



Passion and perseverance as two new dimensions of an Individual Entrepreneurial Orientation scale

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ABSTRACT

This study sought to validate a scale for quantitative research on two emerging dimensions of individual entrepreneurial orientation (IEO): passion and perseverance. The proposed measurement instrument was developed, validated and tested using data on 249 agri-food firms created in the last five years in a Portuguese region. The final analysis of the IEO dimensions and corresponding items used confirmatory factor analysis, resulting in an adjusted, reliable multidimensional model. The latter comprised the three core dimensions of IEO—risk taking, innovativeness and proactivity—and the additional dimensions of passion and perseverance. This study is of interest to those who deem conducting research at different analytical levels important since the results explicitly explain the interaction between IEO and the underexplored concepts of entrepreneurial passion and perseverance. The findings show that these individual characteristics have implications for entrepreneurs as all five dimensions influence firm management through entrepreneurial orientation.

1. Introduction

Entrepreneurial orientation (EO) was originally conceived by Miller (1983) and later operationalised by Covin and Slevin (1989) and expanded by Lumpkin and Dess (1996). This concept has emerged as a rigorous, robust scientific construct based on a stable body of cumulative knowledge developed in the field of management (Basso, Fayolle, & Bouchard, 2009). EO can refer to both organisations and individuals and be an important feature of new or existing enterprises (Ferreira, Jalali, Bento, Marques, & Ferreira, 2016).

Given this concept's broad applicability, researchers have sought to distinguish more clearly between organisational EO and individual entrepreneurial orientation (IEO) (e.g. Adomako, Howard, & Narteh, 2016; Anderson, Kreiser, Kuratko, Hornsby, & Eshima, 2015; Bolton & Lane, 2012; Ferreira et al., 2016; Kollmann, Christofor, & Kuckertz, 2007; Kraus, Breier, Jones, & Hughes, 2019; Pittino, Visintin, & Lauto, 2017; Santos, Marques, & Ferreira, 2018; Wiklund & Shepherd, 2005). Thus, EO has emerged as a prominent construct in the literature on organisational management, attracting much attention in academic journals (e.g. Covin, Green, & Slevin, 2006; Messersmith & Wales, 2013; Rauch, Wiklund, Lumpkin, & Frese, 2009) and books (e.g. Gupta & Dutta, 2018; Morris, Kuratko, & Covin, 2010). The EO concept is also

widely regarded as a key point in the literature on entrepreneurship (Wales, Gupta, & Mousa, 2013).

EO refers to a strategic organisational stance that captures the specific processes, practices and activities that enable organisations to create value by getting involved in business ventures (Lumpkin & Dess, 1996). In general, EO is considered to reflect a comprehensive perspective on business consisting of deeply rooted beliefs and values associated with proactive, risk-prone and innovative tendencies (Rauch et al., 2009). Based on Lumpkin and Dess (1996) work, Kollmann et al. (2007) refer to EO as characteristic of individuals rather than organisations, arguing that EO has five main facets. First, individuals struggling for a high degree of autonomy are more likely to act in entrepreneurial ways. Second, individuals' attitudes towards innovation determine their entrepreneurial behaviours, and, third, risk taking is likely to influence EO. Fourth, proactive individuals never cease to take advantage of business opportunities that may arise. Last, competitive aggressiveness is similar to the need for achievement (McClelland, 1961), which also influences EO.

In response to the challenge issued by Covin and Miller (2014), Gerschewski, Lindsay, and Rose (2016) carried out a qualitative study that identified two emerging dimensions, entrepreneurial passion and perseverance, which can be included as part of the IEO construct.

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Entrepreneurial passion is considered a set of intense positive feelings experienced when engaging in entrepreneurial activities associated with roles that entrepreneurs feel are meaningful (Cardon, Wincent, Singh, & Drnovsek, 2009). This passion can foster creativity and the adoption of new information standards critical to the discovery and exploitation of promising opportunities (Baron, 2008). Perseverance, in turn, is related to the continued pursuit of goals despite adversity (van Gelderen, 2012), ensuring actions and energy are directed towards the achievement of objectives even in the face of obstacles (Baum & Locke, 2004). Individuals react differently to similar adverse situations, so scholars have proposed that the ability to persevere may determine new ventures' success (Markman, Baron, & Balkin, 2005).

Over the last 40 years, the concept of EO has served as the basis for a stable but developing body of cumulative knowledge. However, research is still scarce at the level of individuals (i.e. IEO) (Bolton & Lane, 2012; Kollmann et al., 2007). In addition, few studies have applied an empirical approach or adopted a multi-dimensional view of EO, although the latter approach has been increasingly utilised in recent years (Chahal, Gupta, Lonial, & Raina, 2019; Popov, Varga, Jelić, & Dinić, 2019; Wales et al., 2013). Given these gaps, the present study sought to validate and operationalise a scale for quantitative IEO studies, including the emerging dimensions of passion and perseverance. The scale was developed for the agri-food sector, but this research can be replicated for other sectors of activity and contexts.

The proposed scale was based on Bolton and Lane (2012) IEO scale plus the two emerging dimensions. The proposed items that assessed the IEO dimension of entrepreneurial passion or, more simply, passion were based on a literature review mainly of Cardon et al. (2009) and Gerschewski et al. (2016) studies. The perseverance items were drawn primarily from Duckworth, Peterson, Matthews, and Kelly (2007) and Gerschewski et al. (2016) research. Thus, the present study's added value is the proposed scale items formulated to facilitate a quantitative evaluation of passion and perseverance as IEO constructs.

The following article is structured as follows. This first section serves as the introduction, in which the study's focus is presented. The second section details the theoretical framework of EO, IEO and new dimensions of IEO. Section three discusses the methodology, including the methods and tools used. The fourth section presents a characterisation of the sample and the results of the investigation, while section five discusses these results. The final section offers the main conclusions, as well as implications and suggestions for future research.

2. Literature review

2.1. Entrepreneurial orientation

The concept of EO owes its genesis to the pioneering studies conducted by Mintzberg (1973), Khandwalla (1972, 1976) and Miller (1983), who argue that firm performance is largely based on strategic choices, organisational attributes (e.g. structure) and environmental requirements. Miller (1983) crystallised the current understanding of an entrepreneurial approach to strategy creation, suggesting that entrepreneurial ventures are those that seek to innovate, aggressively enter new markets and accept strategic and financial risks in the search for new opportunities. The cited author postulates that entrepreneurial firms need to display all three strategic components to some degree simultaneously. Miller (1983) further notes that researchers cannot designate a given firm as an entrepreneurial venture if it only modifies its technology or product line by directly imitating competitors, thereby refusing to take risks, failing to show sufficient proactivity and neglecting to promote innovation.

Although Miller (1983) theoretical contributions are highlighted above, only after the publication of Covin and Slevin (1989) EO scale did the literature fully affirm empirical research on EO in terms of firm-level analysis (Wales et al., 2013). Covin and Slevin (1989) measurement instrument consists of a nine-item self-response scale, which has

been used in a large number of studies, thereby expanding research on EO within entrepreneurship (Rauch et al., 2009). The presence of an empirically robust instrument provided the necessary impetus for more studies applying Miller (1983) EO concept, which is currently the main body of existing EO research (Saha, Kumar, Dutta, & Dutta, 2017).

In the period that followed Covin and Slevin (1989) seminal work, researchers proposed alternative perspectives on the conceptual domains of firm-level EO (e.g. Lumpkin & Dess, 1996). For example, Lumpkin and Dess (1996) refer to EO-related processes, practices and decision-making that lead to new input, including risk taking, innovativeness, proactivity, autonomy and competitive aggressiveness. These are dimensions that precede the entry of new ventures into the market.

Two dominant perspectives currently exist within the EO literature. The first is a one-dimensional view of EO as comprising the elements of risk taking, innovativeness and proactiveness (Covin & Slevin, 1989). The second is a multidimensional conceptualisation in which risk taking, innovativeness, proactiveness, competitive aggressiveness and autonomy are independent EO dimensions (Lumpkin & Dess, 1996). The one-dimensional approach, namely, the unitary construct of EO (e.g. Covin & Slevin, 1989; Knight, 1997), refers to an organisational attribute that reflects how 'being an entrepreneur' manifests itself in organisations or business units. This approach conceives of EO as the simultaneous presence of risk taking, innovative and proactive trends, thereby considering it a construct that needs to be examined as a whole and not just as a collection of its parts (Gupta & Gupta, 2015).

In contrast, the multidimensional approach uses the label 'entrepreneur' when any one of the five EO elements is present (Hughes & Morgan, 2007). EO is conceptualised at the most fundamental level as entrepreneurship manifested as an organisational attribute (Gupta & Gupta, 2015) through the dimensions of risk taking, innovativeness, proactiveness, competitive aggressiveness and autonomy (Lumpkin & Dess, 1996). Polites, Roberts, and Thatcher (2012) designate this approach a 'profile construct'. That is, EO is represented by how the construct's dimensions are combined into a general profile. Thus, despite their common origins, Covin and Slevin (1989) holistic perspective and Lumpkin and Dess (1996) disaggregated view represent distinct and competing approaches to what is meant by 'entrepreneurial' (Covin & Wales, 2012, 2019).

These two predominant conceptions of EO appear to coexist in the literature, with each perspective providing unique insights (Covin & Lumpkin, 2011; Miller, 2011; Wales, 2016). Although researchers debate and disagree about the two perspectives' relative merits, the consensus in the academic literature is that future studies seeking to add new EO dimensions to the existing knowledge base should include Miller (1983) three core dimensions. In other words, taking risks and having a capacity for innovation and proactivity are essential EO dimensions, while autonomy and competitive aggressiveness can be added dimensions, depending on whether Covin and Slevin (1989) or Lumpkin and Dess (1996) approach is applied.

As Rauch et al. (2009), Rosenbusch, Rauch, and Bausch (2013) and Gupta and Dutta (2018) studies confirmed, Miller (1983) conceptualisation is by far the most dominant EO perspective in the literature. Entrepreneurial firms are thus those that exhibit innovation (i.e. introducing new products, processes and business models), proactivity (i.e. actively inserting new products and/or developing market spaces) and risk taking (i.e. making strategic decisions to commit resources to projects with uncertain results) (Anderson et al., 2015).

Since Lyon, Lumpkin, and Dess (2000) study was published, researchers have made considerable progress in measuring EO, and Covin and Slevin (1989) scale has been modified in various ways over the years. The most common revision has been assessing EO on a five-point Likert scale rather than the original forced-choice items (Kreiser, Marino, & Weaver, 2002; Tang, Tang, Marino, Zhang, & Li, 2008). Another way in which Covin and Slevin (1989) instrument has frequently been modified consists of changing the number of items

Table 1

Brief description of some EO scales.

Source: Author.

Author	Country	Sample number and sector, firm or individual level	Scale and number of items	Comments on items
Covin and Slevin (1989)	United States (US)	– 161 small and medium-sized enterprises (SMEs) in Pittsburgh, Pennsylvania – Small industrial firms (25 different sectors) – Firm – 147 entrepreneurs who started (105) or bought a business (42) – Firm – 70 chief executive officers involved in founding shortline railroads – Firm – 169 industrial firms – Firm – 124 managers – 94 firms – Firm – 211 UK firms – Firm – 319 masters of business administration students in the first study and 125 students in the second study – Individual – 252 religious organisations – Firm – 232 firms based in Canada from all sectors – Firm – 607 firms in Shanghai, as well as in the Chinese provinces of Shaanxi, Sichuan, Liaoning, Guangdong, Shandong, Henan and Shanxi – Firm – SMEs – 207 firms – Firm – 1575 management students from 4 countries – 517 US, 277 Turkey, 352 Hong Kong, and 429 India – Individual	3 dimensions (9 items): innovativeness, risk taking and proactivity 3 dimensions: innovativeness, risk taking and proactivity 3 dimensions (9 items): innovativeness, risk taking and proactivity 3 dimensions: innovativeness, risk taking and proactivity 11 first-order items - Not specified 22 items 19 items 7 items 6 items 8 items 13 first-order items	- Origin of strategic approach to EO: 1–3 - > innovativeness 4–6 - > proactivity 7–9 - > risk taking - Scale items based on Covin and Slevin (1989) - Scale items based on Covin and Slevin (1989) - Scale items based on Covin and Slevin (1986) - Only 2 items — proactivity and aggressive competitiveness — added to 9-item scale developed and validated by Covin and Slevin (1986, 1989) – Most items adapted from Lumpkin and Dess (1996) – Previously unpublished specific items – Covin and Slevin's scale (1989) for innovativeness, risk taking and proactivity – Scale assessing autonomy developed for study – Covin and Slevin (1989) scale with the addition of Lumpkin and Dess (1996) items – Items adapted for use in religious non-governmental organisations - Scale items based on Covin and Slevin (1989) - Scale items based on Covin and Slevin (1989) - Scale items based on Covin and Slevin (1989) - Scale items based on Covin and Slevin (1989) 4 — risk taking 4 — innovativeness 5 — proactivity
Becherer and Maurer (1997)	US			
Sapienza and Grimm (1997)	US			
Barringer and Bluedorn (1999)	US			
Lumpkin and Dess (2001)	US			
Hughes and Morgan (2007)	United Kingdom (UK)			
Lumpkin et al. (2009)	US			
Pearce, Fritz, and Davis (2010)	US			
De Clercq, Dimov, and Thongpapanl (2010)	Canada			
Zhao, Li, Lee, and Chen (2011)	China			
Anderson and Eshima (2013)	Japan			
Goktan and Gupta (2015)	US, Turkey, Hong Kong, India			

included. Table 1 presents relevant authors' work by country, sector and number of sample elements, as well as indicating the scale used and its number of items.

MacKenzie (2003) cautions that adding or removing items from a well-established scale may compromise its reliability. However, other researchers have noted that the removal of one or more items from the original Covin and Slevin (1989) scale is not uncommon and that dropping some items appears not to diminish this OE scale's content validity (Anderson & Eshima, 2013).

2.2. Individual entrepreneurial orientation

The concept of IEO is based on the idea that entrepreneurs can be an economic resource when they implement their entrepreneurial ability to recognise, seek and successfully exploit viable business opportunities. Kollmann et al. (2007) developed this conceptualisation in a context of pre-nascent entrepreneurs, elaborating IEO's relationship with specific environmental factors such as cultural, political-legal, macroeconomic and microeconomic environments. The cited authors also point out that, at the beginning of the entrepreneurial process, pre-nascent entrepreneurs are confronted with various environmental influences.

Subsequently, Dickson and Weaver (2008) suggested that EO can be, to a large extent, a strategic response to institutional forces. These authors suggest that SMEs are more likely to adopt an EO when it is seen as a legitimate response and in line with the normative, regulatory and cognitive aspects of the institutions that make up the firms' environment. Dickson and Weaver (2008) further report that business leaders seek legitimacy by adopting a strategic stance that is consistent with institutional expectations and behaviours.

According to Bolton and Lane (2012), Joardar and Wu (2011) and Kropp, Lindsay, and Shoham (2008), the EO construct at a firm level also has great potential as an individual phenomenon. Thus, IEO is conceived as a holistic assessment of individuals' tendency towards entrepreneurship (Basso et al., 2009). The notion of IEO's unique contribution to research on entrepreneurship may be a focus on decision-makers' general tendencies in relation to decisions and entrepreneurial initiatives, whether within established firms or outside organisational boundaries (Kollmann et al., 2007). IEO can, therefore, be measured at both the firm and individual levels (Covin & Miller, 2014).

Recent studies have found EO to be a particularly relevant psychological construct for understanding individuals' behaviours in the workplace (Bolton & Lane, 2012). Experts have put an increasing emphasis on developing and encouraging entrepreneurial trends and practices among workers at all organisational levels (Taatila & Down, 2012), so the need to study IEO has become more urgent (Gupta, Niranjana, Goktan, & Eriskun, 2015).

Various researchers have conceptualised IEO as a psychological concept that captures beliefs, values and practices affecting decisions and initiatives in response to change (e.g. Bolton & Lane, 2012; Taatila & Down, 2012). While some authors (e.g. Slevin & Terjesen, 2011) have questioned the application of EO at an individual level, Krauss, Frese, Friedrich, and Unger (2005) argue that the construct was originally developed within psychological research to distinguish individuals with entrepreneurial tendencies from more conservative managers. Thus, EO as an individual-level construct is based on the indisputable fact that entrepreneurs carry out initiatives through day-to-day operations and organisational tasks in these individuals' search to achieve viable and desirable results (Fellnhöfer, 2016).

As far as EO measurement is concerned, three non-survey-based approaches are emphasised in the literature. The first is the computer-aided text analysis approach pioneered by Short, Payne, Brigham, Lumpkin, and Broberg (2009) and Short, Broberg, Coglisier, and Brigham (2010). The second non-survey technique is the use of secondary data to assess EO, with some researchers (e.g. Covin & Wales, 2019; Lyon et al., 2000) advocating more 'objective' EO indicators

using this type of data (e.g. Miller & Le Breton-Miller, 2011). The last approach was developed by Ferreira, Marques, Bento, Ferreira, and Jalali (2015) based on Bana e Costa and Vansnick (1994) and Bana e Costa, De Corte, and Vansnick (2012) work, which classifies individuals according to their entrepreneurial profile.

2.3. New dimensions in entrepreneurial orientation: passion and perseverance

Despite the EO concept's extensive use, the controversy still remains unresolved about how to measure this construct properly (Covin & Lumpkin, 2011; Covin & Wales, 2012). Lyon et al. (2000) raise the question of improving the conceptualisation of EO and observe that little progress has been made in developing new approaches to EO assessment (Covin & Wales, 2012). Covin and Miller (2014), in turn, call for studies that include the assessment of potential unrecognised elements of EO, a challenge that was answered by Gerschewski et al. (2016) with a qualitative study based on in-depth semi-structured interviews with eight entrepreneurs. The latter cited authors were able to identify two new significant EO elements: perseverance and entrepreneurial passion.

In this context, important research has been conducted by Ferreira et al. (2015), who propose a multi-criteria decision analysis framework to assist IEO measurement. The cited authors report that relevant decision-makers identify three major domains or IEO dimensions — personality traits, qualifications and complementary aspects. In this model, passion is integrated into complementary aspects, thereby underlining the importance of issues related to motivational drivers and levels of integration.

As mentioned previously, entrepreneurial passion was one of two new EO dimensions identified by Gerschewski et al. (2016). This has been described as a fundamental emotion needed to succeed in business. While passion is a necessary component of successful entrepreneurship, passion alone is not enough since even passionate entrepreneurs can fail if they lack the required business skills (Gerschewski et al., 2016).

Entrepreneurial passion has been defined in the literature as a set of intense positive feelings that are consciously accessible and experienced by those involved in entrepreneurial activities linked with roles entrepreneurs consider significant (Cardon et al., 2009). In the field of psychology, entrepreneurial passion has been connected to a strong inclination towards enjoyable activities, which the individuals involved consider important and in which they invest time and energy (Vallerand et al., 2003). Passion is an intense positive emotion with a motivational effect that encourages entrepreneurs to overcome obstacles and remain involved in business projects (Cardon et al., 2009).

Smilor (1997, p. 342) observes that passion is 'perhaps the most observed phenomenon of the entrepreneurial process'. Cardon, Zietsma, Saporito, Matherne, and Davis (2005) state that entrepreneurial passion is at the heart of entrepreneurship, while Ma and Tan (2006) argue that entrepreneurship is the embodiment of passion. Cardon et al. (2005) use the metaphor of parenthood, describing entrepreneurship as a relationship between parent and child in which entrepreneurs feel a sense of attachment and identification with their own firm analogous to the process of raising children. Thus, values such as passion, identification, attachment and affection, as well as fear, rejection and repentance, are key attributes of the entrepreneurial process (Cardon et al., 2005).

In addition, Baum, Locke, and Smith (2001) report that passion has an indirect positive relationship with business growth, which is mediated by variables such as vision, goals, self-efficacy, competence, motivation and competitive strategy. Passion has also been found to enable more extensive recognition and exploitation of opportunities, as well as the development of new ideas (Baron & Ward, 2004; Shane, Locke, & Collins, 2003) and improved performance (Ho & Pollack, 2014; Iyortsuun, Nmadu, Dakung, & Gajere, 2019).

However, despite the importance researchers attach to passion as a

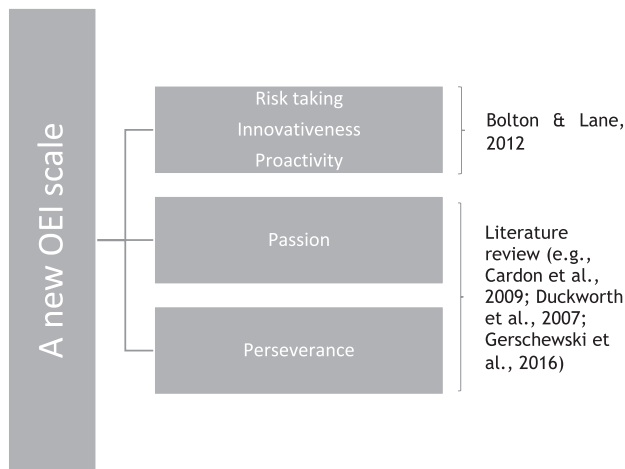


Fig. 1. A new OEI scale proposal.

dimension of EO, various authors have suggested that it has not yet been studied systematically and that the existing studies are largely fragmented (Baron, 2008; Baum & Locke, 2004; Cardon et al., 2009; Cardon, Foo, Shepherd, & Wiklund, 2012; Drnovsek, Cardon, & Patel, 2016; Stenholm & Nielsen, 2019). In particular, few empirical studies of passion among entrepreneurs have been conducted (e.g., Iyortsuun et al., 2019; Shane et al., 2003).

The second new dimension related to EO identified by Gerschewski et al. (2016) is perseverance. This has been described as a necessary condition for being successful at starting and carrying out entrepreneurial ventures (Baum & Locke, 2004). Perseverance is related to a continuous search for established goals despite adversity (van Gelderen, 2012). According to Baum and Locke (2004), perseverance also involves sustaining goal-oriented actions and energy levels even when confronted with obstacles. In terms of entrepreneurship, Markman et al. (2005) propose that perseverance and, more specifically, the way individuals react differently to adverse situations may determine the success of their new business.

Researchers have also found that perseverance has an indirect effect on business growth (Baum & Locke, 2004), and this trait is linked to successful leadership (Kirkpatrick & Locke, 1991) since effective leaders have strong willpower or perseverance (Bass & Stogdill, 1990). In addition, studies have been carried out on the determinants of perseverance in the business start-up phase, emphasising the role of entrepreneurs' cognitive orientation. For example, Gatewood, Shaver, and Gartner (1995) confirmed that entrepreneurs who present internal and/or stable reasons for establishing their business (e.g. 'I always wanted to own my own business') are more likely to persist in their initiatives. This then leads to the successful creation of new ventures.

In addition, Baron (2004) showed that entrepreneurs are significantly less likely to engage in factual thinking (e.g. 'what could have been') in the business consolidation process, and these individuals experience significantly less regret over past actions compared to non-entrepreneurs. After operationalising perseverance as perceived control over adversity and responsibility for outcomes despite adversity, Markman et al. (2005) found that entrepreneurs tend to have higher levels of perseverance than non-entrepreneurs do. Perseverance is also positively related to annual income (Markman et al., 2005), potentially functioning as a general, albeit rudimentary, indicator of personal success.

Thus, perseverance is related to fighting to achieve ongoing goals despite adversity and is consequently tied to firms' survival. However, while perseverance is undoubtedly necessary for business success, the literature underlines a primary need for critical business skills, especially in light of previous researchers' findings. A lack of appropriate management skills and financial mismanagement (e.g. a poor business

record, inadequate knowledge and lack of capital) are the two main causes of business failure (Berryman, 1993; Hall & Young, 1991).

Based on previous empirical studies, Gerschewski et al. (2016) propose that passion and perseverance should be considered new elements of EO since they are conceptually distinct from and complementary to the standard dimensions of proactivity, innovativeness and risk taking. Notably, passion is an emotion, and perseverance is a trait, whereas the three dimensions of proactivity, innovativeness and risk taking can be defined as behaviours. For instance, researchers have reported that perseverance is a sub-dimension of consciousness—one of the so-called 'big five' personality traits—which has been found to be positively related to entrepreneurial intentions and performance (Zhao & Seibert, 2006; Zhao, Seibert, & Lumpkin, 2010).

In summary, a greater emphasis on more explicit incorporation of IEO theoretical perspectives in the literature could help to further the existing understanding of how and why IEO affects entrepreneurship results. In addition, this more explicit approach may facilitate a deeper understanding of the important contextual considerations of when and where the EO-results relationship is significantly strengthened or weakened (Wales, 2016). Miller (2011) specifically encourages researchers to extend their theoretical range beyond already suggested areas, noting that several hitherto unrecognised theories could be available in other functional disciplines. These fresh perspectives may help to provide more light on important issues in EO research.

2.4. Proposed new Individual Entrepreneurial Orientation scale

The literature review's results provided the basis on which to propose a new IEO scale. The scale's items were drawn from Bolton and Lane (2012), Cardon et al. (2009), Duckworth et al. (2007) and Gerschewski et al. (2016) work (see Fig. 1).

3. Methodology

3.1. Sample and procedure

The measurement instrument used in this study was a questionnaire distributed online and in a paper format between April and November 2018 to Portuguese agri-food firms in the Trás-os-Montes and Alto Douro (TMAD) region, which was created only five years ago. Potential respondents were contacted via email and in person, using information collected from the TMAD intermunicipal communities' database of 400 agri-food firms. A total of 249 completed questionnaires were obtained, for a response rate of 62.25%.

The final sample was 59.4% male, and the male respondents' average age was slightly higher than that of the females (42.3 vs 39.8 years old). Most respondents were married or in non-marital partnerships (65.5%) and already had a higher education degree (54.6%), with the women's level of education being slightly higher than that of the men (57.4% vs 52.7% with university degrees). In the sample, 62.7% had children, and 29.7% cared for older relatives, but the latter percentage was higher for women (33.7%) than for men (27.0%).

Regarding firm size, the majority of the respondents were micro-firms (63.2%), with a further 28.9% categorised as small to medium-sized firms and 7.9% as medium-sized firms. The entrepreneurs' sector of activity included the following: fruit (16.9%), wine (16.1%), animal production (9.2%), dried fruit (7.2%), smoked products (5.6%), honey (4.4%), olive oil (4%) and milk (1.6%), among others (e.g. jams and mushrooms [34.9%]).

3.2. Item selection

The items of the proposed IEO scale were selected from items related to Miller (1983) original three dimensions of risk taking, innovativeness and proactivity, following the procedure proposed by

Bolton and Lane (2012). In addition, the respective EO measures provided by Lumpkin and Dess (1996) were reformulated from a focus on firms and/or organisations to target individuals. The wording of the validated measures provided by Lumpkin, Coglisier, and Schneider (2009) were changed, for example, from ‘my firm’ and ‘my firm’s managers’ to ‘I’ and ‘business opportunities’ to ‘opportunities’ (see the appendix). Similarly, references to business goals were changed to project or team goals, and references to business objectives were generalised to project objectives. Responses to items used a 7-point Likert scale (1 = ‘Totally disagree’; 7 = ‘Strongly agree’).

The proposed items that assessed the IEO dimension of passion were based on the literature review and Cardon et al. (2009) and Gerschewski et al. (2016) qualitative studies, which defined various aspects of entrepreneurial passion (see the appendix). The first is the passion to invent or create involving activities associated with exploiting new market opportunities, developing new products or services and working with new prototypes. This aspect corresponds to item Pa1: ‘I have a passion for finding good business opportunities, developing new products or services, exploiting business applications or creating new solutions to existing problems and needs.’

The second aspect of this emerging dimension is a passion for creating business initiatives, which is another facet proposed by Cardon et al. (2009) and which comprises the gathering of the financial, human and social resources needed to create a new business (see the appendix). This aspect was assessed with item Pa2: ‘I am passionate about the process of gathering the financial, human and social resources (e.g. contacts and partnerships) needed to create a new business.’ The third aspect is a passion for developing business ventures associated with the process of firm growth and expansion after creation (Cardon et al., 2009). This facet was reflected in item Pa3: ‘I have a passion for envisioning, growing and expanding my business.’ The last aspect is a passion for work, assessed with item Pa4: ‘I am passionate about what I do, and, when I am away from my business, I cannot wait to return.’

With regard to the other new dimension in the proposed IEO scale—perseverance—the associated items were, in general, based on items selected from Duckworth et al. (2007) scale. The chosen items covered the perseverance of effort dimension included in the cited authors’ Grit Scale and Gerschewski et al. (2016) work. These items sought to capture the attitudes and behaviours characteristic of high performance individuals, without specifying a single domain of life (e.g. work or school), particularly with respect to the respondents’ ability to maintain a sustained effort in the face of adversity. These aspects were reflected in items Pe1 (‘I have achieved a goal that took me some time to reach’), Pe2 (‘I have overcome setbacks to meet a major challenge’), Pe3 (‘I always finish what I start’), Pe4 (‘Setbacks do not discourage me’) and Pe5 (‘In many complex situations, I persist in achieving my goals despite seeing others give up’).

4. Results presentation and analysis

4.1. Measurement instrument validation

Confirmatory factor analysis (CFA) was carried out with IBM SPSS AMOS 24 software in order to validate the psychometric characteristics of the proposed multidimensional IEO scale assessing the surveyed entrepreneurs’ EO levels (Arbuckle, 2016). Some of the assumptions underlying structural equation modelling in general and CFA in particular are multivariate normality and the absence of outliers. To assess the first assumption, the values of the asymmetry coefficients (Sk) and kurtosis (Ku) were calculated using uni- and multivariate analyses. No variable presented Sk and Ku indicator values that severely violated the normal distribution ($|Sk| < 3$ and $|Ku| < 10$) (Kline, 2005).

The presence of outliers was measured by the squared Mahalanobis distance (MD^2). The results for one respondent’s data presented MD^2 values that suggested the presence of an outlier, so the model was adjusted without considering this firm’s data. The use of CFA also

facilitated an evaluation of the constructs’ reliability and validity (Garver & Mentzer, 1999; Hair, Black, Babin, & Anderson, 2009), which were tested on four levels: factorial validity, convergent validity, discriminant validity and construct reliability.

The overall goodness of fit of the factorial model was measured by standard indices and their respective values (i.e. chi-square [χ^2]/degrees of freedom [df], comparative fit index [CFI], Goodness-of-fit index [GFI], parsimony [P]CFI, PGFI, root mean square error of approximation [RMSEA], $P[RMSEA \leq 0.05]$ and modified expected cross-validation index [MECVI]). The local adjustment’s quality was evaluated by the factor loadings and items’ individual reliability. The model was refined based on the values of the Lagrange multiplier (LM) modification indices produced by AMOS software (Byrne, 2010). Trajectories and/or correlations with $LM > 4$ ($p < 0.001$) were considered to be indicators of significant variation in model quality.

4.2. Results

The five-factor IEO model was adjusted based on the data collected on 249 agri-food sector entrepreneurs, but the resulting model showed poor goodness of fit ($\chi^2/df = 4.256$; CFI = 0.792; GFI = 0.788; PCFI = 0.658; PGFI = 0.589; RMSEA = 0.115; $P[RMSEA \leq 0.05] < 0.001$; MECVI = 2.858). After the aforementioned outlier was removed, items Pa4 and Pe2 still presented factor loadings lower than 0.5, and the modification indexes for items R2, I3, Pr1, Pa2 and Pe1 suggested saturation on factors other than those suggested by the research model. Thus, these items also needed to be removed. As a result, the model’s goodness of fit improved considerably ($\chi^2/df = 2.563$; CFI = 0.945; GFI = 0.932; PCFI = 0.630; PGFI = 0.526; RMSEA = 0.080; $P[RMSEA \leq 0.05] = 0.004$; MECVI = 0.747). All items in the final model present factor loadings greater than 0.5, which confirms factorial validity (Hair et al., 2009).

The factors’ composite reliability (CR) was high: 0.844 for perseverance, 0.783 for risk taking, 0.760 for innovativeness, 0.759 for passion and 0.746 for proactivity ($CR \geq 0.7$). In addition, all the factors’ Cronbach’s alpha (α) values were higher than 0.7, so the construct reliability was found to be adequate. The average variance extracted (AVE), an indicator of the factors’ convergent validity, was also found to be adequate ($AVE \geq 0.5$): 0.647 for perseverance, 0.643 for risk taking, 0.612 for passion, 0.605 for proactivity, and 0.516 for innovativeness. Table 2 presents the standardised factor loadings, CR (i.e. construct reliability), Cronbach’s alpha (α) and AVE for the IEO dimensions in the simplified model.

Discriminant validity can be confirmed by checking various conditions (e.g. Anderson & Gerbing, 1988; Fornell & Larcker, 1981; Hair et al., 2009). However, Fornell and Larcker (1981) report that the most rigorous test consists of comparing the AVE values of any two constructs with the square of the correlation between these factors. The factors’ AVE should be greater than the square of the correlation.

Table 3 shows the correlations between the first-order factors of the IEO construct and, on the diagonal, the square root of AVE of each. These results reveal that the square roots of the factors’ AVE are higher than the correlations between them, thereby verifying discriminant validity.

Fig. 2 presents the values of the standardised factor loadings and the individual reliability of each item in the final simplified model.

5. Discussion of results

The process of developing an IEO scale with two emerging dimensions (i.e. passion and perseverance) produced a multidimensional instrument with five distinct factors shown to have adequate reliability and validity. Three of these factors are widely considered to be EO’s core dimensions, so they should always be included in IEO scales, regardless of the proliferation of studies proposing other combinations of EO dimensions (George & Marino, 2011; Wales et al., 2013). This

Table 2
Standardised factor loadings (λ), CR and AVE of IEO dimensions.
Source: Author.

Factor	Item	Question	λ	CR	Cronbach's α	AVE
Risk taking	R1	I like to venture into the unknown and make risky decisions.	0.759	0.783	0.769	0.643
	R3	I tend to act boldly in risky situations.	0.843			
Innovativeness	I1	I often like to try new and unusual activities.	0.635	0.760	0.755	0.516
	I2	In general, I prefer a strong emphasis on innovative approaches rather than previously tested and used approaches.	0.733			
	I4	I am in favour of trying out new approaches to problem solving rather than using methods that others often use.	0.779			
Proactivity	Pr2	I tend to plan projects in advance.	0.609	0.746	0.715	0.605
	Pr3	I would rather get up and put projects in motion than sit around waiting for someone else to do it.	0.916			
Perseverance	Pe3	I always finish what I start.	0.673	0.844	0.833	0.647
	Pe4	Setbacks do not discourage me.	0.848			
	Pe5	In many complex situations, I persist in achieving my goals despite seeing others give up.	0.877			
Passion	Pa1	I am passionate about finding good business opportunities, developing new products or services, exploring business applications or creating new solutions to existing problems and needs.	0.793	0.759	0.758	0.612
	Pa3	I have a passion for envisioning, growing and expanding my business.	0.771			

Table 3
Discriminant validity — correlations between IEO dimensions and square roots of AVE.

	(1)	(2)	(3)	(4)	(5)
(1) Risk taking	0.802*				
(2) Innovativeness	0.679	0.718*			
(3) Proactivity	0.317	0.622	0.778*		
(4) Perseverance	0.328	0.461	0.682	0.804*	
(5) Passion	0.132	0.415	0.651	0.632	0.782*

Note: * = square root of AVE.

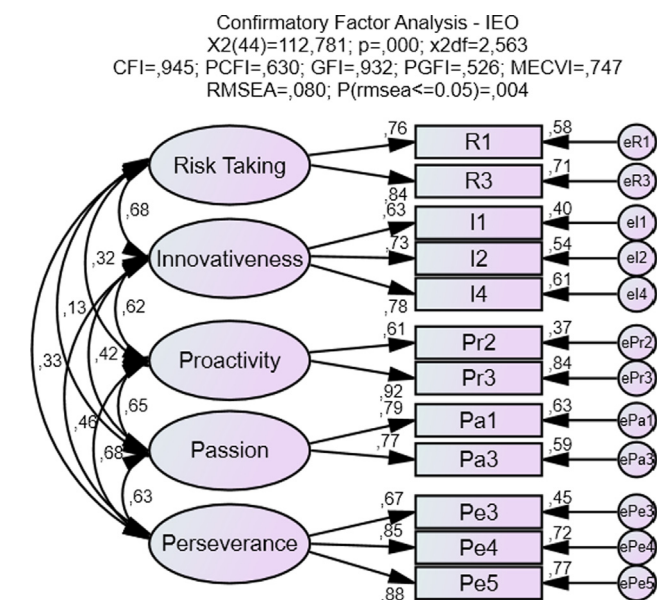


Fig. 2. Standardised factor loadings, individual reliability of each item for the factors and correlations between factors in the simplified final model.

approach helps to promote conceptual stability and the accumulation of knowledge in research on EO. The need to include innovativeness, proactivity and risk taking has been confirmed by a number of recent conceptual studies (Anderson et al., 2015) and by most previous empirical research on EO (Rauch et al., 2009; Wales et al., 2013).

Nonetheless, by proposing a different combination of dimensions, the present study sought to take into account Covin and Lumpkin (2011) observation that the exploration of alternative EO dimensions in research has high potential. In addition, George and Marino (2011) provide proof of the benefits of including additional features or

adapting EO dimensions to specific contexts. Covin and Miller (2014) also alert researchers to the need to suggest alternative dimensions in studies of EO in international contexts.

Therefore, according to the results obtained for the scale proposed in the present study, an individual with EO will present all five characteristics: proactivity, risk taking, innovativeness, passion and perseverance. Furthermore, IEO (i.e. the second-order construct) will intensify with each increase in the level of each dimensions (i.e. the first-order constructs). The proposed model has a well-defined set of structural relationships with two levels (i.e. first and second order) in which the second-order construct (IEO) is reflected in the various dimensions of the first-order constructs. Thus, this IEO model constitutes a second-order reflexive model (MacKenzie, Podsakoff, & Jarvis, 2005). The present results are consistent with Dai, Maksimov, Gilbert, and Fernhaber (2014) work, which assumes IEO's multidimensionality and considers that the fragmented use of dimensions may be more useful than the aggregate measure associated with Miller (1983) scale. The current findings on passion and perseverance suggest that these two dimensions should be considered an integral part of an alternative conceptualisation of IEO, thereby contributing to the literature on this topic.

In the process of adjusting the original measurement instrument with 19 items, 7 items were removed, so the final scale comprises 12 items. The dimension of entrepreneurial passion includes elements related to the dynamics of creating new products or services and recognising new opportunities for strengthening start-up firms' presence in the relevant markets. In addition, a passion for growing businesses is again associated with the creation of new strategies for firm growth. This corroborates Vallerand et al. (2003), Matasar (2006), Cardon et al. (2009), Cardon, Gregoire, Stevens, and Patel (2013), Chen, Liu, and He (2015), Gerschwski et al. (2016), Montiel Campos (2017) and Santos et al. (2018) findings. Notably, the present study's sample covered firms created in the last five years and in a growth and expansion phase.

Regarding the perseverance dimension, the final model considers items related to present and future initiatives, again explaining the impetus behind the creation of persistence- and resilience-based strategies for finalising and accomplishing tasks inherent to business objectives. Entrepreneurs with perseverance can assess the various alternatives to be explored and evaluated so as not to 'drop their defences' when faced by challenges, adversities and setbacks that appear throughout the firm cycle. These entrepreneurs strive for their firms' success and survival, thereby corroborating Baum and Locke (2004), Markman et al. (2005), Muehlfeld, Urbig, and Weitzel (2017), and Gerschwski et al. (2016) studies.

6. Conclusions and managerial implications

The proposed scale was developed in response to the lack of measurement instruments consistent with an individual-level evaluation of IEO. This scale thus evaluates IEO dimensions that can lead people to establish new, innovative and risky business ventures and promote improvements that facilitate organisations' successful business behaviours.

Studies of passion and perseverance have received increasing attention in the area of management research in the last decade. Thus, this study proposed that these emerging dimensions are an integral part of a multidimensional IEO construct since, in strategic terms, they influence individuals' capacity to delineate the future, set goals and achieve results. In addition, IEO enhances firms' capacity to transform entrepreneurial opportunities into new growth trajectories. Perseverance, according to Howe (1999), is at least as crucial as intelligence to achieving results and entrepreneurial success.

The body of literature on the role of passion and perseverance in entrepreneurship has grown in recent years, and these dimensions have been validated as distinct at the individual level (Gerschewski et al., 2016). However, a number of empirical questions still remain unanswered about the role of passion and perseverance in entrepreneurial processes. Therefore, the present study should be of interest to those who seek to analyse IEO at different levels since this research explicitly sought to provide researchers with a tested and validated IEO measurement instrument. Furthermore, the proposed scale includes the underexplored concepts of entrepreneurial passion and perseverance, thereby contributing to a more accurate characterisation of IEO. The results highlight that, as individual characteristics, passion and perseverance have implications for entrepreneurs because their IEO influences their business management practices.

Regarding practical implications, the above findings emphasise the importance of using the proposed IEO measurement instrument in

research because it is a significant tool with which to understand IEO more fully. Thus, this IEO scale can be used to provide influential information and decision support for researchers, educators, trainers and career managers.

More specifically, the current results provide an important starting point for understanding IEO in the agri-food sector. However, the proposed scale can easily be tested and validated for other sectors. It can also be adapted to be applied in research on intrapreneurs in the private, public and third sectors.

This fuller understanding of IEO dimensions offers opportunities for researchers to explore the link between the five dimensions and other relevant factors. In addition, the findings also help entrepreneurs to understand better their own strengths when developing business ventures. IEO can therefore be an influential factor in various decision processes, namely, the recognition of opportunities and improvement of firm performance.

Although the proposed IEO construct presents notable possibilities, this study's results are subject to some limitations, which offer opportunities for future investigations. The sample's representativeness should be strengthened to develop a greater robustness of the proposed construct. The sample was also restricted to a single geographical area. An effort needs to be made to validate further the five IEO dimensions using entrepreneurs from other sectors of activity in other parts of Portugal and the world, as well as from other age groups. Future research could also apply the present five-dimension scale by developing a model that evaluates IEO's influence on performance and verifies the presence of gender differences in this area.

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Appendix A

Individual Entrepreneurial Orientation Scale

- | | |
|-----|---|
| R1 | I like to venture into the unknown and make risky decisions. |
| R2 | I am willing to invest a great deal of time and/or money into something that can give high returns. |
| R3 | I tend to act boldly in risky situations. |
| I1 | I often like to try new and unusual activities. |
| I2 | In general, I prefer a strong emphasis on innovative approaches rather than previously tested and used approaches. |
| I3 | I prefer, when I learn something new, to try to do it my way than to do it like everyone else does. |
| I4 | I am in favour of trying out new approaches to problem solving rather than using methods that others often use. |
| Pr1 | I usually act in anticipation of future problems, needs or changes. |
| Pr2 | I tend to plan projects in advance. |
| Pr3 | I would rather get up and put projects in motion than sit around waiting for someone else to do it. |
| Pa1 | I have a passion for finding good business opportunities, developing new products or services, exploiting business applications and creating new solutions for existing problems and needs. |
| Pa2 | I am passionate about the process of gathering the financial, human and social resources (e.g. contacts and partnerships) needed to create a new business. |
| Pa3 | I have a passion for envisioning, growing and expanding my business. |
| Pa4 | I am passionate about what I do, and, when I am away from my business, I cannot wait to return. |
| Pe1 | I have achieved goals that took me some time to reach. |
| Pe2 | I have overcome setbacks to meet major challenges. |
| Pe3 | I always finish what I start. |
| Pe4 | Setbacks do not discourage me. |
| Pe5 | In many complex situations, I persist in achieving my goals despite seeing others give up. |

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