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ARTICLE

Propensity to entrepreneurship and its antecedents: development and validation of a measurement scale

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Abstract

This article develops and validates a Measurement Scale of the Propensity to Entrepreneurship and its Antecedents (MSPEA). The theoretical basis concerns the Propensity to Entrepreneurship and the previous individual characteristics (innovative behavior, need for autonomy, need for achievement, proactivity, self-efficacy, locus of internal/external control, tolerance/intolerance to ambiguity, risk propensity, and risk aversion). The methodological procedures involved the qualitative (selection of individual characteristics and elaboration of items) and quantitative approaches through multivariate data analysis. The results reveal that all constructs meet the necessary parameters for performing Exploratory Factor Analysis (EFA). After reduction, all presented good reliability with Cronbach's alpha greater than 0.70, indicating that all MSPEA constructs are statistically reliable. In the final version, 56 items remained, 9 of which were of Propensity to Entrepreneurship and 47 of individual characteristics. The elaboration of items to measure the propensity to entrepreneurship and the identification of a set of individual characteristics preceding it expands the understanding of this theme since several studies did not measure it as a construct, which is the main contribution of this study. Considering that EFA is an interdependence technique in which factors are formed to show the explanatory power of a set of variables, not allowing one or more factors to be considered predictors of another factor, future research could perform the Confirmatory Factor Analysis proposing a model of how these antecedent individual characteristics can be directly or indirectly related to the Propensity to Entrepreneurship.

Keywords: Development and Validation. Scale. Propensity to Entrepreneurship.

Propensão ao empreendedorismo e seus antecedentes: desenvolvimento e validação de uma escala de medição

Resumo

O objetivo foi desenvolver e validar uma Escala de Mensuração da Propensão ao Empreendedorismo e seus Antecedentes (EMPEA). A base teórica diz respeito à Propensão ao Empreendedorismo e às características individuais prévias (comportamento inovador, necessidade de autonomia, necessidade de realização, proatividade, autoeficácia, locus de controle interno/externo, tolerância/intolerância à ambiguidade, propensão ao risco e aversão ao risco). Os procedimentos metodológicos são um estudo misto, utilizando as abordagens qualitativa (seleção de características individuais e elaboração de itens) e quantitativa, por meio de análise multivariada de dados. Os resultados revelam que todos os construtos atendem aos parâmetros necessários para a realização da Análise Fatorial Exploratória (AFE). Após a redução, todos apresentaram boa confiabilidade com alfa de Cronbach maior que 0,70, indicando que todos os construtos do EMPEA são estatisticamente confiáveis. Na versão final, restaram 56 itens, sendo 9 de Propensão ao Empreendedorismo e 47 de características individuais. A elaboração de itens para mensurar a propensão ao empreendedorismo, bem como a identificação de um conjunto de características individuais que o antecedem, amplia o entendimento sobre esse tema, uma vez que diversos estudos não o mensuraram como construto, sendo esta a principal contribuição do presente estudar. Considerando que a AFE é uma técnica de interdependência na qual os fatores são formados para mostrar o poder explicativo de um conjunto de variáveis, não permitindo que um ou mais fatores sejam considerados preditores de outro fator, pesquisas futuras poderiam realizar a Análise Fatorial Confirmatória propondo um modelo de como essas características individuais antecedentes podem estar direta ou indiretamente relacionadas à Propensão ao Empreendedorismo.

Palavras-chave: Desenvolvimento e validação. Escala. Propensão ao empreendedorismo.

Propensión al emprendimiento y sus antecedentes: desarrollo y validación de una escala de medición

Resumen

El objetivo fue desarrollar y validar una escala de medición de la propensión al emprendimiento y sus antecedentes (EMPEA). La base teórica se refiere a la propensión emprendedora y las características individuales previas (comportamiento innovador, necesidad de autonomía, necesidad de logro, proactividad, autoeficacia, locus de control interno/externo, tolerancia/intolerancia a la ambigüedad, propensión al riesgo y aversión al riesgo). Los procedimientos metodológicos son un estudio mixto, utilizando enfoques cualitativos (selección de características individuales y elaboración de ítems) y cuantitativos, a través del análisis multivariado de datos. Los resultados revelan que todos los constructos cumplen con los parámetros necesarios para realizar el análisis factorial exploratorio (AFE). Después de la reducción, todos mostraron una buena confiabilidad con un alfa de Cronbach superior a 0,70, lo que indica que todas los constructos EMPEA son estadísticamente confiables. En la versión final quedaron 56 ítems –9 de propensión al emprendimiento y 47 de características individuales–. La elaboración de ítems para medir la propensión al emprendimiento, así como la identificación de un conjunto de características individuales que la preceden, amplía la comprensión de este tema, ya que varios estudios no lo han medido como constructo, lo cual es el principal aporte del presente estudio. Considerando que el AFE es una técnica de interdependencia en la que se forman factores para mostrar el poder explicativo de un conjunto de variables, no permitiendo que uno o más factores sean considerados predictores de otro factor, las futuras investigaciones podrían realizar un análisis factorial confirmatorio proponiendo un modelo de cómo estas características individuales precedentes pueden estar directa o indirectamente relacionadas con la propensión emprendedora.

Palabras clave: Desarrollo y validación. Escala. Propensión al emprendimiento.

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INTRODUCTION

Opening new companies generates jobs, increases market competitiveness, improves the forms of production, and provides innovations, contributing to economic development (Ferreira & Freitas, 2013). One aspect of the research on entrepreneurship analyzes the intention to commence with the entrepreneurial behavior itself (Paiva, Lima, Rebouças, Ferreira, & Fontenele, 2018). However, little has been studied regarding the existence of a predisposition to initiate beyond the intention. Studies on this predisposition are essential, as several potential entrepreneurs have not yet started their businesses and do not openly display the intention of such behavior (Brazeal, 1993; Koe, 2016) but may in the future. The propensity to entrepreneurship is a favorable predisposition of the subject to start a new business (Chelariu, Brashear, Osmonbekov, & Zait, 2008).

There are divergences in some studies that have proposed to analyze the predisposition to undertake. For example, Asoh, Rivers, McCleary, and Sarvela (2005) define the propensity to entrepreneurship as the degree to which an individual or group of individuals is inclined, determined, and supported to become an entrepreneur or already to be acting as one, that is, they include current entrepreneurs in the definition, extrapolating the idea of the antecedent of entrepreneurial intention. Phan, Wong, and Wang (2002) studied the propensity to create new ventures for undergraduate students, measured with respect to the time imagined until starting the business and the interest in starting a business. Thus, they measured the intention to embark and not the propensity. Ferreira and Freitas (2013) sought to identify whether participation in activities of Junior Companies contributes to students' entrepreneurial propensity. However, in the questionnaire, they measured the students' probability to open a business, that is, if they intended to undertake. Paiva et al. (2018) measured the entrepreneurial intention, based on an individual's predisposition to open a business in the next five years and not in what precedes the intention, as is the case of propensity to entrepreneurship and its antecedents.

As for operationalization, different individual characteristics are considered dimensions that comprise the propensity to entrepreneurship. Caird (1988), in the general measure for Enterprising Tendency, assessed entrepreneurial potential through five dimensions: need for achievement, need for autonomy, creativity, risk-taking, and locus of internal control. The Entrepreneurial Predisposition Questionnaire developed by Koh (1996) aimed to measure the predisposition for entrepreneurship in three dimensions: risk-taking/unconventionality, need for achievement, and confidence in their skills, also showing a multifactorial structure. In the same direction, Bolton and Lane (2012) sought to identify future entrepreneurs, understood as Individual Entrepreneurial Orientation, using only antecedent individual characteristics to define these individuals, without measuring the construct itself. Barbosa (2012) measured it through three dimensions: proactivity, risk aversion, and capacity for innovation, suggesting that the propensity to entrepreneurship consists of a multifactorial structure for your antecedents.

Some studies consider this construct as unifactorial (Keat, Selvarajah, & Meyer, 2011; Mustapha & Selvaraju, 2015; Srivastava, 2008) and, consequently, a theoretical construction of its own that needs items to measure it, a view with which the present study shares, measuring by antecedent constructs of the propensity to entrepreneurship. Therefore, it is based on the perspective that the propensity to entrepreneurship is unifactorial and that some dimensions identified in previous research, such as proactivity, risk propensity, risk aversion, and innovation, are the antecedent individual characteristics of the propensity to entrepreneurship. In addition to these three antecedents, other individual characteristics are illustrated in the literature as directly or indirectly related to the propensity to entrepreneurship. Thus, identifying a set of individual antecedent characteristics and developing an instrument to measure the propensity to entrepreneurship can contribute to the field of scientific knowledge of entrepreneurship (Martínez-Campo, 2010; Van Ness & Seifert, 2016).

There is a need for new research to better understand the tendency to entrepreneurship construct and, mainly, to clarify the divergences existing in its operationalization. Based on these reflections, the question that guides this study is: What is the structure that comprises the Scale of Propensity to Entrepreneurship and its antecedents? To this end, we developed and tested a scale to measure the propensity to entrepreneurship as a construct and the individual characteristics preceding it. So, the study's objective is to develop and validate a Measurement Scale for Entrepreneurship and its Antecedents (MSPEA).

The focus of this study centers on identifying internal factors because despite considering the relevance of external factors, there are still doubts about how individuals inserted in the same cultural, economic, and social context differ in their propensity to create new businesses (Belás, Dvorský, Tyll, & Zvaríková, 2017). The fact that when recognizing a business

opportunity, some individuals choose to create a business to exploit it, while others choose not to embark, raises the question regarding the possibility of having a set of individual characteristics that can affect this decision (Caird, 1988; Van Ness & Seifert, 2016).

In addition to the propensity to entrepreneurship, three other theoretical constructions (nomenclatures) were identified that also refer to the predisposition to undertake, which are: Inclination for Entrepreneurship, Individual Entrepreneurial Orientation, and Tendency for Entrepreneurship. After an in-depth study of several researches with these nomenclatures, it was found that they have similarities since most of them address the predisposition scope. Furthermore, it was observed that when presented, the definitions partially reflect who is an individual prone to endeavor. Given this finding, eliciting inspiration from the studies by Brazeal (1993), Chelariu et al. (2008), and Khanduja and Kaushik (2009), the following definition is proposed: Propensity to Entrepreneurship refers to an individual's favorable predisposition to create new ventures, without necessarily considering future adversities, reflecting a favorable feeling that is not yet the intention to undertake, but may become in the future.

ANTECEDENTS' CHARACTERISTICS OF THE PROPENSITY TO ENTREPRENEURSHIP

The propensity to entrepreneurship consists of a person's favorable inclination to create new businesses (Chelariu et al., 2008). It can also be understood as the innate desire to create a business, without considering future adversities (Khanduja & Kaushik, 2009). The propensity to entrepreneurship refers to a predisposition of the individual that precedes the decision to start a business. However, different individual characteristics can relate positively or negatively and, directly or indirectly, with the propensity to entrepreneurship.

Several individual characteristics in the literature are considered antecedents of the propensity to entrepreneurship. From the review, we selected eleven characteristics, among which, two are the most recurrent in studies on this theme and the direct relationship of which has been observed in most of them (innovative behavior and risk propensity). The others, even with divergent results, have proven relevant to its relationship with propensity to entrepreneurship (need for achievement, need for autonomy, self-efficacy, proactivity, locus of internal/external control, and tolerance/intolerance to ambiguity). Additionally, we considered it relevant to analyze risk aversion to understand the risk perspective more comprehensively, complementing the risk propensity.

Innovation can be defined in different ways (Goldsmith & Foxall, 2003), referring to the willingness to change (Hurt, Joseph, & Cook, 1977), the process of creating something new (both ideas and practices), generation, and implementation of new ideas (Scott & Bruce, 1994), and behavioral repertoire and cognitive state of an individual characteristic that influences behavior (Goldsmith & Foxall, 2003). The individual innovation process begins with identifying a problem and creating a solution, whether new or previously used. Then, an innovative subject seeks to disseminate and obtain support for the idea and, finally, implement the solution (Scott & Bruce, 1994). Lukes and Stephan (2017) indicate that innovative behavior refers to actions strategized to generate ideas and their subsequent implementation.

Menold, Jablokow, Purzer, Ferguson, and Ohland (2014) propose that innovation is a general aspect of the personality and can be understood as the acceptance of novelties (Goldsmith & Foxall, 2003). Individuals with this individual characteristic tend to get involved in their own companies, looking for ways to change and improve activities (Leavitt & Walton, 1975). Innovation is part of the propensity to entrepreneurship and promotes the creation of ideas that can become new ventures (Menold et al., 2014; Solhi & Koshkaki, 2016).

Autonomy consists of a subject's desire and ability to be self-directed toward the search for opportunities (Lumpkin & Dess, 1996). It refers to the need to feel free and to act with a sense of ownership (Deci & Ryan, 2000). This is not a need to act independently of other people's desires, but to act according to a sense of self-will and choice, even if it is acting according to the wishes of others (Van den Broeck, Ferris, Chang, & Rosen, 2016). Furthermore, being autonomous is not equivalent to being independent, not trusting, or separating yourself from others; it may include acting according to the will of others or endorsing someone's actions, if it is consistent with the integrated sense of their own will (Deci & Ryan, 2000).

Autonomy is a critical aspect of entrepreneurship (Chelariu et al., 2008; Lumpkin & Dess, 1996). Entrepreneurship demands the individual's ability to act independently to idealize and implement a business. More entrepreneurial companies have more autonomous leaders (Shrivastava & Grant, 1985). Employees with a greater desire for autonomy are more likely to feel dissatisfied if their jobs do not allow decision-making and, therefore, wish to create their own ventures (Chelariu et al., 2008).

Need for Achievement refers to a concept developed by McClelland (1965), representing the desire to stand out, perform in relation to a set of standards, and fight for success (Rishipal, 2012). It is also called motivation for achievement, as it is a motivational and non-cognitive concept. The motivation for achievement is an observable behavior of striving to succeed and employing all your skills so that you can be recognized for that success. It is considered a relatively stable personality trait (McClelland, 1965).

The high need for achievement predisposes the individual to a business position in which he can obtain satisfaction not otherwise obtained in other occupations (McClelland, 1965). As highlighted by Chen, Su, and Wu (2012), when an individual's needs are not met, he is motivated to behave to satisfy them and the need for fulfillment corresponds to the individual's internal desire for success. Entrepreneurs may have a greater need to realize and succeed, as a result, creating their businesses may be the alternative identified for this. When unsatisfied, the need for achievement drives business persistence to obtain the achievements entrepreneurs desire (Wu, Matthews, & Dagher, 2007).

Proactivity refers to an individual's ability and willingness to take actions to change a situation to his advantage (Kirby, Kirby, & Lewis, 2002), and proactive behavior can be understood as a relatively stable tendency to effect changes in the environment (Bateman & Crant, 1993). It encompasses initiatives to produce changes in the environment or in itself with a view to a different future (Parker, Bindl, & Strauss, 2010). This includes attempts to change current situations or create new circumstances (Gupta & Bhawe, 2007).

People with proactive behavior accumulate resources, mobilize them when necessary, and use strategies to prevent their depletion. People with proactive personalities believe that they can affect the world around them (Kirby et al., 2002). Entrepreneurship involves working with unexpected challenges and difficulties in a changing environment, and individuals with proactive personalities may be more likely to undertake (Crant, 1996; Gupta & Bhawe, 2007). Proactive people tend to have a greater need for autonomy, which makes it easier for them to exert greater influence over the context, so they have greater intentions to start a business instead of working for other people (Gupta & Bhawe, 2007).

Self-efficacy is understood as an individual's belief in his ability to develop an action that produces the desired effects, that is, it is when the subject believes in his ability to satisfactorily develop an activity (Barros & Batista-dos-Santos, 2010). Self-efficacy interferes with the choice of activities, how much effort will be invested in it, the degree of persistence when facing obstacles, the expected results, and the causes that the individual will attribute to failure or success (Bandura, 2012). Individuals may have low or high levels of self-efficacy according to their beliefs regarding their own abilities (Barros & Batista-dos-Santos, 2010). The greater the self-efficacy perceived by the individual, the greater the efforts to face adversity.

Self-efficacy is essential for entrepreneurship, as believing in one's own ability to face uncertain situations is crucial for the creation and survival of an enterprise (Chaudhary, 2017; Wardana et al., 2020). People with high self-efficacy discover ways to overcome obstacles, while those with low self-efficacy tend to consider their efforts useless when faced with difficulties (Bandura, 2012).

Locus of Internal/External Control refers to the individuals' beliefs about what controls their behavior (Abbad & Meneses, 2004; Collins, 1974; Levenson, 1973; Rotter, 1966), which portrays how much control the individual believes they have over their destiny (Levenson, 1973; Maciel & Camargo, 2010). This construct is treated as a continuum, and, at one extreme, the person understands that control depends on his efforts and capabilities. At the other extreme, control is perceived as dependent on aspects outside his control, like other people or entities such as chance, fate, or luck (Dela Coleta, 1979; Rotter, 1966). In other words, individuals are located along this continuum of locus of control that varies from internality or internal control to externality or external control (Dela Coleta, 1987; Rotter, 1966). Individuals who have an internal locus of control tend to believe that they control the events of their life, while those who exhibit an external locus of control believe that they have little control over the events of their life, as they are defined by external environmental factors (Chaudhary, 2017; Rotter, 1966).

The locus of control is a relevant characteristic in the prediction, control, and modification of human behavior (Dela Coleta, 1979; Levenson, 1973; Rotter, 1966). In this sense, studies indicate that internality encourages people to define and pursue their goals in the short and long terms. In this context, entrepreneurs are expected to have a greater locus of internal control, as they will believe that they have control over a series of events in their lives (Levenson, 1973; Rotter, 1966). In entrepreneurship, individuals believe their dedication can generate a viable enterprise even in the face of factors over which they have no control. The locus of control is one of the traits that showed significance in differentiating between entrepreneurs and non-entrepreneurs (Chaudhary, 2017).

A situation is considered ambiguous when there is not enough information for an individual to properly categorize and structure it. Tolerance of ambiguity consists of how an individual (or group) perceives and processes information regarding ambiguous situations or stimuli when confronted with a series of unknown, complex, or incongruous clues. It can also be defined as an inclination to consider ambiguous situations desirable. Intolerance to Ambiguity consists of a tendency to perceive or interpret information marked by vague, incomplete, fragmented, multiple, probable, unstructured, uncertain, inconsistent, contrary, contradictory, or unclear meanings as real or potential sources, discomfort, or a psychological threat (Norton, 1975). Individuals with intolerance to ambiguity tend to behave more conservatively than those with tolerance to ambiguity (Budner, 1962).

While an individual with ambiguity intolerance tends to avoid ambiguous situations, one with an ambiguity tolerance evaluates these situations as interesting, challenging, and desirable (Chaudhary, 2017). Individuals with a high tolerance for ambiguity seek challenging situations and strive to overcome unpredictable and unstable situations (Koh, 1996). Conversely, ambiguous intolerants tend to be more conventional (Budner, 1962). In entrepreneurship, this tends to be a relevant characteristic when considering the uncertainties present in the environment (Chaudhary, 2017).

Risk Aversion is defined as the degree of an individual's negative attitude towards risk due to the uncertainty of results (Mandrik & Bao, 2005). Risk propensity demonstrates the inclination of the individual in taking risks by engaging in activities whose results are uncertain (Sitkin & Weingart, 1995), positively influencing risk-taking behavior. Risk propensity is considered an individual characteristic, which is why research usually emphasizes personality characteristics of those prone to risk, such as self-control, impulsivity, aggressiveness, and the search for a sense of danger (Howat-Rodrigues, Andrade, & Tokumaru, 2013).

Entrepreneurs need to make decisions without having all the necessary information, thus, it becomes impossible to assess all the risks involved. In these situations, risk propensity and aversion can play a fundamental role in the decision taken by entrepreneurs: a risk-averse decision maker tends to focus on the possible negative results, while a risk-prone one will perceive the possible advantages (Wang, Zhang, & Wang, 2015). Risk propensity can affect the decision to undertake since the necessary investments result in risks given the possibility of financial losses and emotional consequences (Brockhaus, 1980).

In summary, the theoretical foundation brought important theoretical evidence that supported the development and validation of a scale to measure the propensity to entrepreneurship and its antecedents. The following is how we developed the research.

METHODOLOGICAL PROCEDURES

To achieve the objective of this study, we followed the steps suggested by DeVellis (2016).

Procedures adopted in the construction of MSPEA

We sought to balance the number of items in each construct of an antecedent characteristic of the propensity to entrepreneurship and to incorporate reverse items into each. In addition, the literature used addressed a similar number of items for each construct. We measured the locus of control, ambiguity, and risk constructs at opposite poles.

We initially prepared 224 items, and to refine the quantity, five specialists evaluated these items as to their relevance for measuring each construct and the item's clarity and objectivity. After this modification, 97 items were considered appropriate to compose the Scale of Propensity to Entrepreneurship and its Antecedents, distributed as follows: Propensity

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to entrepreneurship (17), Innovative behavior (8), Need for autonomy (8), Need for achievement (8), Proactivity (8), Self-efficacy (8), Locus of control (Internal 7), Locus of control (External 6), Ambiguity (Tolerance 6), Ambiguity (Intolerance 7), Risk (Propensity 7), and Risk (Aversion 7).

We performed a semantic validation for these items, and in this process, we followed the procedures indicated by Pasquali (2003). This process constituted asking a group of 10 students to critically read the items and evaluate whether they were comprehensible on a 5-point Likert scale, ranging from totally incomprehensible to totally understandable. Based on the answers, we decided to keep the 97 items, but it was necessary to modify the wording of five of them.

The 5-point Likert scale (1 - Strongly disagree to 5 - Strongly agree) proved appropriate for developing MSPEA. We performed a content validation, which consists of the subjective and systematic evaluation of the content of a scale to verify whether the items measure what is intended (Pasquali, 2009). The group of judges (2 specialists in the field of entrepreneurship, 2 in psychology, and 2 in statistics), evaluated the items on the scale, following Pasquali's (1999) suggestions that the level of agreement, the adequacy of the item to the construct, and the clarity of the statement of the statement was at least 80%.

The agreement analysis (Content Validity Index - CVI), for each item in the Propensity to Entrepreneurship construct, indicated that of the 17 items, 13 items showed almost perfect agreement (indexes greater than 80%), and should remain on the scale to be empirically tested and four items showed substantial agreement (between 60 and 80%), which we excluded from the scale. We performed this same procedure in all the preceding constructs of the propensity to entrepreneurship, keeping only those with almost perfect agreement (rates greater than 80%). This process excluded 5 more items, leaving 88 items whose CVIs of the constructs were: Propensity to entrepreneurship (0.89, 13 items), Innovative behavior (0.90, 7 items), Need for autonomy (0.94, 7 items), Need for achievement (0.90, 7 items), Proactivity (0.94, 8 items), Self-efficacy (0.92, 7 items), Internal control locus (0.93, 7 items), External control locus (0.90, 6 items), Ambiguity tolerance (0.90, 6 items), Ambiguity intolerance (0.91, 7 items), Risk propensity (0.94, 6 items), and Risk aversion (0.93, 7 items).

Procedures adopted in the MSPEA pre-test

We pre-tested the instrument concurrently with the stage of validation of official content by the group of experts. The pre-test is critical for developing and validating scales as it reduces possible errors in forming the questionnaire, minimizing future problems and verifying whether the instrument is capable of measuring what it proposes (Hair, Black, Babin, Anderson, & Tatham, 2009). The instrument applied in the pre-test, in a sample of 164 freshman students in the Business Administration course, was the same that the experts evaluated, which contained 97 items. The recommendation is to perform a factor analysis to previously analyze the items (DeVellis, 2016).

We used the SPSS (Statistical Package of Social Science), having as a starting point the objectives outlined a priori for the development of the scale. Initially, we analyzed the missing values (non-responses), with 9 participants eliminated for leaving items blank. We performed the pre-test of the Exploratory Factor Analysis (EFA). As for the verification of the assumptions for the application of the EFA, two indicators were initially analyzed: KMO (Kaiser-Meyer-Olkin) general and Bartlett's Sphericity Test (Hair et al., 2009).

All constructs proved suitable for performing EFA since the general KMO was greater than 0.70 and Bartlett's sphericity test was .000 in all constructs. Then, in the antiimage matrix, the patterns of relationships were analyzed to check for the existence of items that should be eliminated as they do not correlate within their construct (Hair et al., 2009). After this stage, items whose values on the main diagonal were high and outside the main diagonal were limited and remained in each construct. Since the objective of the pre-test was more to verify the adequacy of the scale developed for performing EFA than to reduce the number of items, the individual commonalities of the items were not analyzed.

Considering that a one-dimensional structure was desirable for the Propensity to Entrepreneurship, Innovative behavior, Need for autonomy, Need for achievement, Proactivity, and Self-efficacy and, two-dimensional for Locus of control (internal/external), Ambiguity (tolerance/intolerance), Risk propensity, and Risk aversion, we analyzed the rotated matrix of each construct. This step would eliminate the items that presented cross load and those that were left alone in one factor. Only items with a factor load greater than 0.50 were maintained (Hair et al., 2009). After these analyses, 84 items remained to form the instrument.

To verify the reliability of the scale, we used Cronbach's alpha, and for the convergent validity, the Average Extracted Variance (AVE). All constructs showed Cronbach's alpha greater than 0.70, demonstrating the scale is reliable and with internal consistency. Although the variance extracted from some constructs was less than 0.50 (Hair et al., 2009), we decided not to eliminate more items and to test them in the definitive application of the scale.

We compared the items that should be eliminated through the analysis performed in the pre-test and the results of the content validity produced by specialists. The analyses indicated differences in 3 items of the propensity to entrepreneurship construct, one of innovative behavior, one of the need for autonomy, one of proactivity, one of the locus of internal control, one of the locus of external control, one of the ambiguity intolerance, and one of risk propensity. To resolve these divergences, we carefully analyzed the items, and decided to keep those items that met the criteria of 80% agreement in the CVI. Thus, four items excluded in the EFA remained on the scale, which was left with 88 items.

Participants and procedures adopted in MSPEA validation

The participants were undergraduate students in Business Administration in public education institutions in the State of Paraná – Brazil. These participants are valid samples for studies on future entrepreneurs, as they generally have not yet entered or established themselves in the business world (Bolton & Lane, 2012). We collected 3,691 responses, of which we excluded 467 as they contained blank items. To draw the participants from each sample, we used the function "= Random Between (1; 3)" in excel, with 766 participants selected for the EFA.

After content validation and pre-test, the data collection instrument is the Entrepreneurship Propensity Scale, which contained 88 items. EFA followed the procedures proposed by Hair et al. (2009), evaluating: KMO (above 0.7), Bartlett's Sphericity test (<0.05), KMO of each variable in the anti-image (above 0.5), and then adjusting the model with the exclusion of variables with commonality below 0.5, as well as variables with crossed loads (above 0.5 in more than one factor), load factorial less than 0.60. In the rotated matrix, the factor loads were analyzed. The extraction method was of main components and the rotation factor was Varimax.

The patterns of relationships were analyzed in the Anti-Image Correlation Matrix, to check for the existence of items that should be eliminated as they do not correlate within their construct. In this analysis, the minimum acceptable value for each item is 0.50 (it is preferable that they be higher).

ANALYSIS OF RESULTS

Suitability of items for exploratory factor analysis

We analyzed the adequacy of the data for performing EFA. For that, we followed the parameters suggested by Hair et al. (2009), evaluating: general KMO (above 0.7) and Bartlett's Sphericity test (<0.05). The method of extraction was of main components and the factor rotation was Varimax, one of the most used methods, which Hair et al. (2009) considers superior to other orthogonal factorial rotation methods when trying to achieve a simplified factorial structure.

The initial tests of general KMO, total construct variance and Bartlett's sphericity verified the suitability of MSPEA, for the performance of the EFA (Table 1).

Table 1
KMO values, explained variance and Bartlett's sphericity test

Construct	KMO	Total Variance	Bartlett
Propensity to Entrepreneurship - (PE)	.944	53.05%	.00
Innovative behavior- (InnovB)	.863	51.50%	.00
Need for autonomy- (Naut)	.847	44.21%	.00
Need for achievement- (Nach)	.827	45.74%	.00
Proativity- (Proa)	.890	51.66%	.00
Self-efficacy- (Eff)	.866	49.20%	.00
Internal locus of control- (LocInt)	.848	51.53%	.00
External locus of control- (LocExt)	.815	54.70%	.00
Ambiguity tolerance- (AmbTo)	.789	44.36%	.00
Ambiguity intolerance- (AmbInt)	.807	67.27%	.00
Risk propensity- (Ris_Pro)	.859	62.21%	.00
Risk aversion- (Ris_Ave)	.894	56.02%	.00

Source: Research data.

Considering that the initial tests met the parameters suggested by the literature, the next step was to reduce the scale items. It was necessary to analyze the KMO of each variable in the anti-image matrix (above 0.5), exclude variables with commonality below of 0.5 and, based on the rotating matrix, analyze the factorial loads to exclude those with a cross load (above 0.5 in more than one factor) and those with a low factor load (less than 0.60).

Exploratory factor analysis

The scale reduction process started, and we achieved the reduction item by item. and after each exclusion, we ran the EFA again. The items were excluded due to their commonalities below 0.50 (Table 2).

Table 2
Deleted items

Construct	Deleted items
Propensity to entrepreneurship	PE4, PE9, PE11 and PE10_r
Innovative behavior	InnovB5 and InnovB7
Need for autonomy	Naut1, Naut2, Naut3 and Naut7
Need for achievement	Nach5, Nach6 and Nach7
Proactivity	Proa2, Proa3 and Proa4
Self-efficacy	Eff1, Eff2 and Eff4
Internal locus of control	LocInt1, LocInt2 and LocInt3
External locus of control	LocExt1 and LocExt2
Ambiguity tolerance	AmbTo1, AmbTo2 and AmbTo3
Risk aversion	Ris_Ave3
Ambiguity intolerance	AmbInto2

Source: Research data.

We also excluded Intolerance to ambiguity item AmbInto and in Risk propensity, item Ris_Pro5, because they form different dimensions from the other items of the factor. After the exclusions, 56 items remained, whose KMO values and the total variance explained for each construct (Table 3).

Table 3
KMO values, explained variance and Bartlett's test after exclusion

Construct	KMO	Total Variance	Bartlett
Propensity to entrepreneurship (PE)	.928	61.32%	.00
Innovative behavior (InnovB)	.852	61.94%	.00
Need for autonomy (Naut)	.765	65.31%	.00
Need for achievement (Nach)	.728	60.44%	.00
Proactivity (Proa)	.742	62.12%	.00
Self-efficacy (Eff)	.760	58.77%	.00
Internal locus of control (LocInt)	.744	61.32%	.00
External locus of control (LocExt)	.759	70.55%	.00
Ambiguity tolerance – (AmbTo)	.747	64.42%	.00
Ambiguity intolerance- (AmbInto)	.830	59.33%	.00
Risk propoensity- (Ris_Pro)	.851	66.46%	.00
Risk aversion- (Ris_Ave)	.878	60.61%	.00

Source: Research data.

Although the constructs Self-efficacy and intolerance to ambiguity did not reach 0.60 of explained variance, these values were close. Furthermore, in the case of one-dimensional constructs, the variance can be 0.50. Thus, considering that all factorial loads were already greater than 0.60 and commonalities greater than 0.50, we decided not to exclude more items. A new general EFA was run with all the final items of each construct to check if they discriminated against each other. In this analysis, the initial parameters were adequate with a general KMO of 0.921, Bartlett's .000 and a variance of 62.69% (Table 4).

Table 4
Factors obtained in the exploratory factor analysis

Items	Factor 1 Propensity to Entrepreneurship	Factor 2 Propensity/Risk Aversion	Factor 3 Innovative Behavior	Factor 4 Ambiguity Intolerance	Factor 5 External control locus	Factor 6 Internal control locus	Factor 7 Self-efficiency	Factor 8 Proactivity	Factor 9 Need for Achievement	Factor 10 Ambiguity Tolerance	Factor 11 Need for autonomy
PE1	.839										
PE5	.823										
PE13	.800										
PE2	.793										
PE12	.751										
PE7	.729										
PE3	.667										
PE8	.648										
PE6	.643										
Ris_Ave4		-.773									
Ris_Ave1		-.740									

Continue

Items	Factor 1 Propensity to Entrepreneurship	Factor 2 Propensity/Risk Aversion	Factor 3 Innovative Behavior	Factor 4 Ambiguity Intolerance	Factor 5 External control locus	Factor 6 Internal control locus	Factor 7 Self-efficiency	Factor 8 Proactivity	Factor 9 Need for Achievement	Factor 10 Ambiguity Tolerance	Factor 11 Need for autonomy
Ris_Ave5		-.722									
Ris_Pro2		.694									
Ris_Pro3		.691									
Ris_Ave7		-.657									
Ris_Pro4		.628									
Ris_Pro6		.620									
Ris_Pro1		.593									
Ris_Ave2		-.568									
Ris_Ave6		-.563									
InnovB4			.767								
InnovB3			.757								
InnovB1			.742								
InnovB2			.731								
InnovB6			.611								
AmbInt4				.774							
AmbInt6				.770							
AmbInt3				.755							
AmbInt5				.741							
AmbInt7				.671							
LocExt4					.847						
LocExt5					.828						
LocExt6					.807						
LocExt3					.794						
LocInt6						.839					
LocInt5						.768					
LocInt4						.718					
LocInt7						.673					
Eff4							.715				
Eff6							.686				
Eff3							.684				
Eff5							.668				
Proa7								.716			
Proa6								.697			
Proa5								.656			
Proa8								.592			

Continue

Items	Factor 1 Propensity to Entrepreneurship	Factor 2 Propensity/Risk Aversion	Factor 3 Innovative Behavior	Factor 4 Ambiguity Intolerance	Factor 5 External control locus	Factor 6 Internal control locus	Factor 7 Self-efficiency	Factor 8 Proactivity	Factor 9 Need for Achievement	Factor 10 Ambiguity Tolerance	Factor 11 Need for autonomy
Nach2									.696		
Nach1									.675		
Nach4									.648		
Nach3									.630		
AmbTo4										.722	
AmbTo6										.717	
AmbTo5										.680	
Naut5											.809
Naut6											.778
Naut4											.757

Source: Research data.

The results pointed out eleven factors, while twelve were expected to emerge. However, the "Risk" factor grouped both propensity and aversion items, but the factorial loads of risk aversion items are negative, indicating that they measure the opposite of what propensity measures, therefore, they reflect what was sought to be measured. Although one item of the risk-prone construct and two of the risk-aversion constructs had a factor load of less than 0.60, we decided not to exclude any item, as the values were very close to the required level and in the assessment of these constructs individually, loads were greater than 0.60.

To finalize reducing the scale, we also sought to verify the reliability of the constructs through the analysis of Cronbach's alpha (Table 5).

Table 5
Dimensionality, convergent validity, and Cronbach's alpha of the constructs

Construct	Convergent validity	Items	Reliability
	% Variance		Cronbach's Alpha
Propensity to Entrepreneurship- (PE)	61.32%	9	.916
Innovative Behavior- (InnovB)	61.94%	5	.846
Need for Autonomy- (Naut)	65.31%	3	.734
Need for Achievement- (Nach)	60.44%	4	.780
Proativity- (Proa)	62.12%	4	.791
Self-efficacy- (Eff)	58.77%	4	.764
Internal locus of control- (LocInt)	61.32%	4	.779
External locus of control- (LocExt)	70.55%	4	.860
Ambiguity Tolerance- (AmbTo)	64.42%	3	.723
Ambiguity intolerance- (AmbInt)	59.33%	5	.828
Risk Propensity- (Ris_Pro)	66.46%	5	.874
Risk Aversion- (Ris_Ave)	60.63%	6	.867

Source: Research data.

The analysis of Cronbach's alpha shows that all constructs have good reliability. As for the risk-prone construct item "Ris_Pro1", we observed that, if it was excluded, the alpha would remain adequate (0.863), and the risk aversion items, "Ris_Ave2" and "Ris_Ave6", would also not affect reliability, because, with its exclusion, the alpha would be 0.851 and 0.863.

CONCLUSIONS, CONTRIBUTIONS, AND FUTURE RESEARCH

Faced with gaps in the literature in the field of knowledge of the propensity to entrepreneurship, the objective of the study was to develop and validate a Measurement Scale of the Propensity to Entrepreneurship and its Antecedents (MSPEA). The purpose was to develop the items to compose the scale (224 items), and after the experts' evaluation and semantic validation, leaving 97 items. We conducted the quantitative stage by performing the pre-test (in which 88 items remained). Finally, after all the criteria were established for the scale items, we tested the scale in a sample composed of 766 participants (56 items).

Some instruments measure the Propensity to Entrepreneurship only through individual antecedent characteristics and not as a theoretical construction in itself. However, our results showed that it can be operationalized through 9 items: PE1 "Having a business of my own can be an option for me in the future", PE2 "I think that starting a business of my own is an excellent opportunity for my personal success", PE3 "I would be able to take the necessary risks to start my own business", PE5 "Even though I am currently working for others, I believe that one day I can have my own business", PE6 "I have already thought about entrepreneurship as a career option", PE7 "If I had the opportunity, I would rather work on my own than be an employee", PE8 "I prefer variable compensation in my own business rather than a fixed salary as an employee", PE12 "If I try hard enough, I believe I can have my own business in the future", and PE13 "I believe I can create my own business in the future".

This study proposes that the propensity to entrepreneurship is a theoretical construction that can be measured and that eleven individual characteristics can be its antecedents. The antecedents are in two distinct groups in which eight can be considered positive, which are: innovative behavior, need for autonomy, need for achievement, proactivity, self-efficacy, locus of internal control, tolerance to ambiguity, and risk propensity, and three of these characteristics can be understood as negative, namely: locus of external control, intolerance to ambiguity, and risk aversion. We found that all the proposed constructs presented good reliability, signaling that both the construct prone to entrepreneurship and those of the characteristics proposed here are statistically reliable.

Creating specific items to measure the propensity to entrepreneurship, as well as identifying a set of individual characteristics prior to it, expands the understanding of this theme, since several studies did not measure it as a construct, but through individual characteristics which are actually antecedents to it. Thus, in developing the scale, it is not possible to infer which of these antecedent characteristics may predict the propensity to entrepreneurship. This information opens space for future research to propose models of direct or indirect relationships with the propensity to entrepreneurship, in which the individual antecedent characteristics will be independent variables and the dependent one will be the propensity to entrepreneurship. Further exploration of Confirmatory Factor Analysis, by testing the direct and indirect relationships between the individual antecedent characteristics proposed in the present and the propensity to entrepreneurship, may clarify some divergent results found in the current literature.

The results of this research generated the development and evaluation of a scale of propensity to entrepreneurship, and when developing it, it also brings theoretical and practical contributions. By bringing together and integrating constructs and elements of psychology to support the development of the scale, this study has important theoretical implications for the literature. It is an unprecedented scale, developed with rigor and with a sample. The interface of areas that complement each other and expand the knowledge of the area opens perspectives for new studies. Regarding the practical implications, this scale can be applied in programs or courses that enable entrepreneurs to contribute to an assessment of the propensity to entrepreneurship and to illuminate the pretensions or not of those who may become entrepreneurs.

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