possível.	1	2	3	4	5
6	Gerar benefícios para a sociedade.	1	2	3	4	5
7	Criar produtos e serviços que melhoram as vidas das pessoas.	1	2	3	4	5
8	Desenvolver um ambiente empresarial em que empregados valorizam seus trabalhos.	1	2	3	4	5
9	Ser admirado pelos benefícios gerados para a comunidade.	1	2	3	4	5
10	Atrair empregados que valorizem o compromisso social da empresa como se fossem deles mesmos.	1	2	3	4	5

Empreendedorismo

Considere agora a quantidade de vezes que você pensa ou planeja empreender e assinale conforme a escala de resposta a seguir:

1	2	3	4	5
Discordo totalmente	Discordo	Concordo parcialmente	Concordo	Concordo totalmente

Em um futuro próximo...						
1	Eu farei qualquer coisa para me tornar empreendedor.	1	2	3	4	5
2	Meu objetivo profissional é me tornar empreendedor.	1	2	3	4	5
3	Eu farei todo o esforço possível para abrir minha firma.	1	2	3	4	5
4	Eu estou determinado a criar uma firma no futuro.	1	2	3	4	5
5	Eu penso seriamente em começar um negócio.	1	2	3	4	5
6	Eu tenho a intenção de abrir uma firma algum dia.	1	2	3	4	5

Personalidade

Pense um pouco sobre seus comportamentos e pensamentos e registre, conforme a escala de respostas a seguir, o quanto que você se identifica com os adjetivos no seu dia-a-dia:

1	2	3	4	5
Nunca	Poucas vezes	Algumas vezes	Muitas vezes	Sempre

1	Responsável	1	2	3	4	5
2	Esforçado	1	2	3	4	5
3	Organizado	1	2	3	4	5
4	Dedicado	1	2	3	4	5
5	Filosófico	1	2	3	4	5
6	Artístico	1	2	3	4	5
7	Criativo	1	2	3	4	5
8	Aventureiro	1	2	3	4	5
9	Gentil	1	2	3	4	5
10	Bondoso	1	2	3	4	5
11	Simpático	1	2	3	4	5
12	Amável	1	2	3	4	5
13	Ansioso	1	2	3	4	5
14	Inseguro	1	2	3	4	5
15	Pessimista	1	2	3	4	5
16	Aborrecido	1	2	3	4	5
17	Comunicativo	1	2	3	4	5
18	Quieto	1	2	3	4	5
19	Tímido	1	2	3	4	5
20	Desembaraçado	1	2	3	4	5

Sociodemográficos

Idade: _____ anos Gênero: Masculino () Feminino () Outros () Curso: _____ Semestre: _____ Turno de estudo: Matutino () Noturno () Integral ()	Trabalha: Sim () Não () - Período: Parcial () Integral () Já possui o próprio negócio? Sim () Não () Pretende criar o próprio negócio? Sim () Não () Pensava em empreender antes da faculdade? Sim () Não () Algum familiar possui a própria empresa? Sim () Não ()
--	---

Personalidade

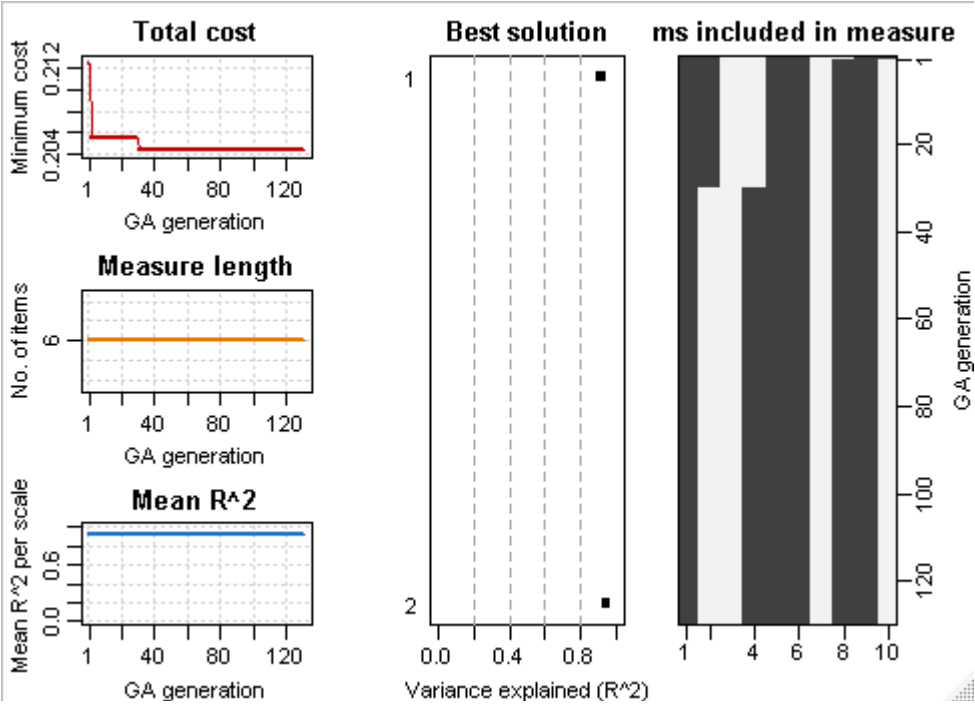
Para finalizar, a seguir, você encontrará frases que descrevem várias características que as pessoas podem apresentar em maior ou menor magnitude. Use a escala abaixo, e assinale um número para indicar o quanto cada afirmação se aplica a você.

1	2	3	4
Não se aplica a mim			Aplica-se totalmente a mim
1	A vida é baseada na sobrevivência do mais forte; eu não me importo com os fracassados.	1	2 3 4
2	Para mim, correto é aquilo que me faz “levar a melhor”.	1	2 3 4
3	No mundo de hoje, acho justo fazer qualquer coisa para me dar bem.	1	2 3 4
4	Meu principal objetivo na vida é acumular o maior número de bens que eu puder.	1	2 3 4
5	Fazer dinheiro é a minha meta mais importante.	1	2 3 4
6	Eu deixo os outros se preocuparem com valores morais; meu objetivo é apenas vencer.	1	2 3 4
7	As pessoas que são burras o suficiente para serem enganadas geralmente merecem isso.	1	2 3 4
8	Cuidar de mim mesmo é a minha maior prioridade.	1	2 3 4
9	Digo às outras pessoas o que elas querem ouvir para que elas façam o que eu quero.	1	2 3 4
10	Eu ficaria chateado se meu sucesso viesse à custa de outras pessoas.	1	2 3 4
11	Eu geralmente admiro um golpista inteligente.	1	2 3 4
12	Eu tento cuidar para não magoar outras pessoas para atingir minhas metas.	1	2 3 4
13	Eu gosto de me aproveitar dos sentimentos das pessoas.	1	2 3 4
14	Eu me sinto arrependido se falo ou se faço coisas que causam sofrimento a outras pessoas.	1	2 3 4
15	Mesmo se eu estivesse me esforçando para vender alguma coisa, eu não mentiria.	1	2 3 4
16	Trapacear não é correto porque é injusto com as outras pessoas.	1	2 3 4
17	Eu me meto nos mesmos problemas repetidamente.	1	2 3 4
18	Eu me entedio com frequência.	1	2 3 4
19	Eu consigo perseguir um objetivo em longo prazo.	1	2 3 4
20	Eu não planejo nada com muita antecedência.	1	2 3 4
21	Eu rapidamente perco o interesse por tarefas que início.	1	2 3 4
22	A maioria dos meus problemas se deve ao fato de que as pessoas não me entendem.	1	2 3 4
23	Antes de fazer qualquer coisa, eu penso com cuidado nas possíveis consequências.	1	2 3 4
24	Eu tenho me envolvido em muitas discussões com outras pessoas.	1	2 3 4
25	Quando eu fico frustrado, eu descarrego minha raiva de alguma forma.	1	2 3 4
26	As pessoas dão valor demais ao amor.	1	2 3 4

Por favor, verifique se você assinalou uma opção em cada uma das frases.

Obrigado pela participação!

Appendix 1A: Genetic Algorithm outcomes to entrepreneurial motives abbreviation



Appendix 1B: Genetic Algorithm outcomes to entrepreneurial intention abbreviation

