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Contact to corresponding author: Eduardo Terán-Yépez, eduardo.teran@ual.es

Eduardo Terán-Yépez
University of Almeria (CIMEDES Research Center and ceiA3), Spain
 orcid.org/0000-0002-1260-2477

David Jiménez-Castillo
University of Almeria (CIMEDES Research Center and ceiA3), Spain
 orcid.org/0000-0002-2302-1002

Manuel Sánchez-Pérez
University of Almeria (CIMEDES Research Center and ceiA3), Spain
 orcid.org/0000-0003-3709-3389

The effect of international opportunity recognition processes on problem-solving competence: how does past negative entrepreneurial experience matter?

Abstract

Research background: Little research addresses how identifying an opportunity in the international market, whether through active search or serendipitous discovery, may have implications for the subsequent gestation behaviors. An emerging body of research suggests addressing this deficiency by focusing on the cognitive and experience-based factors that international entrepreneurs use to develop an opportunity in the foreign market once identified.
Purpose of the article: The aim of this study is to explore the role of active and serendipitous international opportunity recognition (IOR) in entrepreneurs' problem-solving skills (problem-

solving speed and creativity), as well as the moderating effect of past negative entrepreneurial experience (PNE) on such relationships.

Methods: This study used the survey data collection method through an online self-administered questionnaire. Partial least square structural equation modeling (PLS-SEM) method was used to analyze the results over a sample of Spanish international entrepreneurs.

Findings & value added: The results show that entrepreneurs that have identified an international opportunity (IO) actively are better equipped to solve problems speedily than those that have discovered an IO serendipitously. In contrast, entrepreneurs who identified an IO serendipitously are better equipped to solve problems creatively. Furthermore, the impact of active search on problem-solving speed is greater for entrepreneurs without PNE, and the impact of active search on problem-solving creativity is greater for entrepreneurs with PNE. Also, it is found that PNE does not moderate serendipitous IOR relationship with problem-solving competence. These findings are relevant as they indicate that the IOR processes have implications for the subsequent gestation behaviors. Thus, the value added of this study is the combination of cognitive and experience-based factors of the international entrepreneur to enrich the link between IOR processes and IO development. These are two intertwined and interdependent processes, which, however, have been scarcely studied as a whole. The results of this research help international entrepreneurs to understand how and why the way they recognized an IO and having or not PNE influence their problem-solving skills during the IO development phase.

Introduction

The identification and development of international market opportunities are critical for firms' international expansion since, without recognition and development, international opportunities (IOs) cannot be exploited (Chandra *et al.*, 2009). As entrepreneurs often play a crucial role in these activities, one of the topics that have recently attracted the interest of international entrepreneurship (IE) academics and practitioners is to understand how entrepreneurs recognize and develop IOs (Chetty *et al.*, 2018; Di Gregorio *et al.*, 2021; Hilmersson *et al.*, 2021a).

Drawing on opportunity identification theory (Ardichvili *et al.*, 2003), the literature argues that entrepreneurs recognize IOs through active search or serendipitous discovery (Tabares *et al.*, 2021). Active search claims for the identification of IOs through a systematic search of information and regular analysis of the international market (Hilmersson *et al.*, 2021a; Tuomisalo, 2019), while in serendipitous discovery, IOs are recognized through entrepreneurs' alertness and sensitivity during passive search situations (Kiss *et al.*, 2020; Kontinen & Ojala, 2011). Although an effort has been made in recent years to study the international opportunity recognition (IOR) phenomenon in greater depth, research has mainly been focused on how and why entrepreneurs identify IOs either by active search or serendipitous discovery (Galan & Torsein, 2021; Zaefarian *et al.*, 2016). However, the IOR is nothing more than the beginning of the IE process and, after recognizing an IO through purposeful search or fortuitous circumstance,

international entrepreneurs enter into a development stage where the IO is evaluated and where they typically have to solve a whole set of problems that result from the internationalization challenges (Di Gregorio *et al.*, 2021; Hilmersson *et al.*, 2021b; Tabares *et al.*, 2021).

The differences between active search and serendipitous discovery arise a question regarding whether the way entrepreneurs identify a new international market opportunity can affect how they face the emergence of problems and challenges that are common during international business activities (Chandra *et al.*, 2020; Ji *et al.*, 2016) and can limit opportunity development and exploitation. This issue is particularly relevant concerning entrepreneurs' problem-solving skills as they are seen as key competitive entrepreneurial and managerial weapons to successfully develop and exploit an IO (Mostafiz & Goh, 2018; Tabares *et al.*, 2021). Problem-solving skills, referred to as problem-solving speed and problem-solving creativity (Atuahene-Gima & Wei, 2011), help entrepreneurs to overcome the challenges that can hinder the opportunity to operate overseas, as they imply developing timely, novel, and cost-effective solutions that lead to the exploitation of the IO (Chandra *et al.*, 2020; Mainela & Puhakka, 2009). Although recent studies suggest that problem-solving skills are a critical converter that can translate recognized IOs into valuable IOs to exploit (Mostafiz & Goh, 2018; Zucchella, 2021), there is a lack of research that verifies how each IOR approach (active IOR and serendipitous IOR) is related to problem-solving competence and why can there be problem-solving competence heterogeneity among international entrepreneurs.

Accordingly, this study analyzes whether active and serendipitous IOR distinctively determines problem-solving competence during international opportunity development (IOD) process. The theoretical logic for expecting these differences may be found in prior literature which suggests that differences in IOR may substantially affect IOD and entrepreneurs' skills and behavior. Indeed, academics have argued that active and serendipitous IOR differently impacts on opportunity implementation quickness, internationalization speed, and risk-taking propensity (Ciravegna *et al.*, 2014; De Clercq *et al.*, 2012; Hilmersson & Papaioannou, 2015). In this study, we theorize that active international entrepreneurs — those who identify IOs through a purposeful process — tend to solve problems faster than their passive counterparts. On the contrary, we postulate that passive international entrepreneurs — those who identify IOs through a serendipitous process — tend to solve problems more creatively than active international entrepreneurs. In specifying the model, we draw on the entrepreneurial cognition theory (Mitchell *et al.*, 2002) following the recent call of IE scholars to apply psychological theories to offer a richer understanding of individuals' heteroge-

neity, and thus to explore the effect of entrepreneurial mindset (e.g., knowledge, experience, cognition) on their behavior and skills (Wach & Głodowska, 2021; Zucchella, 2021).

Also, previous literature argues that certain individual factors would impact the IOD process. In particular, the nature of previous experience (positive or negative) has been suggested as a critical factor affecting the speed and creativity of decisions (Lafuente *et al.*, 2019; Shepherd *et al.*, 2015). Scholars highlight that international entrepreneurs with past negative entrepreneurial experience (PNE) differ from those without PNE since they show different behaviors and skills (Lafuente *et al.*, 2019; Ucbasaran *et al.*, 2013). In this study, we pay particular attention to PNE as an important experience-based factor for the effectiveness of the relationship between IOR and problem-solving skills. In particular, we postulate that regardless of the type of IOR process, the problem-solving speed of international entrepreneurs with PNE is lesser than those without PNE. Also, we propose that the reverse might be expected for problem-solving creativity; regardless of the type of IOR style, the problem-solving creativity of international entrepreneurs with PNE is greater than those without PNE.

The results of partial least square structural equation modeling (PLS-SEM) analysis using data from Spanish international entrepreneurs largely support our hypotheses. The study provides two main contributions to the IE literature. First, by disentangling the relationship between active and serendipitous IOR and problem-solving skills, we contribute by demonstrating that each IOR perspective differently impacts problem-solving speed and creativity. Thus, we confirm that the way an entrepreneur recognizes an IO is a source of heterogeneity that explains why some international entrepreneurs solve problems that arise during IOD faster and more creatively than others. Second, we also contribute by proving that the nature of past experiences, in our case PNE, can be a factor that moderates the relationship between active IOR and problem-solving skills, but not the relationship between serendipitous IOR and problem-solving skills. Besides, we show that PNE has a dichotomous effect on active international entrepreneurs that either improves or hinders their problem-solving skills.

The rest of the paper is organized as follows. In the following section, we outline the theoretical background of the research and reveal the hypotheses development. Next, we elucidate the research methodology and present the results of the study. Finally, we discuss these results and conclude the study by providing managerial implications, limitations and future research directions.

Literature review and hypotheses development

Relevance of IOR perspectives

How do international entrepreneurs discover IOs? Based on opportunity identification theory (Ardichvili *et al.*, 2003), previous literature suggests two fundamental possibilities: active IOR and serendipitous IOR (Crick & Spence, 2005; Terán-Yépez *et al.*, 2021; Zaefarian *et al.*, 2016). In active IOR, entrepreneurs identify IOs through systematic pursuit and scanning the environment for gaps in the international market (Chetty *et al.*, 2018; Hilmersson & Papaioannou, 2015). This IOR style is based on a rational, deliberate, analytic, and rule-based search and gathering of information that conducts to conscious reasoning (Oyson & Whittaker, 2015; Tuomisalo, 2019). Active IOR includes conducting strategic planning, export market research, goal setting, international market scanning, or competitive analysis, and therefore it enables international entrepreneurs to increase their information and knowledge base (Ciravegna *et al.*, 2014; Muzychenko & Liesch, 2015; Tuomisalo, 2019).

Conversely, in serendipitous IOR, entrepreneurs recognize IOs fortuitously or accidentally, through their gut feeling in the course of other activities (Hilmersson *et al.*, 2021a; Kiss *et al.*, 2020). Since this IOR style is not based on any form of planned search, scholars point out that it eases and fasts IOR (Crick & Spence, 2005). Although the serendipitous IOR is considered fortuitous, previous research states that it is not pure luck (Chandra *et al*., 2009; Galan & Torsein, 2021) but rather that international entrepreneurs alertness in passive search situations and the assimilation that the information received by chance could be of value are the main drivers of this process (Chetty *et al.*, 2018; Kontinen & Ojala, 2011). These IOs are mainly identified in unexpected conversations with friends and colleagues, when reading newspapers, or during vacations (Kiss *et al.*, 2020; Zaefarian *et al.*, 2016).

Previous research has suggested that differences in IOR may have substantial effects both on IOD and over entrepreneurs' skills and behavior. For example, scholars have found that active and serendipitous IOR differently influence opportunity implementation quickness, internationalization speed, idea generation, idea newness, risk-taking propensity, and knowledge accumulation (Ciravegna *et al.*, 2014; De Clercq *et al.*, 2012; Hilmersson & Papaioannou, 2015). In this regard, scholars argue that differences in the IOR process impact the timing and speed of implementation in the way that IOs identified fortuitously are implemented more slowly than those identified purposefully (Ciravegna *et al.*, 2014). Research on

internationalization speed states similar behavior, as it stipulates that IOs recognized through deliberate search lead to a quicker internationalization than those IOs identified fortuitously (De Clercq *et al.*, 2012).

Concerning idea generation, scholars suggest that entrepreneurs that rely on serendipitous IOR generate more ideas than entrepreneurs that rely on active IOR (Fiet & Patel, 2008). Regarding idea newness, previous research shows inconclusive and opposite results. Some authors argue that the deliberate identification of IOs leads to a higher degree of idea newness because the search increases the detection of new ideas (Dahlqvist *et al.*, 2004). However, other authors suggest that entrepreneurs with serendipitous IOR predisposition tend to generate more creative and novel ideas with many unique characteristics because you cannot search for what you do not know (Hilmersson & Papaioannou, 2015). Also, when IOs are identified serendipitously, entrepreneurs prefer to take a lower-risk, lower-cost approach to international expansion (Chandra *et al.*, 2015).

Furthermore, as active IOR involves deep reflection, as it leads to high knowledge intensity and facilitates retrieval of relevant knowledge from memory in contrast to serendipitous IOR, which relies on shallow representations and few, superficial knowledge (Jones & Casulli, 2014). Extrapolating from these findings, it is reasonable to expect that differences in the IOR process will also matter concerning problem-solving skills during IOD.

Problem-solving competence in IOD

Atuahene-Gima and Wei (2011) proposed two problem-solving skills: problem-solving speed and problem-solving creativity, which are relevant for new product development and an effective response to market trends. As such, problem-solving competence describes the ability to produce novel solutions and implement them in a timely manner (Atuahene-Gima & Wei, 2011; Morris *et al.*, 2013). In the IE process, and specifically in the IOD stage, problems that arise in the international market are hard to forecast in advance and may require urgent, useful, and cost-effective solutions (Hilmersson *et al.*, 2021b). Thus, problem-solving speed and creativity are critical. as they help overcome the challenges that can hinder the opportunity to operate in the international market (Boso *et al.*, 2019; Chandra *et al.*, 2020). Moreover, these skills have been found to positively influence new venture survival (Stenholm & Renko, 2016), and international entry mode performance (Ji *et al.*, 2016), and the lack of these skills hinder the internationalization process (Chandra *et al.*, 2020). Indeed, previous research has elucidated that problem-solving is the most demanded competence to new

employees by companies facing internationalization activities (Vibhakar & Smith, 2005), and it is also a key competence that should be developed by university students who want to engage in international business activities (Morris *et al.*, 2013).

Atuahene-Gima and Wei (2011) and Hilmersson *et al*. (2021b) suggest that finding quickly many solutions to the problems detected in the international market is not enough, but implementing them speedily is actually a skill. This study conceptualizes *problem-solving speed* as the ability to rapidly find and implement an appropriate number of solutions to the multifaceted internationalization-related problems that jeopardize the exploitation of an IO. Moreover, because the concept of creativity involves novelty and cost-efficiency (Atuahene-Gima & Wei, 2011; Morris *et al.*, 2013), these two aspects are included in our conceptualization of *problem-solving creativity,* defined as the ability to find and implement original, useful, and cost-effective solutions to the internationalization-related problems that put the exploitation of an IO at risk. Since these skills derive from knowledge and information-based processes and thus they are not homogeneously developed, it is difficult for international entrepreneurs to show the same problem-solving effectiveness (Gruber *et al.*, 2015; Hilmersson *et al.*, 2021b). Therefore, they are seen as a competitive advantage for exploiting opportunities in new international markets (Mostafiz & Goh, 2018).

Entrepreneurial cognition theory

The entrepreneurial cognition theory (Mitchell *et al.*, 2002) helps to understand how international entrepreneurs think, how they discover IOs, and why they behave differently when faced with new IOs (Tabares *et al.*, 2021; Zahra *et al.*, 2005). Zucchella (2021, p. 4) argues that this theory could shed light on the "non-directly observable elements in the mind of the entrepreneurs like knowledge formation, judgment and evaluation, reasoning, and problem-solving." In this vein, entrepreneurial cognition theory characterizes the entrepreneur as a collection of unique information and knowledge that significantly impacts on his/her skills and behavior in the entrepreneurial process (Kuratko *et al.*, 2021). Accordingly, based on entrepreneurial cognition theory, scholars suggest that an entrepreneur's problem-solving ability varies while absorbing information and knowledge of markets (Chen *et al.*, 2018; Chen *et al.*, 2020).

As previously argued, we know that each IOR approach entails different behaviors for gathering market information. There are, in fact, differences in the knowledge accumulation about the IO and the facility to acquire new information about it depending on whether the IO was recognized purpose-

fully or serendipitously (Hilmersson & Papaioannou, 2015; Jones & Casulli, 2014; Oyson & Whittaker, 2015). For example, entrepreneurs who discover an IO based on active search tend to seek and acquire more do-main-specific information about the IO (Oyson & Whittaker, 2015). There-fore, a knowledge acquisition gap is created between IOs identified actively and those identified serendipitously. As problem-solving skills are knowledge and information-based, problem-solving speed and creativity in the IOD stage may be conditional on the information and knowledge the entrepreneur has generated during the IOR phase. Drawing on the entrepre-neurial cognition theory, we argue that heterogeneity in how entrepreneurs identify IOs, especially the unique form they develop the information and knowledge structures related to the IO, ultimately determines their ability to solve problems. Similarly, Bai *et al.* (2019) have demonstrated that differ-ences in the information and knowledge acquired about the IO lead to vari-ation in product-development skills.

Active IOR and problem-solving competence

When entrepreneurs purposefully identify IOs, they systematically search for information that entails having different knowledge sources, causing entrepreneurs to have extensive information necessary for IOR (Chetty *et al.*, 2018; Tuomisalo, 2019). This search for information would help entrepreneurs to discover the areas in which the IO may fall short. Thus, active IOR enables them to anticipate problems that may arise during the internationalization process and have some potential problem-solution pairs already predefined, facilitating the quicker implementation of solu-tions (Hilmersson *et al.*, 2021a; Vaghely & Julien, 2010). Furthermore, the information gathering consists typically not only of regular analysis of the international environment, but may also involve investigating the needs of international customers, examining and questioning the competitors, and/or maintaining technical dialogues with suppliers (Chandra *et al.*, 2015; Ciravegna *et al.*, 2014). Such external knowledge interaction may increase speed when solving problems during IOD since it reduces misunderstand-ings about customer problems, allows to have in mind a pool of possible solutions already implemented by competitors, and builds capabilities with-in specific areas (Bai *et al.*, 2018; De Clercq & Zhou, 2014). As such, the intense thought, planning, and information exposure and gathering expend-ed at the active IOR process can save time later on, supporting speedily development of the IO because information gained through active IOR can be recalled and projected in order to face the internationalization problems (Chandra *et al.*, 2009; Jones & Casulli, 2014).

Moreover, previous research has emphasized the bond between acquiring information and knowledge and being creative (Giampaoli *et al.*, 2017). Scholars emphasize that access to information and knowledge in the relevant domain benefits the generation of creative solutions (Chen *et al.*, 2018) The information and knowledge acquired through the active IOR can ensure a complete analysis and understanding of actions required to develop and exploit an IO (Hilmersson *et al.*, 2021a). Such early analysis and understanding may increase the likelihood of finding and implementing cost-effective and creative solutions (Chen *et al.*, 2018; Morris *et al.*, 2013). Additionally, through systematic search and international environment scanning, international entrepreneurs gain insight into the nature and context of the international market. This would allow them to improve the understanding of the solution trends demanded by the international customers, enacted by suppliers, and implemented by the competitors (Bai *et al.*, 2018, 2019), which may heighten the emergence of a great variety of valuable and fresh solutions. Therefore, we hypothesize as follows:

H1: *Active IOR is positively related to (a) problem-solving speed and (b) problem-solving creativity.*

Serendipitous IOR and Problem-Solving Competence

Serendipitous IOR usually occurs through the interpretation and reasoning of incomplete information or unusual situations in the international environment, implying that entrepreneurs have limited knowledge about the IO (Hilmersson *et al.*, 2021a; Kiss *et al.*, 2020). However, previous research suggests that despite the fact that entrepreneurs with serendipitous IOR predisposition do not have structured information about the IO (Crick & Spence, 2005; Kiss *et al.*, 2020), they could be well-skilled to solve problems that may arise during IOD since they will be likely to connect knowledge acquired in different contexts to implement solutions (Hilmersson *et al.*, 2021b; Mueller & Shepherd, 2016). Moreover, passive entrepreneurs are likely to predict some problems and imagine alternative solutions that their new IOs may face in advance (Chen *et al.*, 2020). Reinforcing this idea, previous research has argued that it would be expected that passive international entrepreneurs use the available disperse information about the IO to deliver timely solutions (Evers & O'Gorman, 2011) because they are framed in an impulsive and amorphous procedure that leads them to consider the scarce available information to make a decision (Kontinen & Ojala, 2011).

Besides, the openness in thinking of those international entrepreneurs leads to the development of new internal knowledge derived from the integration of new information with prior stock of knowledge (De Clercq *et al.*, 2012; Gruber *et al.*, 2015), which allows them to generate future-oriented innovative and creative ideas (Hilmersson *et al.*, 2021b). Such openness also leads to an heterogeneity of "thought worlds," which may increase the possibility to foresee novel solutions that could be rapidly implemented during IOD (Autio *et al.*, 2013). Scholars have also shown that entrepreneurs who discover IO serendipitously rely more on available means to develop and exploit IOs (Long *et al.*, 2017; Stenholm & Renko, 2016). This suggests that when problems arise during IOD, they react with low-cost, creative, and quick solutions (Chandra *et al.*, 2015). From the above discussion, we hypothesize as follows:

H2: *Serendipitous IOR is positively related to (a) problem-solving speed and (b) problem-solving creativity.*

Differences between IOR Perspectives and Problem-Solving Competence

We expect international entrepreneurs who recognize IOs to purposefully solve problems faster than international entrepreneurs that discover IOs serendipitously for several reasons. First, active IOR is likely to entail the occurrence of problems and solutions known or anticipated beforehand. Thus, during active IOR, entrepreneurs usually forestall the problems related to their IO and have solution "templates" that accelerate solution implementation (Hilmersson *et al.*, 2021a; Hohenthal *et al.*, 2003). In serendipitous IOR, international entrepreneurs at most can predict some problems that may be faced (Oyson & Whittaker, 2015). This is because they are open to new and unconventional ways of expanding internationally that usually result in problems unknown beforehand and, consequently, require more thought-time that slows down problem-solving (Crick & Spence, 2005; Hilmersson *et al.*, 2021b).

Second, previous research postulates that, unlike international entrepreneurs that deliberately searched, those who accidentally discovered IOs had minimal thoughts or plans about such IO. Thus, in serendipitous IOR, the interpreting and problem-solving process occur after new information from foreign markets is encountered, while in active IOR, this process has already occurred earlier when searching for the IO (Chandra *et al.*, 2009; Jones & Casulli, 2014). Third, the initiatives based on IOs identified through activeness tend to be developed more quickly (Ciravegna *et al.*, 2014), which would suggest that problems are also solved more quickly. In

part, this is explained from the point of view that serendipitous IOR generates too many ideas and solutions compared to the active IOR (Fiet & Patel, 2008), which hinders the right solution's choice and thus slows down problem-solving speed. Formally stated:

H3: *Active IOR is stronger related to problem-solving speed than serendipitous IOR.*

On the contrary, we expect international entrepreneurs who discover an IO through serendipity to solve problems more creatively than international entrepreneurs who discover an IO purposefully. When identifying IOs actively, entrepreneurs are embedded in convergent thinking that leads them to order the collected information logically and stock predefined and unambiguous problem-solution routines or "templates" (Hilmersson *et al.*, 2021a; Vaghely & Julien, 2010). This may affect the degree of novelty of the implemented solutions as it does not stimulate creativity (Hilmersson & Papaioannou, 2015). On the other hand, entrepreneurs that identify IOs serendipitously possess an idiosyncrasy that fosters imaginative and unconventional thinking through the connection of knowledge originated in different contexts and the openness in their thinking (Mueller & Shepherd, 2016) that may allow them to generate and implement original and unique ideas that lead to new problem-solution pairs (Hilmersson & Papaioannou, 2015; Vaghely & Julien, 2010). Therefore, they are embraced in divergent thinking with relaxed search standards, which is recognized as a key cognitive ability to generate creative problem-solving ideas (Chen *et al.*, 2018).

Furthermore, opportunities recognized through serendipitous IOR are associated with more profitable opportunities than opportunities identified through activeness (Dahlqvist *et al.*, 2004), suggesting that the solutions implemented to the problems that arise on serendipitous discovered IOs would have lower-cost solutions. This idea is reinforced from the point of view that entrepreneurs with serendipitous IOR predisposition generally rely on available resources to develop the IO, which may fuel the implementation of creative and lower-cost solutions during IOD (Kiss *et al.*, 2020; Long *et al.*, 2017; Stenholm & Renko, 2016). Thus, we hypothesize as follows:

H4: *Serendipitous IOR is stronger related to problem-solving creativity than active IOR.*

The moderating role of PNE

PNE, as an entrepreneurial failure, is understood as the cessation of participation (closure/sale/failure) in a venture because it has not met the entrepreneur's expectations (Hessels *et al.*, 2011; Klimas *et al.*, 2021; Ucbasaran *et al.*, 2009). The knowledge and skills needed to lead an internationally oriented company are at least partially experiential in nature (Lafuente *et al.*, 2019). Indeed, in line with the premises of the entrepreneurial cognition theory, which promulgates that the nature of prior experience may affect entrepreneurs' mindset, scholars have pointed out that entrepreneurs with PNE show different knowledge, behaviors, and skills in comparison with those without PNE (Hessels *et al.*, 2011; Lafuente *et al.*, 2019; Ucbasaran *et al.*, 2013). PNE has dichotomous effects on entrepreneurs, i.e., either positive or negative (Dias & Teixeira, 2017; Walsh & Cunningham, 2017), and thus has the potential to influence subsequent entrepreneurial opportunities (Amankwah-Amoah *et al.*, 2018; Hessels *et al.*, 2011).

One research stream argues that PNE provides entrepreneurs a rich experience, knowledge, and understanding (cf. Eggers & Song 2015). Experiencing a failure may enrich entrepreneurs' cognitive schemas and thus prompt the supplement, improvement, or development of diverse types of skills that can be applied in subsequent IOs (Lafuente *et al.*, 2019). Indeed, Hessels *et al*. (2011) claim that entrepreneurs who experience a failure possess more relevant skills than those who did not, for example, a greater likelihood of exploiting more innovative opportunities (Ucbasaran *et al.*, 2009). On the contrary, other research stream claims that failure may harm entrepreneurs' behaviors and skills (Klimas *et al.*, 2021; Ucbasaran *et al.*, 2013). For example, Shepherd (2003, p. 319) stated that PNE "inhibits cognitive processes, restricts decision making, and limits the number of options considered" since entrepreneurs who have experienced a failure feel grief, which is a negative emotional response that disrupts their abilities and behavior (see also Klimas *et al*. 2021).

From this discussion, we argue that PNE may affect the relationship between IOR and problem-solving skills. Although active IOR provides the opportunity to anticipate problems and implies some predefined ideas (Hilmersson *et al.*, 2021a), such ideas to solve future problems during IOD may have a different value for international entrepreneurs with and without PNE. Active entrepreneurs without PNE are more likely to have greater relative confidence in their knowledge to make faster decisions since they tend to repeat the same actions and strategies over time (De Clercq *et al.*, 2012; Hilmersson & Papaioannou, 2015). Thus, entrepreneurs without PNE

may integrate knowledge in more meaningful ways as they have lesser perceived risk and uncertainty of international markets (Vaillant & Lafuente, 2019). By contrast, active entrepreneurs with PNE may be more likely to see problems less controllable, believe that there are scarce solutions, and have doubts about their ability to solve them (Lyubomirsky & Nolen-Hoeksema, 1995). Therefore, PNE may decrease entrepreneurs' audacity, weakens their risk-taking propensity (Lafuente *et al.*, 2019), and slows down their decisions and behaviors (Acedo & Jones, 2007; Klimas *et al.*, 2021). PNE leads international entrepreneurs to implement new strategies and actions in a "not to do the same" attitude (Lafuente *et al.*, 2019) and thus developing more creative solutions and becoming more cost-efficient (Hilmersson & Papaioannou, 2015; Sung & Choi, 2012).

Hence, we can argue that active international entrepreneurs with PNE are more likely to slow down their solutions than active international entrepreneurs without PNE, as they have less self-efficacy and confidence in their knowledge. We can also claim that active international entrepreneurs with PNE are more likely to apply creative solutions than active international entrepreneurs without PNE, since failure encourages international entrepreneurs to become more cost-efficient by applying the acquired knowledge about the international market into developing innovative ideas. Therefore, we posit the following hypotheses:

H5: *PNE (a) negatively moderates the relationship between active IOR and problem-solving speed, while (b) positively moderates the relationship between active IOR and problem-solving creativity.*

As opposed to passive international entrepreneurs with PNE, those without PNE are better able to take impulsive and amorphous decisions using the scarce available information they possess (Evers & O'Gorman, 2011; Kontinen & Ojala, 2011), which may help them to implement timely solutions. Furthermore, the lack of a PNE (which can be seen as a success) makes passive international entrepreneurs more confident in their skills and knowledge (De Clercq *et al.*, 2012). On the contrary, entrepreneurs with turbulent foreign operating experience and a lack of international market knowledge make slower decisions regarding the internationalization of their business (Casillas *et al.*, 2009; Chandra *et al.*, 2020). Similarly, it is reasonable to think that entrepreneurs with PNE that fortuitously recognized an IO will proceed more slowly and cautiously during problem-solving.

When facing a problem during the IE process, PNE may warn international entrepreneurs about the potential problems associated with operating

overseas and cause them to see international markets with even more uncertainty and ambiguity (Boso *et al.*, 2019; Crick & Spence, 2005). As such, PNE could lead to a feeling of lack of comfort and adjustment to challenges in the international market, causing that problems can be magnified and that entrepreneurs have less reliance on their skills and to be more risk-averse, which in turn will delay problem-solving (Acedo & Jones, 2007; Muzychenko & Liesch, 2015). Hence, passive international entrepreneurs with PNE will search intensively for more information to solve problems than those without PNE, and thus they will spend more time implementing solutions. In other words, while passive international entrepreneurs can generate a large number of solutions, passive entrepreneurs that have suffered a failure experience are shocked into a state of reflection when facing a problem in their new IO that leads them to invest considerable time and effort to fully implement a solution.

On the other hand, the failure experience could serve as a knowledge reservoir that leads international entrepreneurs to shape their behaviors, skills, and routines and encourage them to do things more creatively than in their previously failed business (Amankwah-Amoah *et al.*, 2018). Thus, PNE may lead international entrepreneurs to deep their divergent thinking and reach more richly linked constellations of memory (Mueller & Shepherd, 2016) and, consequently, imagine higher innovative ideas for avoiding making the same mistakes (Yamakawa & Cardon, 2015). Indeed, PNE could help to limit the tendency to make wasteful or excessively risky resource allocation, and therefore to implement increasingly cost-efficient solutions stimulating creative problem-solving during IOD.

From the above reasoning, first, we postulate that the problem-solving speed of passive entrepreneurs with PNE is lesser than those without PNE, as they rely less on their scarce available information. Second, the reverse might be expected for problem-solving creativity: i.e., we expect that the problem-solving creativity of passive entrepreneurs with PNE is greater than those without PNE, since failure inspires entrepreneurs to do things cost-efficiently and creatively to avoid a new failure. Formally stated:

H6: *PNE (a) negatively moderates the relationship between serendipitous IOR and problem-solving speed, while (b) positively moderates the relationship between serendipitous IOR and problem-solving creativity.*

Our conceptual model is displayed in Figure 1.

Research method

Research context and data collection

The data for this study was collected in Spain. Specifically, the research focuses on international entrepreneurs located in Andalusia, a Southern Spanish region. As recommended by previous studies (e.g., Acedo & Jones, 2007), we restrict our research to a regional context because we mitigate the risk of uncontrolled external and environmental elements influencing the research. Several reasons make Andalusia particularly suitable for this study. First, Andalusia shows an increase in exports per capita and the ratio of exports to GDP (Fernández-Serrano & Romero, 2014), which has reached 19.3% in 2019 (Andalusian Agency of Foreign Promotion, 2021). Thus, Andalusia became the second-largest export autonomous community of Spain in 2019, accounting for almost 11% of the country's total (Spanish Institute for Foreign Promotion, 2020).

Second, according to the Andalusian Agency of Foreign Promotion (2021), only during 2019, 1,469 Andalusian companies began to export their products, with a total amount of 25,576 firms. Third, these indicators have been accompanied by a great, recent interest in studying entrepreneurial and internationalization activity in Andalusia at the individual and company levels (e.g., Cardenete & Garcia-Tapial, 2019; Moral-Pajares *et al.*, 2015). Indeed, studies have pointed out that Andalusian international entrepreneurs show high international market orientation, high levels of proactivity, and an upgrading in their entrepreneurial skills (Acedo & Jones, 2007; Moral-Pajares *et al.*, 2015). These facts show that the Andalusian foreign sector is dynamic and that many of these achievements are mainly due to the skills development and the involvement of international entrepreneurs who have become relevant agents in the international expansion of this region.

For data collection, we follow the approaches of prior literature that recommend not to restrict the contact of international entrepreneurs to only one data source (cf. Murnieks *et al.*, 2020). In this vein, we used multiple channels (i.e., Andalusian business incubators, Andalusian export company associations, and the Andalusian Agency of Foreign Promotion) to create our own database for this study. The resulting combined database contained 2,164 entrepreneurs, who were contacted either by phone, by e-mail or physically. Of those, 53.9% (1,167) were discarded, as they either expressed no interest or insufficient experience/knowledge to participate in the study or it was impossible to contact them (they did not respond to calls, had closed their businesses, or had changed/closed their e-mail ac-

counts). As suggested by previous research, the questionnaire was administered to owner–managers of active internationalized firms (e.g., Bolzani & Foo, 2018).

To ensure that the participants are international entrepreneurs, we established as sampling criteria that we will only consider entrepreneurs who are currently pursuing (developing) an opportunity in the international market. Accordingly, our final target sample was 997 international entrepreneurs who were asked by e-mail to complete an online self-administered questionnaire developed with Google Forms software. Two weeks and four weeks after the initial survey mailing, a reminder e-mail was sent to non-respondents. We realized the data collection between June 22 and October 11, 2020. We received 174 filled questionnaires. We next refined our sample by checking the knowledgeability about the topics and consistency of respondents' attitudes in the questionnaire by applying two control questions. We removed 2 respondents from the sample, one because inconsistency in the responses and the other for both reasons, i.e., low knowledgeability and inconsistency in the responses. Thus, we obtained 172 usable surveys, representing an effective response rate of 17.3%. Furthermore, to ensure that non-response bias is not a problem in our study, we compared the answers of the 15 early and the 15 late respondents by applying a series of t-tests (Armstrong & Overton, 1977). The results confirmed that there exist no significant differences and, therefore, non-response bias is not a problem in this study.

Furthermore, with the help of G*Power software (Memon *et al.*, 2020), we assessed if our initial sample size (n = 172) meets the minimum required to achieve the desired level of statistical power. Given that the most complex regression in our hypothesized model has two predictors, and assuming a medium effect size of 0.15 and a power of 0.80 being alpha 0.05, a minimum sample size of 68 individuals is required. Consequently, our final sample highly exceeds the minimum required. As for the respondents' characteristics, 102 individuals (59.3%) were men and 70 (40.7%) women, and the average age of respondents was 42 years. 6.9% of those surveyed had a second-level education (secondary school), 48.3% had a third-level education (university degree), and 44.8% had a fourth-level education (postgraduate degree). It is also worth noting that the entrepreneurs represent nine different industries and that 42.4% (n = 73) of those acknowledged that they had a PNE.

Measures and questionnaire design

The survey consisted of 36 questions divided in three sections. The first section served as an introduction to the survey and established a question in which participants had to give their consent to participate in the study. Section two contained 25 questions referred to the main variables of the study (i.e., international opportunity recognition, problem-solving skills) and to a variable that was used as marker variable, as well as two control questions. Finally, the third section includes 10 questions about socio-demographic and previous experience factors of respondents.

The survey was initially designed in English based on adaptations of previously validated scales. Then, it was translated into Spanish, as this is the mother tongue of the respondents. Once translated, the questionnaire was judged by an expert panel consisting of five international entrepreneurs and six scholars. Following the experts' suggestions, minor adjustments were made to adapt the instrument to the study context. As a final step, the survey was back-translated to English, and no differences that affect the nature of the original scales were found. The majority of items were measured as closed questions using a seven-point Likert scale (1 = totally disagree to 7 = totally agree) except for those questions where respondents were required to respond either positively or negatively (e.g., if they have had any negative entrepreneurial experience in the past) or where they were required to express a specific response (e.g., their age in years). Table 1 contains a detailed list of the main variables and items used in this study.

International opportunity recognition. To measure active and serendipitous IOR, we adapted previous scales developed by Kuckertz *et al*. (2017), Lorenz *et al*. (2018), and Nicolaou *et al*. (2009) to our context. *Active IOR* was measured utilizing six items that capture the rigid planning to find relevant information about the international market, the deliberate investment in time and resources, and the attempt to scan the international market constantly. *Serendipitous IOR* was measured with five items that capture the spontaneous emergence of an IO, lack of intentionality to identify an IO, and the sensitivity and alertness to discover an IO in moments of insight.

Problem-solving speed and Problem-solving creativity

The measure of these two constructs was assessed by adapting the scales developed by Atuahene Gima and Wei (2011). Focusing on problems that international entrepreneurs encounter during IOD, *problem-solving speed* was measured with four items that address the quickness in finding and

implementing solutions, and *problem-solving creativity* was measured with four items, which reflect the cost-effectiveness and novelty of the solutions.

Past negative entrepreneurial experience. As in previous studies (e.g., Lafuente *et al.* 2019), to measure PNE respondents reported whether they have (yes or no) any negative entrepreneurial experience in the past (e.g., closure/sale/failure of a business whose performance was too low to the entrepreneur's expectations).

Control variables. We included five control variables in the study; which are, gender (1 = female; 2 = male), educational level (five levels), age (in years), international business experience (1 = yes; 2 = no), and PNE severity (number of times the entrepreneur has had negative entrepreneurial experiences). Our logic was that these five variables have previously been recognized as relevant for explaining possible sources of variation when studying entrepreneurial and internationalization behavior (Murnieks *et al.*, 2020; Shepherd *et al.*, 2015; Wach & Głodowska, 2021).

Data analysis approach

PLS-SEM was used to conduct the data analysis (Henseler *et al.*, 2009). Several arguments justify the use of this technique in our study. First, PLS is appropriate when the research is concerned with predicting more than one dependent variable (Hair *et al.*, 2019). Second, since PLS is based on bootstrapping techniques, it provides more realistic inferences (Rigdon, 2016), making it particularly preferable to study previously unproven relationships. As the third argument, PLS-SEM, compared to covariance-based structural equation modeling (CB-SEM), usually produces smaller structural coefficients, thus providing more secure hypothesis testing in less studied contexts such as Andalusia (Reinartz *et al.*, 2009). For the estimation method, Mode A (reflective measures) was selected since its usage is suggested when correlated items are expected (i.e., the items of a scale are interchangeable) (Jarvis *et al.*, 2003) and because a relationship is expected to occur from the construct to the indicators (Diamantopoulos & Winklhofer, 2001). The software used to carry out the analysis was SmartPLS 3.3.

Common method bias

Common method bias (CMB) could be a problem in survey-based studies when the same respondent answers independent and dependent variables. Therefore, we took some procedures to avoid and control for CMB. First, we applied various remedies recommended by MacKenzie and Podsakoff (2012) to mitigate CMB from the very design phase of the survey

(e.g., pretest the questionnaire, guarantee participants anonymity, ask participants for honesty, ensure participants knowledgeability). Second, once the data was collected, we applied the measured latent marker variable (MLMV) technique to detect and control CMB, which is recognized as the only effective statistical remedy for that purpose (Chin *et al.*, 2013). The basis of the MLMV is that it should be from a different unit of analysis and a different domain than the variables included in the hypothesized model. Thus, to control for CMB, we included the organizational exhibitionism scale developed by Hamedoglu and Potas (2012) as MLMV. Carrying out the mentioned analysis, we can argue that the CMB is not a problem in our research, since the results obtained after the inclusion of the MLMV show that (1) the model presents a worse fit than the original model and (2) that the path coefficients do not show significant differences between them and are consistent with the original estimates.

Results

Measurement model assessment

As we used Mode A (reflective measures) as estimation method, first, well-established traditional measures should be applied to evaluate the measurement model's internal consistency, reliability, and validity (Hair *et al.*, 2019). All indicator loadings are above the minimum limit suggested in the literature of 0.707 (Carmines & Zeller, 1979), and thus, individual item reliability is considered satisfactory. Regarding Cronbach's Alpha and composite reliability (CR), all variables have values between 0.70 and 0.95, which are the minimum and maximum values respectively to take into consideration (Hair *et al.*, 2019; Nunnally, 1978). Besides, the AVE of all variables is above the 0.50 cut-off level, which confirms the convergent validity of our measurements (Fornell & Larcker, 1981). Table 1 shows all these values. Discriminant validity was evaluated through the Heterotrait-Monotrait Ratio (HTMT) 0.85 criterion (see Table 2), which is stricter in comparison with other discriminant validity measures such as cross-loadings and Fornell-Larcker criterion (Henseler *et al.*, 2015). The results obtained through all these measures confirm the validity of our measurement model and therefore we can proceed to evaluate the structural model.

Structural model assessment

To start evaluating the structural model, we must first look at the global adjustment model calculated by the Standardized Mean Square Residue (SRMR). Our model attains an SRMR of 0.063, a value that is below the recommended maximum limit of 0.080, and therefore means that our model has an appropriate fit (Hu & Bentler, 1999). From here, we evaluate the structural model by examining the sign, size, and meaning of the structural path coefficients and the f^2, which allow the assessment of the relationships' statistical significance. 10,000 resamples (bootstrapping technique) were utilized to generate t-statistics to evaluate the statistical significance of the path coefficients.

As displayed in Table 3, three of the first four hypothesized relationships are supported, that is, H1a, H1b, and H2b. However, H2a is not supported, as serendipitous IOR shows an extremely low f^2, under the minimum level of 0.02. Thus, serendipitous IOR and PS speed are not associated. It should also be noted that H1a and H2b show a strong effect size, while H1b shows a weak effect size (Cohen, 1988). Additionally, to estimate H3 and H4, we applied the approach proposed by Rodríguez-Entrena *et al*. (2018), which examines whether the estimates of two parameters have significant differences between them. In this regard, H3 and H4 are supported, which confirms our supposition that active IOR possesses a significantly greater effect on problem-solving speed than serendipitous IOR. On the contrary, serendipitous IOR possesses a significantly greater effect on problem-solving creativity than active IOR.

Furthermore, the R^2 and the Q^2 values were examined to assess the predictive relevance of our model. Our hypothesized model appears to possess suitable predictive power (in-sample prediction) for both endogenous variables. Indeed, PS speed ($R^2 = 0.433$) and PS creativity ($R^2 = 0.384$) show a moderate R^2 significance (Henseler *et al.*, 2009). Likewise, when analyzing our research model's predictive performance (out-of-sample prediction), our model seems to possess an adequate predictive performance by calculating Q^2 values through PLS predict (PS Speed – $Q^2 = 0.314$; PS creativity – $Q^2 = 0.268$), suggesting that our model can predict exact values for individual cases (Evermann & Tate, 2016). Moreover, it should be noted that none of the five control variables have significant effects over the dependent variables and therefore are not sources of variation. Indeed, by including only the control variables in a model, we confirm that none of them unfold significant effects and generate rather weak R^2 values (0.050 for PS speed and 0.056 for PS creativity).

Finally, we conducted a multi-group analysis (Henseler & Fassott, 2010) to test the moderating effect of PNE on the relationships included in our hypothesized model. Consequently, we split the sample into two groups, international entrepreneurs with (n = 73) and without (n = 99) PNE.

Before comparing path estimates across groups, it is necessary to examine the measurement invariance of composite models (MICOMs). In this way, it can be assured that the effect of the intensity of PNE as a moderating variable is limited to the path coefficients of the structural model and not to the parameters of the measurement model. Thus, we apply the three-step procedure (i.e., (1) configural invariance, (2) compositional invariance, and (3) an assessment of equal variances and means) to examine the MICOMs when using PLS (Matthews, 2017). As Table 4 shows, the full measurement invariance of both groups was achieved for all variables.

Consequently, we next applied a non-parametric approach, the permutation-based procedure, to conduct multi-group analyses through the evaluation of the differences between the path coefficients of two groups (Chin & Dibbern, 2010). The advantage of this technique is that it is not based on distribution assumptions, but on a rough randomization test in which a subset of all possible data permutations between groups is made. In the permutation-based method, only a *p*-value of the differences between the path coefficients lower than 0.05 at the 5% level indicates the existence of significant differences in the two groups, and thus it is the most reliable method to conduct multi-group analyses (Chin & Dibbern, 2010; Hair *et al.*, 2018). As Table 4 illustrates, there exist significant differences in two of the four direct effects on which moderation hypotheses were postulated. H5a and H5b are statistically supported, while H6a and H6b are not supported. Therefore, PNE moderates the relationships between active IOR and problem-solving skills but does not affect the relationships between serendipitous IOR and problem-solving skills. Path coefficients, significance level, and R^2 of each subsample are displayed in Figure 2.

Discussion

We undertook this study to advance the IE literature by examining the relationship between IOR and problem-solving competence. In particular, we pay special attention to whether the two IOR approaches (i.e., active IOR and serendipitous IOR) differently influence problem-solving speed and creativity and, thus, if they are a source of heterogeneity that explains why some international entrepreneurs solve problems that arise during IOD faster and more creatively. Moreover, we analyzed whether PNE may be

a source of differentiation that moderates the relationship between IOR styles and problem-solving skills. Our findings, apart from having relevant theoretical contributions to the literature, also have managerial implications.

Theoretical implications

As the first contribution, this study adds empirical evidence that confirms that the way an entrepreneur recognizes an IO (actively versus serendipitously) differently affects the development of the IO (cf. Ciravegna *et al.*, 2014; Zhou, 2007). In particular, we offer initial insights on how active and serendipitous IOR influence entrepreneurs' problem-solving competence for IOD. Active IOR was found to be positively related to both problem-solving speed and creativity, while serendipitous IOR has a positive relationship to problem-solving creativity. Additionally, we found that serendipitous IOR is more highly related to problem-solving creativity than active IOR, and on the contrary, that active IOR has a greater positive relationship with problem-solving speed than serendipitous IOR. Indeed, although serendipitous IOR does have a positive relationship with problem-solving speed, this relationship is not significant.

The dynamic nature of the foreign market suggests that to compete effectively is vital to overcome the challenge and criticality of rapidly developing the IO materialization process (Acedo & Jones, 2007). As such, the positive effect of active IOR on problem-solving speed brings new evidence on the relevance of information gathering as a determinant for the rapid development of IOs. Thus, this result aligns somewhat with previous beliefs that IOs recognized by activeness have a faster implementation and internationalization (Ciravegna *et al.*, 2014) than those recognized by serendipity which takes longer to be materialized and internationalized (De Clercq *et al.*, 2012; Zhou, 2007). With our findings, we offer a possible explanation for this phenomenon, as it seems that in serendipitous IOR, the problems that appear take longer to be solved by international entrepreneurs, which will result in a later implementation of the IO. Indeed, regarding the non-relationship between serendipitous IOR and problem-solving speed, it appears that the limited knowledge about the IO prevents problems that arise from being solved quickly. This finding contradicts previous postulations that affirm that entrepreneurs that recognized IOs serendipitously use the scarce available information to make timely decisions (Evers & O'Gorman, 2011; Kontinen & Ojala, 2011). However, it is in line with prior research suggesting that entrepreneurs that recognized IOs serendipitously need more thought time to encounter new information from foreign

markets before selecting the right solution (Chandra *et al.*, 2009; Hohenthal *et al.*, 2003) which slowdowns problem-solving process.

Thus, our findings yield the paradox that while serendipitous discovery accelerates the recognition of IOs (Crick & Spence, 2005), it appears that for IOs identified in this way, international entrepreneurs will take longer to find and implement solutions to IO development and exploitation related problems. Instead, while identifying an IO through activeness takes time and effort, solving problems that arise in these opportunities will be faster. Ultimately, these findings imply that identifying IOs in one way or another condition the speed of problem resolution, impacting international opportunity exploitation and firm performance (Giampaoli *et al.*, 2017).

Regarding problem-solving creativity, even if we found it to be positively related to both active and serendipitous IOR, serendipitous IOR is a better predictor of implementing creative solutions, which aligns with our prior reflections. Serendipitous IOR leads entrepreneurs to an open-ended approach to problem-solving, which indeed is better suited to this end by enabling analogical reasoning processes and the connection of knowledge originating in different contexts (Mueller & Shepherd, 2016). Although entrepreneurs with an active IOR predisposition may generate a list of possible "new to the firm" solutions based on their systematic search on international markets, the solutions they apply will usually be based on predefined problem-solution pairs with limited creativity (Atuahene-Gima & Wei, 2011; Vaghely & Julien, 2010). Our findings support the view that the relaxed standards of serendipitous discovery will allow international entrepreneurs to arrive at new problem-solution pairs, as they possess an imaginative and unconventional way of thinking that leads to generating original and unique ideas (Hilmersson & Papaioannou, 2015; Vaghely & Julien, 2010). Likewise, creative problem-solving does encompass not only the originality and novelty of the implemented solutions but also the fact that these are cost-efficient (Atuahene-Gima & Wei, 2011). Our findings add to the literature that suggests that entrepreneurs that have recognized an IO serendipitously tend to implement lower-cost ideas, as they are more likely to use the available resources to materialize their business opportunities (Hilmersson *et al.*, 2021b; Stenholm & Renko, 2016).

Does PNE matter? As a second contribution, our findings reveal that the nature of the past experience of international entrepreneurs plays a role in some of the proposed relationships. In particular, the problem-solving speed of active entrepreneurs decreases when they have suffered a PNE, but their problem-solving creativity increases. These findings confirm that PNE has dichotomous effects on entrepreneurs, either positive or negative (cf. Dias & Teixeira, 2017; Walsh & Cunningham, 2017). Concerning

problem-solving speed, our results agree with Shepherd (2003) and La-fuente *et al.* (2019) as PNE will lead to a lack of confidence and risk-taking propensity that inhibit the use of knowledge acquired during active IOR limiting the number of solutions considered and thus lengthening solution implementation. Regarding problem-solving creativity, the PNE will have the opposite effect as it will intensify the use of acquired knowledge to find and materialize more innovative solutions (Ellis *et al.*, 2006; Lafuente *et al.*, 2019). Hence, our results suggest that PNE does not have a unique impact on entrepreneurs' skills. In this study, we can conclude that PNE harms skills that involve a lack of reflection, such as having to take action quickly, and that it will have a positive effect on skills that involve more reflection, such as creativity.

In the case of passive international entrepreneurs, having a PNE does not influence the relationship between serendipitous IOR and problem-solving competence. Although there are slight differences between the two groups considered, the effect is not statically significant. We offer an ex-post explanation for such a non-relationship. The result may indicate that in fortuitously identified IOs, the impact of prior experience-based factors regarding entrepreneurs' skills is not sound (Yamakawa & Cardon, 2015). Thus, the finding could be explained from the point of view that in seren-dipitously discovered IOs, there is already plentiful uncertainty, ambiguity, and risk aversion (Casillas *et al.*, 2009; Chandra *et al.*, 2020; Chandra *et al.*, 2015) that even if entrepreneurs have suffered a PNE, it does not add even more turbulence to their thinking. In this way, it appears that identifying IOs through serendipity will make international entrepreneurs implement solutions slowly and cautiously enough and use divergent thinking and available resources to deliver novel and cost-efficient solutions.

Conclusions

Drawing on opportunity identification and entrepreneurial cognition theories, this study provides new insights into the IOR process and its effects by examining if the way entrepreneurs recognize an IO (actively or serendipitously) differently influences entrepreneurs' problem-solving speed and creativity. Moreover, we have analyzed if PNE plays a moderating role in these relationships. Using data from 172 Spanish international entrepreneurs, we have found that active IOR is positively related to problem-solving speed and creativity, while serendipitous IOR has a positive relationship solely with problem-solving creativity. Furthermore, we have demonstrated that entrepreneurs with an active IOR predisposition solve

problems faster than their passive counterparts, but that on the contrary, entrepreneurs with a serendipitous IOR predisposition solve problems more creatively. Additionally, we have found that PNE can act as a moderator by decreasing the impact of active IOR on problem-solving speed but increasing the impact of active IOR on problem-solving creativity. Regarding serendipitous IOR, having or not a PNE does not moderate its relationship with either problem-solving speed or creativity. In short, our findings suggest IOR styles and PNE as sources of heterogeneity for entrepreneurs' problem-solving skills.

Managerial implications

Our study offers several managerial implications for international entrepreneurs. They should be acknowledged that identifying IOs actively or serendipitously will differently influence their problem-solving competence. Likewise, the fact of having a PNE may influence their problem-solving competence. Regarding problem-solving speed, they should be aware that in actively identified IOs they will be prone to solve problems faster, which could translate into faster implementation of the IO and, therefore, to being more competitive in the international market. Those entrepreneurs who actively identify IOs possess relevant market information that allows them to anticipate a series of solutions to address future problems, thus speeding up their response to these difficulties. Thus, our findings justify the resources that international entrepreneurs invest in acquiring knowledge to identify an IO deliberately, for example, through international market research. However, international entrepreneurs or the firms where they operate must consider that having suffered an entrepreneurial failure will decrease the quickness of problem-solving since it will reduce the confidence international entrepreneurs have in the information they hold. Likewise, entrepreneurs who have recognized an IO serendipitously should be aware that they will require more thought effort and time to acquire new information before solving the problems that arise, irrespective of whether or not they have suffered a PNE. Therefore, they should bear in mind that serendipitous IOs will take longer to materialize. Indeed, this additional time needed could jeopardize new venture survival and/or company performance.

Regarding problem-solving creativity, international entrepreneurs or the firms for which they work should notice that whether they discover IOs actively or serendipitously, they will be able to solve the problems that arise creatively. However, if IOs are discovered fortuitously, there will be a greater tendency to implement innovative solutions. The openness in

thinking of these international entrepreneurs will help them weave together ideas from diverse contexts to generate and materialize novel solutions, resulting in developing a more cost-effective and market-attractive IO. At a certain point, though, active entrepreneurs can implement creative solutions. If they slightly relax their clear guidelines and rigid criteria for IOR and are exposed to certain additional information, they will expand their level of innovative idea creation. Indeed, if active entrepreneurs have suffered a PNE, they will be more prone to generate and implement more novel and cost-effective solutions because this will break their fixedness in thinking.

Limitations and future research

We highlight some limitations of our study that open opportunities for further research. First, as our research is focused on a sample of international entrepreneurs from southern Spain, the generalizability of our results is limited. Thus, it will be interesting to replicate this study in other countries and even in other cultural contexts to provide further robustness to our findings. Second, given that we used cross-sectional data in this study, we cannot provide any definitive conclusions regarding causality. Consequently, further research using longitudinal data and cross-lagged analysis would help predict the development of entrepreneurs' problem-solving skills over time and enhance our understanding of the interrelationships between variables. Third, although we recognize that PNE moderates the relationship between active IOR and problem-solving skills, it does not moderate the relationship between serendipitous IOR and problem-solving competence. Future studies will be fruitful to examine if other factors (preferably experience-based factors) moderate such relationships.

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Acknowledgments

Annex

Table 1. Survey items and measurement model evaluation

Construct/items	Weight	Loading	α	CR	AVE
Please indicate your level of agreement with each of the following statements regarding the identification of the business opportunity that you are currently pursuing (developing) in the international market.					
Serendipitous international opportunity recognition (SIOR) (reflective)			0.903	0.928	0.721
I had a "state of alert" or special sensitivity to detect the opportunity in the international market	0.260*	0.879*			
It is difficult to explain how I came up with the international business idea; it just came to me spontaneously	0.234*	0.828*			
I got the international business idea from conversations with other people	0.192*	0.774*			
I had the intuition to identify the opportunity in the international market	0.250*	0.886*			
Although it was not my intention, I identified the opportunity to initiate a new business in the international market	0.238*	0.874*			
Active international opportunity recognition (AIOR) (reflective)			0.916	0.933	0.704
I researched international markets to identify the business opportunity through an organized/methodical process	0.181*	0.795*			
I intentionally searched for customer needs for which I have developed a solution subsequently	0.195*	0.834*			
In the search for the international opportunity, I took my time	0.164*	0.770*			
I examined and questioned existing solutions (own and/or competitors') in a purposeful way to generate a new international business idea	0.218*	0.884*			
I looked for information to generate new ideas for products or services focused on the international market	0.208*	0.847*			
I regularly analyzed the international environment to find a business opportunity	0.220*	0.898*			

Table 1. Continued

Construct/items	Weight	Loading	α	CR	AVE
Refer to those moments when you have experienced international market-related problems (i.e., problems during the internationalization process), during the development of the business opportunity that you are currently pursuing in the foreign market (i.e., after having identified the opportunity in the international market) and indicate your degree of agreement with the following statements					
Problem-solving speed (PSS) (reflective)			0.885	0.921	0.744
I believe I was quick to define, find, and implement solutions to the problems that arose in the international market	0.297*	0.847*			
I quickly came up with different alternative solutions for each problem that arose in the international market	0.293*	0.892*			
I usually found and implemented at appropriate times an appropriate number of alternative solutions to the problems that arose in the international market	0.293*	0.876*			
For every problem found in the international market, I had many solutions	0.276*	0.836*			
Problem-solving creativity (PSC) (reflective)			0.874	0.913	0.724
The solutions I found and implemented for the problems that arose in the international market were cost-efficient	0.249*	0.816*			
The solutions to the problems that arose in the international market were usually innovative and original	0.343*	0.871*			
I usually found solutions for these problems that had a lower cost than expected	0.284*	0.862*			
In general, I found and applied creative solutions to the problems that arose in the international market	0.295*	0.855*			

Note: * Significant at the 1% level.

Table 2. Discriminant validity (HTMT)

	1.	2.	3.	4.
1. Serendipitous IOR				
2. Active IOR	0.392			
3. Problem-solving speed	0.213	0.724		
4. Problem-solving creativity	0.657	0.075	0.264	

Table 3. Structural model results

Hypothesis	Impact of	On	Path coefficient	t-value	f^2	Hypothesis supported
H1a+	Active IOR	PS speed	0.675	12.571***	0.702	Yes
H1b+	Active IOR	PS creativity	0.183	2.565**	0.047	Yes
H2a+	Serendipitous IOR	PS speed	0.055	0.875	0.005	No
H2b+	Serendipitous IOR	PS creativity	0.661	11.486***	0.620	Yes
H3	Active IOR > Serendipitous IOR	PS speed	0.620[a]	9.493***	--	Yes
H4	Serendipitous IOR > Active IOR	PS creativity	0.478[a]	5.526***	--	Yes

Notes: Two-tailed test.
[a] Coefficient differences.
** Significant at the 5% level.
*** Significant at the 1% level.

Table 4. Results of the MICOMs procedure and Multi-group analysis based on permutation test

Construct	Step 1	Step 2 Compositional Invariance			Step 3a Equal Variances				Step 3b Equal Means				Full MIE
	Configural Invariance	Original Correlation	5%	Partial MIE	Variance-Original Difference (PNEW-PNEN)	2.5%	97.5%	Equal	Mean-Original Difference (PNEW-PNEN)	2.5%	97.5%	Equal	
SIOR	Yes	0.999	0.997	Yes	-0.108	-0.283	0.269	Yes	-0.084	-0.297	0.300	Yes	Yes
AIOR	Yes	1.000	0.998	Yes	-0.256	-0.306	0.282	Yes	0.176	-0.310	0.292	Yes	Yes
PSS	Yes	0.998	0.998	Yes	-0.321	-0.365	0.350	Yes	0.190	-0.305	0.303	Yes	Yes
PSC	Yes	0.998	0.996	Yes	-0.093	-0.397	0.367	Yes	-0.196	-0.302	0.299	Yes	Yes

Direct effects on Endogenous Variables	PNEW			PNEN			Permutation	Significant
	R^2	Direct Effect	p-value	R^2	Direct Effect	p-value	p-value	
PSS	0.301			0.533				
H5a: AIOR		0.547	0.000		0.777	0.000	0.030	Yes
H6a: SIOR		0.076	0.435		0.094	0.302	0.892	No
PSC	0.478			0.375				
H5b: AIOR		0.363	0.000		0.077	0.442	0.044	Yes
H6b: SIOR		0.603	0.000		0.651	0.000	0.680	No

Notes: SIOR: Serendipitous international opportunity recognition; AIOR: Active international opportunity recognition; PSS: Problem-solving speed; PSC: Problem-solving creativity; PNEW: International entrepreneurs with past negative entrepreneurial experience subsample; PNEN: International entrepreneurs without past negative entrepreneurial experience subsample; Partial MIE: Partial Measurement Invariance Established; Full MIE: Full Measurement Invariance Established.
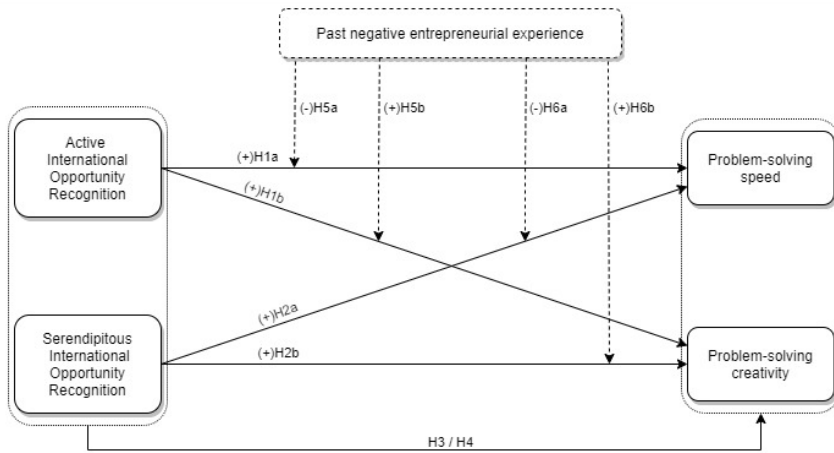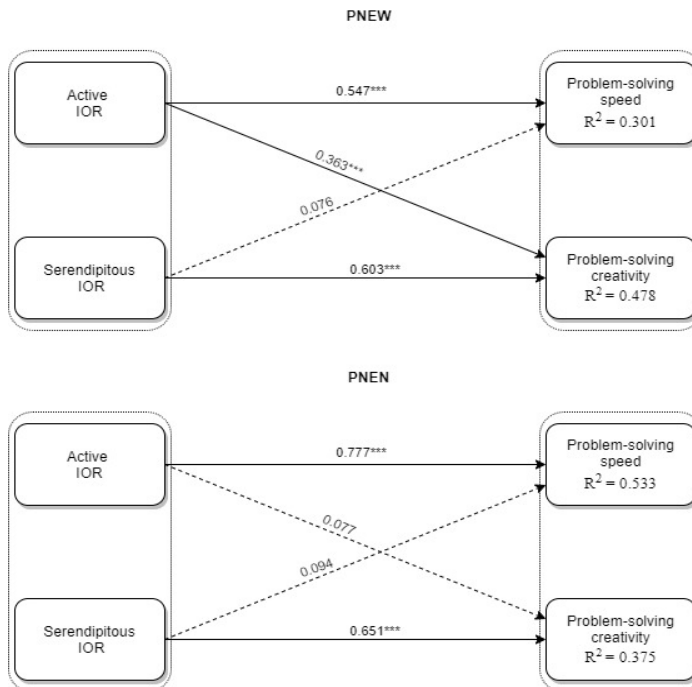
Figure 1. Conceptual model

Figure 2. The model's path coefficients and R^2s (PNEW group and PNEN group)

Notes: PNEW: International entrepreneurs with past negative entrepreneurial experience subsample; PNEN: International entrepreneurs without past negative entrepreneurial experience subsample.
***Significant at the 1% level.