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Current Trends in Entrepreneurship: Entrepreneurial Orientation, Intention, and Alertness

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Business consulting, knowledge absorptive capacity, and innovativeness: A triangular model for micro and small enterprises in Poland

Wojciech Grabowski[1], *Edward Stawasz*[2]

Abstract

PURPOSE: *This paper proposes a triangular relationship between business consulting, knowledge absorptive capacity, and innovativeness. The role of knowledge absorptive capacity in stimulating the impact of business consulting on innovativeness is studied.* ***METHODOLOGY:*** *An empirical study is conducted using the CATI method, and it is based on data concerning 382 Polish micro and small enterprises. Qualitative variables reflecting using business consulting, knowledge absorptive capacity and innovativeness are defined. The multivariate discrete choice model taking into account relationships among these constructs, is proposed and its parameters are estimated.* ***FINDINGS:*** *The results of the empirical research indicate that business consulting in Poland and similar countries may help firms implement innovative solutions. Knowledge absorptive capacity stimulates innovativeness and has a positive impact on the relationship between using business consulting and improvement in innovativeness. Though the frequency of using business consulting is an important factor in improving innovativeness, cooperation between a consultant and a manager matters more.* ***IMPLICATIONS:*** *Results of the empirical research indicate that cooperation between a consultant and a manager may help reduce differences of opinion and internal conflicts. A higher propensity to cooperate may significantly improve the functioning of an enterprise. Business consulting has an indirect and direct effect on innovativeness. It has a positive impact on knowledge absorptive capacity, while better knowledge stimulates innovativeness.* ***ORIGINALITY AND VALUE:*** *An original triangular model of the relationship between business consulting, knowledge absorptive capacity, and innovativeness is proposed.*

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Advanced econometric methods are used in order to find complex relationships between using business consulting, knowledge absorptive capacity, and improvement in innovativeness. Moreover, results of the estimation of the parameters of the econometric model provide interesting recommendations for policies supporting the development of business consulting in the Polish economy.
***Keywords**: business consulting, knowledge absorptive capacity, innovativeness, multivariate discrete choice model, development support policy, econometric model, economy*

INTRODUCTION

Business consulting is often mentioned as the main source of improving the innovativeness of micro and small enterprises (MSEs) in catching-up and post-transition economies.[3] MSEs have limited financial resources regarding managerial knowledge, weak management capabilities, and they spend less money on research and development activities. For MSEs in catching-up and post-transition economies, the role of business consulting is still not well described in the literature (Bojica, Ruiz-Jimenez, Ruiz-Nava, & Fuentes-Fuentes, 2018). The range and frequency of using business consulting vary due to factors associated with the sector, location, enterprise size, its development orientation, as well as support policy (Mole, Baldock, & North, 2013; Blackburn, Hart, & Wainwright, 2013). The results of empirical studies are ambiguous. Some studies found that business consulting positively impacts management quality, enterprise performance, and innovativeness (Delanoe, 2013). On the other hand, some authors indicate that business consulting frequently fails to enhance performance because it is difficult to manage contracts (Love & Roper, 2005; Hoecht & Trott, 2006).

According to the knowledge spillover theory, new knowledge acquired from business advisors is an important source of entrepreneurial opportunities (Qian & Acs, 2013). However, the benefits of using new knowledge depend on the knowledge absorptive capacity of enterprises. Knowledge absorptive capacity is defined by Cohen and Levinthal (1990) as "an ability to recognize the value of new information, assimilate it and apply to commercial ends." Zahra and George (2002) identify four dimensions of absorptive capacity: acquisition, assimilation, transformation, and exploitation of external knowledge. Absorptive capacity allows entrepreneurs to understand and recognize the value of new knowledge and commercialize it.

3 Empirical research is conducted on the basis of data for Polish micro and small enterprises. However, an analysis of the relationships between the use of business consulting, knowledge absorptive capacity, and innovativeness in Poland requires an understanding of the functioning of these aspects in similar countries. Poland may be treated as a catching-up and post-transition economy. Hence, studies focused on these aspects in such economies are mentioned in order to introduce the problem.

Business consulting may play an important role in developing the absorptive capacity of MSEs. At the same time, however, consulting alone cannot replace the decisive role of the absorptive capacity of an organization. The intellectual capital and its components, such as human capital, structural capital and relational capital, are the key sources of absorptive capacity (Kmieciak & Michna, 2018; Stawasz, 2021). Consulting activities may improve the absorptive capacity of MSEs but cannot replace the capitals mentioned above.

Innovativeness may undoubtedly help MSEs survive and achieve market success (Hue, 2019). However, firms in catching-up and post-transition markets are often reluctant to invest in innovation due to institutional voids endemic to such markets (Back, Parbotteeah, & Nam, 2014). Therefore, management consultancy firms in such markets can fill institutional voids and thus help implement innovation initiatives. Moreover, innovations and development of competitive advantage very often require new management and technological knowledge. The absorptive capacity of enterprises is very important to gain knowledge and utilize it efficiently for innovations (Schweisfurth & Raasch, 2018; Henderman & Catner, 2018; Audretsch, Siegel, & Terjesen, 2020). Empirical studies show that firms' investments in knowledge and absorptive capacity significantly improve their innovativeness (Audretsch & Link, 2019).

A low level of innovativeness in catching-up and post-transition countries motivates companies to identify sources of obstacles and think about how to overcome them. Though the role of business consulting and absorptive capacity in improving innovativeness has been broadly studied in the economic literature, studies on this topic are scarce regarding MSEs in Poland and similar countries.[4] To the best of the authors' knowledge, an approach that considers the indirect and moderating impact of absorptive capacity, as well as the impact of using advisory services on innovativeness, has not been studied before. The results of our empirical research may provide recommendations for the policy of supporting consultancy firms and providing grants to business consulting services. The empirical results may also provide recommendations in the area of increasing knowledge absorptive capacity in Poland. The obtained results may also provide recommendations for consultancy agencies in the area of providing support for firms.

This paper explains the impact of using business consulting and absorptive capacity on the innovativeness of MSEs in Poland as a representative post-transition Central and Eastern Europe (CEE) economy. We propose a triangular model that captures the impact of using business consulting

4 Empirical studies devoted to the analysis of determinants of the innovativeness of Polish family firms were conducted by Surdej (2014, 2016).

and absorptive capacity on innovativeness, and estimate parameters of a multivariate ordered choice model. The empirical study was conducted in 2019 using the CATI method, and it was based on data concerning 382 Polish MSEs and covering period 2017-2019. The paper is structured as follows. In the second section, a literature review is provided. In the third section, data are presented, and descriptive statistics are provided. The fourth section presents the results of estimating the parameters of the econometric model and provides a discussion. The fifth section concludes.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Innovation remains the primary source of competitive advantage and business success (Hult, Hurley, & Knight, 2004) and is a cornerstone of sustainable growth (Doz, Santos, & Williamson, 2001). However, innovation is often associated with obstacles, and in such economies as Poland, micro and small enterprises rarely innovate (Arendt & Grabowski, 2019). Innovation usually involves research into unknown areas and requires extensive time and effort, while the outcome is typically uncertain and may take a long time to materialize (Back et al., 2014). As Fu, Pietrobelli, and Soete (2011) argue, innovation is costly, risky, and path-dependent. Therefore, innovation-related activities are highly risky even in the most developed economies of the world (e.g., the USA). According to Atkinson and Lind (2018), large firms are the primary engines of innovation and employment growth, as well as an important source of prosperity. In the USA, MSEs are outperformed by larger firms in all important indicators (i.e., productivity, innovativeness, salaries, corporate social responsibility, environmental protection, tax payment discipline). A similar situation concerns catching-up and post-transition markets, where investment in innovation is highly dangerous. Firms located in those economies inevitably hesitate to invest in innovation because these markets have highly embedded uncertainty (Powell & Grodal, 2005). As a result, innovation investments do not necessarily guarantee better performance, and firms in catching-up and post-transition markets are often reluctant to invest in innovation because of the institutional voids that are endemic to such markets (Bianchi, 2014).

A low level of innovativeness in catching-up and post-transition countries motivates companies to identify sources of obstacles and think about how to overcome them. Back et al. (2014) argue that management consultancy firms can fill institutional voids and help firms implement innovation initiatives. While in most developed markets firms take well-functioning public institutions as a given, these institutions function poorly

in catching-up, post-transition economies (Bianchi & Croce, 2016). Since institutional theory indicates that businesses tend to outperform if they receive institutional support (Xin & Pearce, 1996), it is argued that business consulting firms may assist institutions in catching-up and post-transition countries and help enterprises invest in research and development as well as introduce product and process innovations. However, business consulting cannot fill the institutional void or vacuum, alone. Business consulting cannot replace the multi-actors of the entrepreneurial ecosystem. But, in particular in the case of catching-up and post-transition economies characterized by poor functioning of public institutions, good cooperation between business consulting firms and other actors of the entrepreneurial eco-system may provide significant gains (Hall & Soskice, 2001).

A significant amount of the literature points to the interactive character of the innovation process (see Back et al., 2014). It is suggested that innovativeness is fostered by interactions with external sources of knowledge (Powell & Grodal 2005; Ren, Eisingerich, & Tsai, 2015), and relationships with others can be a valuable innovation tool. Knowledge links provide firms with easier access to new ideas (Lasagni, 2012). Therefore, microenterprises, as well as small- and medium-sized firms, are more likely to depend on external knowledge than larger ones (Zhou & Li, 2010). The literature on inter-firm relationships suggests that enterprises can obtain new knowledge and insights from external sources, significantly improving innovation performance (Johnsen, Phillips, Caldwell, & Lewis, 2006; Ren, Eisingerich, & Tsai, 2015). When enterprises search for information through inter-firm relationships, they are able to gain access to business knowledge and ideas that they are unlikely to find on their own (Coviello, 2006). Therefore, it is argued that management consulting enterprises can help firms in catching-up and post-transition economies by providing the resources they lack (Hitt, Bierman, Shimizu, & Kochhar, 2001; Lin, Yang, & Arya, 2009).

The next argument for the role of business consultants in improving the innovativeness of enterprises from catching-up and post-transition economies is associated with their domestic environment and their ambition to enter foreign markets. Firms that operate in less developed markets may be protected by several barriers, license fees, high tariffs, and even state ownership (Perez-Batres & Eden, 2008). With these barriers gone, they may not have the capability to compete in foreign markets or exploit innovative ideas. Therefore, consultants can act as market and information intermediaries by providing access to expertise and knowledge and legitimizing force. Business consultants can compensate for institutional voids in such economies by offering appropriate sources of innovation and providing firms with access to advantages to ensure value creation (Makadok, 2011; Huang, Gao, Fan, &

Hassan, 2022). Therefore, these enterprises may use external consultants to access critical information, increasing their innovation potential.

The next important role that consultancy agencies play is that of a legitimizer that supports and justifies its customer's decisions. Professional business consultants can make their clients' firms accelerate risky decisions and foster technical change by providing legitimacy for innovation based on high-quality analytical skills and experience (Back et al., 2014). In this context, business consulting providers can be treated as symbols of contemporary social change (Sturdy, 2011). Management consultants may also offer cutting-edge knowledge, as well as advice on innovation, and lend legitimacy to innovation decisions. Since access to knowledge networks is considered one of the key antecedents of firm innovation (Hoegl, Parboteeah, & Munson, 2003), management consultancy provides enterprises in catching-up and post-transition markets with guidance in facilitation innovation.

In addition, management consultancy offers several mechanisms to enhance innovation. For example, Sandberg and Werr (2003) indicate that customer-oriented consulting services often provide a firm with strong customer intelligence that may be combined with technological expertise to foster the development of new products and increase innovativeness. Consulting services can also reveal the gaps between customer expectations and supply. When this gap is addressed, innovation may be created. The next impact of consultancy services on innovativeness is based on generating in-depth knowledge of a firm's industry. As Czerniawska (2004) argues, specialist sectoral know-how belongs to the most sought-after qualities. It is undeniable that the in-depth expertise provided by business consultants can allow enterprises to encounter insights and connections helping innovation.

Though, in general, the effects of business consulting are positive, some scholars argue that management outsourcing that is present in consultancy may also have negative effects (Walker & Webb, 1984; Love & Roper, 2005; Hoecht & Trott, 2006). Business consulting frequently fails to enhance performance because it is difficult to manage contracts. When using business consulting, decision-making speed may be slow, and quality control may be more difficult than when there is no consulting (Stanko & Calantone, 2011). As Hoecht and Trott (2006) argue, innovation outsourcing has the problem of information leakage. Too much dependence on outsourcing may erode the internal capabilities firms need to recognize and exploit new opportunities on their own.

Disadvantages of consulting also occur because of its outsourced nature. Consulting firms are accused of telling companies what they want to hear, and criticism of business consultants often concerns providing "predefined solutions to unique problems, as well as being rigid in a rapidly moving

environment" (Czerniawska, 2004). Wright and Kitay (2002) argue that companies can sometimes use consulting to justify made decisions. According to Gibson (1998), consulting applied to an international environment is fraught with difficulties. The consultants may not know the cultures in which they are operating, and they may proceed according to the inherently ethnocentric assumption that the techniques or interventions that work in their home country shall work in other cultures.

The absorptive capacity theory of knowledge spillover entrepreneurship suggests that new knowledge does not necessarily lead to improved entrepreneurship (Michelacci, 2002), as absorptive capacity varies among entrepreneurs. On the one hand, it involves the scientific knowledge that the individual should have to understand what a new invention is and to recognize its market value. On the other hand, absorptive capacity relies on the market or business knowledge with which the individual can successfully operate a firm. According to the knowledge spillover theory, the inventor who develops a new technology has scientific knowledge, so his/her success in commercializing the new technology depends on the market knowledge he/she has to start up and operate a business. With strong absorptive capacity, an entrepreneur should have sufficient market and scientific knowledge to understand a new invention developed by others, recognize its market value, and commercialize it (Qian & Acs, 2013). It means that absorptive capacity helps understand knowledge provided by business consultants and utilize this knowledge in introducing innovations.

Based on the previous discussion, we propose a triangular model that takes into account the relationships between the use of business consulting, absorptive capacity, and innovativeness. Figure 1 presents the conceptual model that assumes that business consulting has a positive impact on absorptive capacity and increases innovativeness. Absorptive capacity has both direct and indirect positive impacts on innovativeness: in particular, it has a positive impact on the relationship between using business consulting and innovativeness.

Based on the triangular model presented in Figure 1, we formulate the following hypotheses:

H1: The use of business consulting increases an enterprise's knowledge absorptive capacity.
H2: The more business consulting is used, the greater the improvement in innovativeness.
H3: The improvement in innovativeness grows with better knowledge absorptive capacity.
H4: Knowledge absorptive capacity positively affects the relationship between the use of business consulting and innovativeness.

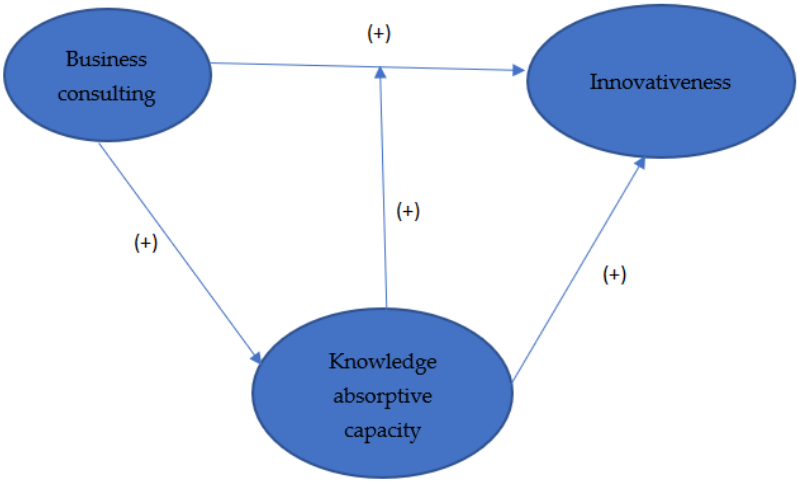

Figure 1. The triangular model of the relationship between the use of business consulting, knowledge absorptive capacity, and innovativeness

METHODOLOGICAL APPROACH

Data

An empirical study was conducted in 2019 using the CATI method[5], based on data concerning 382 Polish MSEs, and covers the period 2017-2019. Survey respondents are owners, co-owners or managers of enterprises. The stratified random sampling is used in order to select the representative sample of MSEs that used business consulting at least once[6], with regard to the following characteristics: size, age, and branch. Distribution of variables reflecting features of enterprises is provided in the Appendix.

Questions reflecting the use of business consulting and knowledge absorptive capacity concern the period 2017-2019. In the case of the question reflecting the improvement of innovativeness, answers concern change between 2017 and 2019. Questions reflecting the use of business

5 This integrated data collection process, which neutralizes the need to distribute paper questionnaires, is characterized by a relatively short time of gathering large samples. This method enables asking multilevel questions, controlling the answers given, and the course of interviews. The problems of using the CATI method are associated with treating research as telemarketing by potential respondents.

6 There are micro and small enterprises that never use business consulting. In the empirical research, we are not interested in such enterprises. The sample is intentionally truncated, and the use of the Heckman correction (Heckman, 1979) is necessary. Therefore, at the beginning, parameters of the binary choice model are estimated and Inverse Mills Ratio is calculated. This ratio is used in the estimation process in order to identify relations between using business consulting, knowledge absorptive capacity, and improvement of innovativeness.

consulting concern compliance with benefits of using business consulting with the expectations, cooperation between a manager and consulting agency, and frequency of using business consulting. In the case of the first question, a three-point Likert scale of answers is provided (low compliance, medium compliance, high compliance). In the case of the second question, a three-point Likert scale of answers is provided too: full cooperation, partial cooperation, lack of cooperation. In the case of the question informing about the frequency of using business consulting, a four-point Likert scale of answers is provided to respondents: very often, often, a few times, once. In the case of the question reflecting absorptive capacity within enterprises, a five-point Likert scale of answers is provided to respondents. Respondents answer whether the level of knowledge absorptive capacity within the enterprise is very low, low, medium, high, or very high. In the case of the improvement in innovativeness, a five-point Likert scale of answers is provided to respondents. Respondents answer whether the improvement in innovativeness resulting from business consulting is very weak, weak, medium, strong, or very strong.

However, we join answers to the questions and create binary variables reflecting using business consulting, as well as three-level ordered variables reflecting absorptive capacity and increase of innovativeness. This is due to the distribution of answers and significantly larger efficiency of the maximum likelihood estimator for the multivariate ordered choice model (Cameron & Tivedi, 2005) in the case of a lower number of variants.

Table 1 provides the definitions of the main categories describing the use of business consulting. The definitions and values of variables describing knowledge absorptive capacity and improvement in innovativeness are provided in Table 2.

Table 1. Definitions of variables describing the use of business consulting considered in the empirical research

Variable	Question in questionnaire	Values of variable
Consulting_ compliance	Do the benefits of using business consulting comply with the expectations?	1 – high compliance, 0 – low or medium compliance
Consulting_ cooperation	Do the manager and consulting agency cooperate[7] when business consulting is provided?	1 – full cooperation, 0 – partial cooperation or lack of cooperation
Consulting_frequency	How frequently is business consulting used?	1 – often or very often, 0 – once or a few times

7 Cooperation means that decisions and recommendations are being made, while the manager and a consultant are discussing problems of functioning of an enterprise. It means that the manager actively participates in the process of providing recommendations by a consulting agency.

Table 2. Definitions of variables describing absorptive capacity and informing about an increase in innovativeness

Variable	Description	Values of variable
Absorptive_ capacity	The level of knowledge absorptive capacity within the enterprise	-1 – a low level 0 – a medium level 1 – a high level
ΔInnovativeness	Improvement in innovativeness resulting from business consulting	-1 – weak improvement, 0 – medium improvement 1 – strong improvement

Features of the managers and the enterprises affect the use of business consulting, knowledge absorptive capacity, and innovativeness. Table 3 presents the descriptions of the explanatory variables in the empirical research.

Table 3. Descriptions of explanatory variables in the empirical research

Variable	Description	Values of variable
Size	Enterprise size	Number of workers within an enterprise
Experience_ manager	Manager's experience	Number of years of experience
Age_enterprise	Enterprise age	1 for enterprises older than 3 years, and 0 otherwise
Regional_ dominating	Information, whether the regional market is dominant	1 for enterprises where the regional market is dominant, and 0 otherwise
National_ dominating	Information, whether the national market is dominant	1 for enterprises where the national market is dominant, and 0 otherwise
International_ dominating	Information, whether the international market is dominant	1 for enterprises where the international market is dominant, and 0 otherwise
More_managing	Information, whether the number of managers is greater than 1	1 for enterprises with at least two managers, and 0 otherwise

Variable	Description	Values of variable
Family_owner_manager	Information, whether the owner and the manager of an enterprise are family-related	1 for the owner and manager being related, and 0 otherwise
Education_economic	The type of education of the manager	1 for managers with an economic education
Education_technical		1 for managers with a technical education
Education_humanities		1 for managers with an education in humanities
Education_law		1 for managers with a legal education

We also include industry sector dummies. The sectors and the appropriate variables are listed in Table 4.

Table 4. Industry sector dummies

Sector	Variable
Production (mainly production of films, food, clothes)	*Branch_Production*
Retail	*Branch_Retail*
Basic services	*Branch_Services*
Knowledge Intensive Business Services	*Branch_KIBS*

Table 5 presents information concerning the distribution of variables describing the use of business consulting.

Table 5. Distribution of business consulting variables

Consulting_compliance	
Value	**Percentage**
0	0.41
1	0.59
Consulting_cooperation	
Value	**Percentage**
0	0.41
1	0.59
Consulting_frequency	
Value	**Percentage**
0	0.76
1	0.24

The results from Table 5 indicate that only about 1/4 of enterprises use business consulting often or very often. More than 3/4 of enterprises use the services of a consulting agency infrequently. For 59% of enterprises, cooperation between a consultant and the manager is identified, and the level of compliance between expectations and the results of consulting is also high.

Table 6 presents the distribution of the dependent variables describing knowledge absorptive capacity and improvement in innovativeness.

Table 6. Distribution of variables reflecting knowledge absorptive capacity and improvement in innovativeness

Absorptive_capacity	
Value	**Percentage**
-1	0.35
0	0.46
1	0.19
ΔInnovativeness	
Value	**Percentage**
-1	0.45
0	0.29
1	0.26

The results from Table 6 indicate that the impact of business consulting on innovativeness is not strong. Almost half of the entrepreneurs do not observe any significant effects of business consulting on innovativeness. This could be explained by the relatively low level of knowledge absorptive capacity. In more than 1/3 of enterprises, knowledge absorptive capacity is low.

Table 7 presents the descriptive statistics for the continuous explanatory variables, while Table 8 gives the percentages of "ones" for the binary variables.

Table 7. Descriptive statistics for continuous explanatory variables

Size	
Mean	7.69
Standard deviation	11.03
Minimum	1
Maximum	49
Experience_manager	
Mean	12.64
Standard deviation	7.21
Minimum	1
Maximum	50

Table 8. Percentages of "ones" for the binary explanatory variables

Variable	Percentage of "ones"	Variable	Percentage of "ones"
Age_enterprise	0.84	*Branch_Retail*	0.16
Regional_ dominating	0.45	*Branch_ Services*	0.52
National_ dominating	0.45	*Branch_KIBS*	0.22
International_ dominating	0.17	*Education_ economic*	0.31
More_managing	0.40	*Education_ technical*	0.50
Family_owner_ manager	0.20	*Education_ humanities*	0.10
Branch_Production	0.10	*Education_law*	0.09

The results from Table 7 and Table 8 indicate that:

- the average size of an enterprise is very small (about eight workers);
- about 84% of enterprises in the sample are at least four years old;
- internationally active enterprises constitute 17% of the sample;
- the domestic market is dominant for 45% of enterprises;
- about 40% of enterprises have at least two managers;
- in about 1/5 of companies, family relationships between manager and owner are identified;
- 10% of enterprises are active in production, 16% are in retail, more than 50% offer basic services, and 22% provide knowledge intensive business services.

Methodology

As already indicated in the previous sections, we consider the relationships between the use of business consulting, knowledge absorptive capacity, and improvement of innovativeness. Moreover, binary variables describe compliance with effects of consulting with expectations, propensity to cooperate between manager and consultant, as well as the frequency of using business consulting. Ordered discrete variables describe knowledge absorptive capacity, as well as improvement of innovativeness. In order to analyze the relationships between using business consulting, knowledge absorptive capacity and improvement of innovativeness presented in Figure 1, parameters of a multivariate ordered choice model are estimated. The choice of the method is due to the character of variables, as well as more

than one linkage among analyzed constructs (the use of business consulting, knowledge absorptive capacity, improvement of innovativeness).

The multivariate ordered choice model consists of a few models explaining the use of business consulting, knowledge absorptive capacity, and improvement of innovativeness. At the beginning of the estimation process, the parameters of the econometric models that explain the use of business consulting are estimated. Quality of using business consulting is described by three main elements:

- compliance of the benefits of business consulting with expectations;
- cooperation between the manager and the consulting agency;
- frequency of using business consulting.

Three binary choice variables are defined. Their definitions are presented in Table 1. Type of variables (binary variables) indicates that a binary choice model is estimated three times. The choice of an appropriate binary choice model depends on the distribution of the error term. We start with the assumption that the error term follows normal distribution and later verify the validity of this assumption. Therefore, in order to identify the determinants of how much the benefits of business consulting are as expected, the following probit model is considered:

$$Consulting\_compliance_i^* = \boldsymbol{x}_i\boldsymbol{\beta}^{Consulting\_compliance} + \varepsilon_i^{Consulting\_compliance} \quad (1.a)$$

$$Consulting\_compliance_i = I\{Consulting\_compliance_i^* > 0\}, \quad (1.b)$$

$$\varepsilon_i^{Consulting\_compliance} \sim N(0,1). \quad (1.c)$$

Cooperation between the manager and the consulting agency is defined by binary variable too. To check which features of the enterprises and managers affect cooperation between the manager and the consulting agency, the following probit model is considered:

$$Consulting\_cooperation_i^* = \boldsymbol{x}_i\boldsymbol{\beta}^{Consulting\_cooperation} + \varepsilon_i^{Consulting\_cooperation} \quad (2.a)$$

$$Consulting\_cooperation_i = I\{Consulting\_cooperation_i^* > 0\}, \quad (2.b)$$

$$\varepsilon_i^{Consulting\_cooperation} \sim N(0,1). \quad (2.c)$$

To explain the frequency of using business consulting, the following probit model is proposed:

$$Consulting\_frequency_i^* = \boldsymbol{x}_i\boldsymbol{\beta}^{Consulting\_frequency} + \varepsilon_i^{Consulting\_frequency} \quad (3.a)$$

$$Consulting\_frequency_i = I\{Consulting\_frequency_i^* > 0\}, \quad (3.b)$$

$$\varepsilon_i^{Consulting\_frequency} \sim N(0,1). \quad (3.c)$$

In models (1.a)-(1.c), (2.a)-(2.c), and (3.a)-(3.c), $\boldsymbol{x}_i$ consists of variables describing features of managers and enterprises. $\boldsymbol{\beta}^{Consulting\_compliance}$, $\boldsymbol{\beta}^{Consulting\_cooperation}$, $\boldsymbol{\beta}^{Consulting\_frequency}$ denote the vectors of parameters for the variables that affect the impact of features of managers and enterprises on how much benefits from business consulting comply with expectations, the propensity for managers to cooperate with consultants, and the frequency of using business consulting. To check the assumptions concerning the distribution of the error term (assumptions (1.c), (2.c), and (3.c)), the normality and symmetric distribution of the error term are verified based on the Stukel (1988) test, while homoscedasticity is verified based on the Holden (2011) test. If the distribution of the error term is symmetric but not normal, the parameters of the logit model are estimated. For invalid assumptions concerning symmetrical distribution, the parameters of the complementary log-log model are estimated; in the case of heteroscedasticity, the parameters of the heteroscedastic probit/logit model are estimated (see Cameron & Trivedi, 2005).

After estimating the models (1.a)-(1.c), (2.a)-(2.c), and (3.a)-(3.c), the theoretical values of variables reflecting the use of business consulting are calculated. These theoretical variables[8] are denoted:

$$\widehat{Consulting\_Compliance_i^*},$$
$$\widehat{Consulting\_Cooperation_i^*},$$
$$\widehat{Consulting\_Frequency_i^*}.$$

In the next step, the parameters of the model that explain the impact of using business consulting on absorptive capacity are estimated:

8 We calculate theoretical values of variables, since the consulting compliance, the consulting cooperation and the consulting frequency are dependent variables in models (1.a)-(1.c), (2.a)-(2.c) and (3.a)-(3.c) and later are treated as explanatory in models (4.a)-(4.c).

$$Absorptive\_capacity_i^* = \boldsymbol{x}_i\ \boldsymbol{\beta}^{Absorptive\_capacity} + \lambda_1 \widehat{Consulting\_Compliance}_i^* + +\lambda_2 \widehat{Consulting\_Cooperation}_i^* + \lambda_3 \widehat{Consulting\_Frequency}_i^* + \varepsilon_i^{Absorptive\_capacity}, \quad (4.a)$$

$$Absorptive\_capacity_i = \begin{cases} -1 & if \quad Absorptive\_capacity_i^* < \mu_1, \\ 0 & if \quad Absorptive\_capacity_i^* \in \langle \mu_1, \mu_2 \rangle, \\ 1 & if \quad Absorptive\_capacity_i^* > \mu_2, \end{cases} \quad (4.b)$$

$$\varepsilon_i^{Absorptive\_capacity} \sim N(0,1). \quad (4.c)$$

The model (4.a)-(4.c) $\boldsymbol{\beta}^{Absorptive\_capacity}$ consists of the parameters reflecting the impact of features of enterprises and managers on knowledge absorptive capacity. In turn, parameters λ_1, λ_2 and λ_3 reflect the impact of using business consulting on enterprises' knowledge absorptive capacity.

The theoretical values of the variable $Absorptive\_capacity_i^*$ are calculated, and this variable is used as explanatory in the equation that explains the improvement in innovativeness:

$$\Delta Innovativeness_i^* = \boldsymbol{x}_i\ \boldsymbol{\beta}^{\Delta Innovativeness} + \widehat{Absorptive\_capacity}_i^* \theta_1 + \boldsymbol{KAC\_BC}_i \boldsymbol{\theta}_2 + \boldsymbol{BCI}_i \boldsymbol{\theta}_3 + \varepsilon_i^{\Delta Innovativeness}, \quad (5.a)$$

$$\Delta Innovativeness_i = I\{\Delta Innovativeness_i^* > \tilde{\mu}_2\} - I\{\Delta Innovativeness_i^* < \tilde{\mu}_1\}, \quad (5.b)$$

$$\varepsilon_i^{\Delta Innovativeness} \sim N(0,1). \quad (5.c)$$

In equation (5.a), elements of the vector $\boldsymbol{BCI}_i$ are defined as follows:

$$\boldsymbol{BCI}_i = \left[\widehat{Consulting\_Compliance}_i^* \quad \widehat{Consulting\_Cooperation}_i^* \quad \widehat{Consulting\_Frequency}_i^*\right]. \quad (6)$$

Elements of the $\boldsymbol{KAC\_BC}_i$ consist of products of elements of the vector (6) and elements of the vector:

$$\boldsymbol{KAC}_i = [I\{Absorptive\_capacity_i = 0\} \quad I\{Absorptive\_capacity_i = 1\}]. \quad (7)$$

The model (5.a)-(5.c) $\boldsymbol{\beta}^{\Delta Innovativeness}$ consists of parameters reflecting the impact of features of enterprises and managers on improvement in innovativeness. θ_1 measures the relationship between knowledge absorptive capacity and improvement in innovativeness. In turn, $\boldsymbol{\theta}_3$ consists of the parameters measuring the impact of using business consulting on improvement in innovativeness. The moderating impact of knowledge

absorptive capacity on the relationship between the use of business consulting and innovativeness is measured with the vector $\boldsymbol{\theta}_2$.

In each case, the strategy "from general to specific" (see Charemza & Deadman, 2003) is applied. We start with the unrestricted model that includes all explanatory variables (the base categories are excluded to avoid perfect multicollinearity). Next, we eliminate variables insignificant at the 0.1 level of significance. In the case of all models, we use the Stata15 software in order to estimate parameters.

RESULTS AND DISCUSSION

Table 9 presents the parameter estimation results of the binary choice models that explain the compliance of business consulting effects with expectations, the cooperation between consultants and managers, and the frequency of using business consulting. Variables not included in the final specifications are statistically insignificant. Apart from the results of the estimation of the parameters, goodness-of-fit of the model is presented using different measures (Mc Fadden R-squared, Percentage of correct predictions, Sensitivity, Specificity, Area under the ROC curve). Moreover, information about the selection of distribution of the error term, as well as results of the testing validity of this selection are presented.

Table 9. Parameter estimation results of the binary choice models that explain the use of business consulting

Explanatory variable	**Equation explaining Consulting_ compliance**		**Equation explaining Consulting_ cooperation**		**Equation explaining Consulting_ frequency**	
	Estimate	Marginal effect	Estimate	Marginal effect	Estimate	Marginal effect
Size	-0.013*	-0.003	-	-	0.019***	0.005
Experience_ manager	-	-	0.034*	0.012	-0.065**	-0.018
Age_enterprise	-0.517**	-0.121	0.383**	0.135	0.343*	0.097
Regional_ dominating	-0.324*	-0.072	0.280*	0.103	-0.251*	-0.071
National_ dominating	-	-	0.282*	0.097	-	-
Education_law	1.014*	0.239	-	-	-	-

Explanatory variable	Equation explaining Consulting_ compliance		Equation explaining Consulting_ cooperation		Equation explaining Consulting_ frequency	
	Estimate	Marginal effect	Estimate	Marginal effect	Estimate	Marginal effect
Education_ technical	-	-	-0.246**	-0.088	-	-
Family_owner_ manager	-	-	-	--	0.730***	0.207
Branch_retail	0.509**	0.120	-	-	-	-
Branch_KIBS	-	-	0.327***	0.117	-	-
Mc Fadden R-squared	0.023		0.029		0.082	
Percentage of correct predictions	63%		67%		75%	
Sensitivity	0.66		0.72		0.58	
Specificity	0.61		0.64		0.78	
Area under the ROC curve	0.66		0.67		0.72	
Model	Logit		Complementary log-log		Probit	
P-value for testing validity of assumption concerning distribution of error term	0.45		0.31		0.72	

Note; *,**,*** denote significance at the 0.1, 0.05, and 0.01 level of significance, respectively.

The estimation results indicate that enterprise size and age have a statistically significant impact on the probability that benefits of business consulting meet expectations. As the number of workers within the enterprise increases by 1, the probability of high compliance of benefits with expectations increases by 0.003, *ceteris paribus*. For firms older than three years, the probability of a high level of compliance is greater by 0.121, *ceteris paribus*. This may be explained by the fact that larger and older firms use business consulting more often and have greater experience with the services offered by consultancy agencies. Therefore, they can compare the benefits of business consulting with historical experience. It means that barriers to using business consulting have greater importance in microenterprises

than in larger ones (Grabowski & Stawasz, 2017). The low awareness of the advantages of using business consulting, problems with evaluating the quality of external consulting, problems with formulating demand for business consulting, problems with choosing a good consultant, problems with absorbing knowledge, fear of losing control of the company, and disclosing limited powers in the management are treated as obstacles to using business consulting (Kailer and Scheff, 1999). Firms employing at least ten employees are more complex and have greater expectations than microenterprises. Therefore, the maladjustment of solutions used by business consultants to the specifics of the enterprise may be more visible in small firms than in microenterprises (Yusoff, Yaacob, & Ibrahim, 2010).

Enterprises whose regional market is dominant are less satisfied with business consulting than firms whose national or international market is dominant. This may be because business consultants help enterprises in internationalization (Vuorio, Torkkeli, & Sainio, 2020). Therefore, enterprises that use business consulting and still provide products mainly on the regional market may not derive the benefits of business consulting. It turns out that the type of education of a managing person has a statistically significant impact on the level of satisfaction with advisory services. Managers with a legal education are more satisfied with business consulting than managers with a technical education, economic education, or an education in humanities. Managers who are lawyers probably do not use business consulting in the area of law; rather, they use it for accounting, statistical methods, optimization, and technical issues. Since their capabilities in these areas are very often insufficient, business consulting helps them to lead a business.

Enterprises that are active in sales are more often satisfied with business consulting. They very often utilize business consulting agencies that provide market forecasts or that apply optimization methods, among others (Lee & Seo, 2018). Using these methods may help change the production profile and make resource management policy more efficient. Therefore, it is not surprising that business consulting services for retail sales companies are very useful, and the recipients of these services are satisfied.

Various factors determine a consultant and an advisor's propensity to cooperate. More experienced managers may better recognize the advantages and disadvantages of non-cooperative and cooperative business consulting, and they may be more aware of the greater benefits of cooperation (McGivern, 1983).

An enterprise's operating range also has a significant impact on the propensity to cooperate. The result is somewhat unusual since enterprises for which the regional or national market is dominant prefer cooperation between managers and consultants. Internationally active enterprises may

search for specific and advanced advisory services provided by consulting agencies located in other regions. Additionally, advisory services for internationally active enterprises may be specialized, and for these services, cooperation between managers and consultants might not be expected.

The propensity to cooperate turns out to be lower in enterprises whose managers have a technical education. When an enterprise is active in a branch of Knowledge Intensive Business Services (KIBS), the propensity to cooperate is higher by 0.117, *ceteris paribus*. E-commerce is among the most important activities of KIBS, and these firms cooperate with other companies of the KIBS branch who provide appropriate software. Due to the increasing role of information and communication technologies within enterprises (Arendt & Grabowski, 2017) and the increasing role of e-commerce, cooperation among KIBS seems to be crucial (Han & Kim, 2019).

The frequency of using business consulting depends on the size and age of an enterprise, as well as the experience of the manager. Larger and older enterprises more often use business consulting than smaller and newer ones. This is in line with expectations, since older firms and smaller firms have greater financial capabilities and can buy consultancy services more often than young microenterprises (Grabowski & Stawasz, 2017). However, managerial experience is negatively correlated with the frequency of using business consulting. More experienced managers have a better opinion about their own management capabilities (Man, 2012) and have a lower propensity to use business consulting often or very often.

A lower frequency of using business consulting is also observed in firms that mainly operate in a regional market. There are at least two explanations for this result. Firstly, such enterprises do not have the appropriate financial resources to use business consulting more often. Moreover, these firms very rarely provide sophisticated solutions, so they require consultancy services less often. When there are family relations between the owner and the manager, the frequency of using advisory services is higher by 0.207, *ceteris paribus*. It is argued that family managers may act as stewards by considering the company's success as their own, more intensively than agents who seek to achieve personal benefits at the expense of the firm (Charbel, Elie, & Georges, 2013). Therefore, family managers' propensity to use business consulting more often is not surprising.

Results of measuring goodness of fit inform that models fit well with the data. In the case of the equation explaining consulting compliance, the error term follows logistic distribution. The error term follows normal distribution in the case of the model explaining consulting frequency. In the case of the model explaining cooperation between manager and consultant, complementary log-log distribution of the error term turns out to be optimal.

In the next step, the parameters of the ordered choice model that explains knowledge absorptive capacity are estimated. Table 10 presents the results of the estimation of models (4.a)-(4.c) with measuring goodness-of-fit and validity of assumptions concerning homoscedasticity and normality of distribution of error term.

Table 10. Results of the estimation of the parameters of the ordered choice model that explains knowledge absorptive capacity

Variable	Estimate	Variable	Estimate
$\widehat{Consulting\_Cooperation}_i^*$	0.126**	*Experience_manager*	0.022***
$\widehat{Consulting\_Frequency}_i^*$	0.142**	*International_dominating*	0.625***
Size	-0.017***	μ_2	1.081
μ_1	-0.226		
McFadden R-squared	0.036		
P-value for testing normality of error term	0.46		
P-value for testing homoscedasticity of error term	0.51		

Note: *,**,*** denote significance at the 0.1, 0.05, and 0.01 level of significance, respectively.

The positive impact of cooperation on knowledge absorptive capacity is in line with the expectations and results of various empirical studies. For example, the findings obtained by Lu and Huang (2010) indicate that internal advisors exhibit significantly weaker capabilities than consultants, especially in knowledge structure, knowledge transformation, trainee orientation, and training ethics. The capability gap is disadvantageous for firms wanting to absorb consulting knowledge. It means that the work of internal advisors is not sufficient, and cooperation between internal and external advisors helps reduce the knowledge gap.

Differences of opinion and internal conflicts on whether the knowledge assimilated should be used or not are mentioned as the most important reasons why externally sourced knowledge remains unused (Davenport & Prusak, 1998). Cooperation between a consultant and a manager may help reduce these differences of opinion and internal conflicts. Therefore, a greater propensity to cooperate may significantly improve the functioning of an enterprise.

There are also arguments to link the frequency of using business consulting with knowledge absorptive capacity. As Cohen and Levinthal (1990) argue, absorptive capacity largely depends on the level of prior

related knowledge. The first use of business consulting increases the level of prior knowledge, while additional knowledge is absorbed in subsequent uses. Zahra and George (2002) argue that the absorptive capacity is formed by acquisition and assimilation, as well as transformation and exploitation. When an enterprise uses business consulting more often, chances for acquisition, assimilation, transformation, and exploitation are greater. The results confirm the validity of hypothesis H1.

It turns out that managerial experience and an enterprise's international activity have a positive impact on knowledge absorptive capacity. This result is in line with expectations since a more experienced manager can more critically evaluate external knowledge and choose the knowledge that helps an enterprise function. Moreover, experience positively affects self-efficacy and self-evaluation of management knowledge and knowledge absorptive capacity (Khedhaouria, Gurau, & Torre's, 2015). International activity requires a higher level of management knowledge. The positive linkage between internationalization and knowledge absorptive capacity confirms the findings of numerous studies devoted to this topic (Tsai, 2001; Agramunt, Berbel-Pineda, Capobianco-Urarte, & Casado-Belmonte, 2020). In Poland the level of knowledge absorptive capacity in the group of microenterprises proved to be larger than in the case of small firms. The obtained results indicate that there is neither a problem of heteroscedasticity nor non-normality of the error term. The imposed assumptions are valid and goodness-of-fit of the model is satisfactory.

In the next step, the parameters of the ordered choice model that explains the improvement in innovativeness are estimated. The results of the estimation are presented in Table 11. Table 11 presents the results of measuring goodness of fit and testing validity of imposed assumptions too.

Table 11. Results of the estimation of the parameters of the ordered choice model explaining the improvement in innovativeness

Variable	Estimate
$\widehat{Absorptive\_capacity_i^*}$	0.557***
$\widehat{Consulting\_Cooperation_i^*}$	0.189**
$\widehat{Consulting\_Cooperation_i^*} * I\{Absorptive\_capacity_i = 1\}$	0.516***
$\widehat{Consulting\_Compliance_i^*}$	0.197**
Experience_manager	0.020**
Age_enterprise	-0.454***
Education_law	0.581*
Education_technical	0.312**

Variable	Estimate
$\tilde{\mu}_1$	-0.198
$\tilde{\mu}_2$	0.683
McFadden R-squared	0.065
P-value for testing normality of error term	0.26
P-value for testing homoscedasticity of error term	0.59

Note: *,**,*** denote significance at the 0.1, 0.05, and 0.01 level of significance, respectively.

The estimation results indicate that knowledge absorptive capacity has a positive impact on the improvement in innovativeness. The results confirm the validity of hypothesis H3. Absorptive capacity proves to be vital to gain knowledge and utilize it efficiently for innovations (Henderman & Catner, 2018; Audretsch et al., 2020; Nie, Gong, Lai, Jiang, & Dong, 2021). It means that it is strongly recommended for firms from Poland to invest in knowledge and absorptive capacity. Similarly, as in developed countries, investments in knowledge and absorptive capacity significantly improve innovativeness in MSEs in Poland (Audretsch & Link, 2019; Audretsch, Belitski, & Caiazza, 2021; Secundo, Mele, Del Vecchio, & Degennaro, 2021).

The estimation results also indicate that management consultancy firms in Poland and similar economies can fill institutional voids and help implement innovation initiatives (Back et al., 2014). Since institutional theory posits that businesses that receive institutional support tend to outperform non-receivers (Xin & Pearce, 1996), business consulting may help enterprises invest in research and development and introduce product and process innovations. It turns out that in the case of MSEs in a post-transition economy, innovativeness is fostered by interactions with external advisors (Ren et al., 2015). The relationships between managers and business consultants can be a valuable tool of innovation. Greater cooperation increases innovativeness. Moreover, the relationship between cooperation and innovativeness is fostered by absorptive capacity. For enterprises with very high absorptive capacity, the impact of cooperation on the increase in innovativeness is significantly greater.

The results confirm the validity of hypotheses H2 and H4. It means that absorptive capacity not only increases innovativeness but stimulates positive effects of cooperation between a business consultant and a manager. Compliance between expectations and benefits of business consulting positively stimulates the innovativeness of MSEs in Poland. If an enterprise is more satisfied with advisory services, it has a higher propensity to introduce changes, which may lead to innovation (Tokar-Szadai, 2017). Strange findings concern the relationship between frequency of using business consulting and

innovativeness. The results indicate that a higher frequency of using business consulting does not necessarily lead to greater innovativeness. However, the frequency of using business consulting positively affects knowledge absorptive capacity, which stimulates innovativeness. Therefore, it may be argued that the frequency of using business consulting has a direct impact on the improvement in innovativeness.

Four control variables turn out to be significant in the equation that explains the improvement in innovativeness. When managerial experience is greater, innovativeness improves, *ceteris paribus*. Managerial experience is an important external factor in a triangular consulting—absorptive capacity—innovativeness system. More experienced managers have a greater propensity to cooperate with business consultants. Experience increases knowledge absorptive capacity and positively affects innovativeness. These results indicate that business consultants in post-transition economies should try to better explain the contents of consulting to less experienced managers. Business consulting offers should take into account the capabilities of young managers, too. The probability of a strong improvement in innovativeness is lower in older enterprises, although it is observed in companies whose managers have a legal or technical education. It means that consultancy services providers should reconsider their offer to enterprises managed by managers with economic education or education in humanities.

The obtained results indicate that the error term is homoscedastic and follows normal distribution. The imposed assumptions are valid and goodness-of-fit of the model is satisfactory.

As a robustness check, an estimation is conducted with the assumption that ordered variables describing absorptive capacity and improved innovativeness are treated as binary. Values (-1) are replaced by 0. Table 12 presents information concerning the significance and signs of the estimates in the basic and an additional model (a model with binary variables reflecting absorptive capacity and innovativeness).

When the specification of dependent variables changes, then signs of the estimates do not change, and the significance of the parameters is not worse. It tells us about the robustness of the results.

Table 12. Results of a robustness check – instead of ordered variables reflecting knowledge absorptive capacity and improvement in innovativeness, binary variables are taken into account

Variable in equation	Basic model	Additional model
$\widehat{Consulting\_Cooperation}_i^*$ in the equation explaining Absorptive capacity	**(+)	***(+)
$\widehat{Consulting\_Frequency}_i^*$ in the equation explaining Absorptive capacity	**(+)	**(+)
$Absorptive\_\hat{c}apacity_i^*$ in the equation explaining improvement of innovativeness	***(+)	***(+)
$\widehat{Consulting\_Cooperation}_i^*$ in the equation explaining improvement of innovativeness	**(+)	***(+)
$\widehat{Consulting\_Cooperation}_i^* * I\{Absorptive\_capacity_i = 1\}$ in the equation explaining improvement of innovativeness	***(+)	***(+)
$\widehat{Consulting\_Compliance}_i^*$ in the equation explaining improvement of innovativeness	**(+)	**(+)

Note: *,**,*** denote significance at the 0.1, 0.05, and 0.01 level of significance, respectively.

CONCLUSIONS AND LIMITATIONS

A triangular system of the relationship between using business consulting, knowledge absorptive capacity, and improvement in innovativeness is studied. An empirical analysis is conducted in 2019 for a representative sample of 382 Polish MSEs. The results of the empirical study indicate that the use of business consulting and cooperation between a consultant and a manager improve absorptive capacity and help increase innovativeness in MSEs in Poland. Though frequent use of advisory services turns out to be an appropriate strategy for microenterprises and small firms in Poland, non-cooperation between advisors and managers is less efficient than cooperation. Cooperation may help reduce differences of opinion and internal conflicts within an enterprise, so a higher propensity to cooperate reduces the knowledge gap, increases absorptive capacity, and has a positive impact on the innovativeness of MSEs in Poland.

According to the institutional theory, businesses that receive support tend to outperform non-receivers. Thus, management consultancy firms in the Polish economy fill institutional voids and help implement innovation initiatives. The innovativeness of MSEs in Poland is fostered by external advisors. However, appropriate cooperation between consultants and managers increases the positive effects of business consulting. Cooperation helps consultants understand an enterprise's problems and expectations,

and it helps managers utilize consulting. Knowledge absorptive capacity is a vital factor in the triangular system. Not only does it increase the innovativeness of MSEs, but it also moderates the role of business consulting in stimulating innovativeness.

Results of the empirical research indicate that hypotheses H1-H4, which are stated in the paper, are valid. However, some exceptions can be found and confirmation of the validity of these hypotheses is not unconditional. Differences concern the impact of different aspects of the use of business consulting (consulting frequency, consulting cooperation, consulting compliance) on knowledge absorptive capacity and innovativeness. For example, the frequency of using business consulting has only a direct impact on innovativeness. In the case of consulting compliance and consulting cooperation, their impact on improvement in innovativeness is indirect and direct.

Though the results indicate that the role of business consultants is very important, some problems have been identified as well. The impact of business consulting on reducing the knowledge gap is stronger in older enterprises led by more experienced managers. Moreover, more experienced managers are able to better utilize business consulting and improve innovativeness. It means that consultancy agencies could reconsider how they provide their services to new enterprises that employ young managers. Institutional support should be directed to providers of business consulting for young enterprises and non-experienced managers. Such incentives could improve knowledge absorptive capacity and increase the innovativeness of MSEs in Poland.

The research is not without limitations. The most important shortcoming is associated with the use of data covering a stable period in the Polish and global economy. In 2019, MSEs in Poland performed well, due to stable energy prices, lack of problems associated with supply chains and high rate of growth of real GDP. After the outbreak of the COVID-19 pandemic, as well as during a significant increase of energy and wheat prices associated with the Russian invasion of Ukraine, an important increase of barriers to development of MSEs is observed. Moreover, the use of data for one country makes inference for the region of the Central and Eastern Europe difficult.

Adopting a comparative perspective covering other countries of Central and Eastern Europe would be a significant research challenge and agenda. In future research, the performance of enterprises in other CEE countries will be studied in order to check whether Polish MSEs are similar to their counterparts from other countries of the region. Additionally, empirical research conducted after the COVID-19 pandemic and covering the period of turbulences in the food and energy market, could provide conclusions concerning the role of business consulting services in times of crisis.

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Appendix

The tables below present the distribution of MSEs that used business consulting at least once with regard to size, age and branch of an enterprise Table A1 presents the distribution of enterprises with regard to size. Table A2 presents the distribution of enterprises with regard to age, while Table A3 presents the distribution of enterprises with regard to branch.

Table A1. Distribution of enterprises in the sample with regard to size

Number of employees	Number of enterprises	Ratio of enterprises
1-4	252	0.66
5-9	50	0.13
10-20	42	0.11
21-49	38	0.10

Table A2. Distribution of enterprises in the sample with regard to age

Age	Number of enterprises	Ratio of enterprises
Start-up (Less than 1 year)	8	0.02
1-3 years	53	0.14
4-10 years	199	0.52
More than 10 years	122	0.32

Table A3. Distribution of enterprises in the sample with regard to branch

Age	Number of enterprises	Ratio of enterprises
Production	39	0.10
Retail	61	0.16
Basic service	198	0.52
Knowledge Intensive Business Services	84	0.22

Abstrakt

CEL: *W artykule zaproponowano trójkątny model zależności między doradztwem biznesowym, zdolnością absorpcji wiedzy i innowacyjnością. Badana jest rola zdolności absorpcji wiedzy w stymulowaniu wpływu doradztwa biznesowego na innowacyjność.* ***METODYKA:*** *Badanie empiryczne prowadzone jest metodą CATI na podstawie danych dotyczących 382 polskich mikro i małych przedsiębiorstw. Zdefiniowano zmienne jakościowe odzwierciedlające korzystanie z doradztwa biznesowego, zdolność absorpcji wiedzy oraz innowacyjność. Zaproponowano wielowymiarowy model dyskretnego wyboru uwzględniający relacje między tymi konstruktami i oszacowano jego parametry.* ***WYNIKI:*** *Wyniki badania empirycznego wskazują, że doradztwo biznesowe w Polsce i podobnych krajach może pomóc firmom we wdrażaniu innowacyjnych rozwiązań. Zdolność absorpcji wiedzy stymuluje innowacyjność i wpływa pozytywnie na relacje pomiędzy korzystaniem z doradztwa biznesowego a poprawą innowacyjności. Choć częstotliwość korzystania z doradztwa biznesowego jest ważnym czynnikiem w podnoszeniu innowacyjności, to współpraca konsultanta z menedżerem ma większe znaczenie.* ***IMPLIKACJE:*** *Wyniki badania empirycznego wskazują, że kooperacja między konsultantem a osobami zarządzającymi przedsiębiorstwem może pomóc zredukować różnicę w opiniach i zakończyć konflikty wewnątrz firmy. Doradztwo biznesowe okazuje się mieć bezpośredni i pośredni wpływ na innowacyjność. Pośredni wpływ polega na oddziaływaniu na zdolność absorpcji wiedzy, która jest ważną determinantą innowacyjności.* ***ORYGINALNOŚĆ I WARTOŚĆ:*** *Zaproponowano autorski trójkątny model relacji między doradztwem biznesowym, zdolnością absorpcji wiedzy i innowacyjnością. Zaawansowane metody ekonometryczne są wykorzystywane w celu analizy złożonych zależności między wykorzystaniem doradztwa biznesowego, zdolnością absorpcji wiedzy i poprawą innowacyjności. Ponadto wyniki estymacji parametrów modelu ekonometrycznego dostarczają ciekawych rekomendacji dla polityki wspierania rozwoju doradztwa biznesowego w polskiej gospodarce.*

Słowa kluczowe: *doradztwo biznesowe, zdolność absorpcji wiedzy, innowacyjność, wielorównaniowy model dyskretnego wyboru, polityka wspierania rozwoju, model ekonometryczny, gospodarka*

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Conflicts of interest

The authors declare no conflict of interest.

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Sustainable development and entrepreneurship in emerging countries: Are sustainable development and entrepreneurship reciprocally reinforcing?

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Abstract

PURPOSE: *Entrepreneurship seen as an engine for economic development is especially desirable for emerging countries to support rapid growth. Moreover, entrepreneurs can support social transformation in favor of more sustainable products and services. Sustainable orientation of entrepreneurship contributes to sustainable development goals and prevents environmental deprivation. However, the sustainable development agenda can also influence entrepreneurship.* ***METHODOLOGY:*** *The conducted bibliometric analysis confirmed the growing interest among scholars in the correlation of entrepreneurship to sustainability in the last years. Furthermore, panel regression (static model) was used to explore the variables on entrepreneurship influencing the sustainable development goal (SDG) index in emerging countries, and Levin, Lin and Chu (LLC), W-Stat – IPS, ADF-Fisher Chi-Square, and PP-Fisher Chi-Square tests were applied to analyze the variables stationarity. In order to examine the existence of structural breaks, the robustness was checked on single cross-section units and on the whole panel dataset. In addition, the Hausmann test was used to select between random and fixed effects, and heteroskedasticity of residues, autocorrelation of residues and dependence of residues between the panels were conducted. Data was analyzed through Eviews 13.* ***FINDINGS:*** *This paper investigates the relationship between sustainability and entrepreneurship in emerging countries. It discusses the impact of sustainable development on entrepreneurship and the influence of entrepreneurship on sustainable development.* ***IMPLICATIONS:*** *The study results can be used by governments and policymakers to plan their strategies and policies*

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concerning entrepreneurship and implementation of sustainable development goals. They should promote entrepreneurial activity and control the negative environmental impact of enterprises simultaneously. ***ORIGINALITY AND VALUE:*** *The research addresses the gap in the literature concerning the relationship between sustainable development and sustainable entrepreneurship. The paper examines the reciprocal relationship between sustainable development and entrepreneurship with an emphasis on emerging countries.*
Keywords: *entrepreneurship, sustainability, sustainable development, sustainable entrepreneurship, emerging countries, entrepreneurs*

INTRODUCTION

Entrepreneurship is considered to be an engine for economic development and hence is especially desirable for emerging countries to support rapid growth. Entrepreneurs can facilitate social transformation in favor of products and services produced in a sustainable way. Consequently, the sustainable orientation of entrepreneurship contributes to sustainable development goals (SDGs) and avoids environmental degradation. On the other hand, the sustainable development agenda can also affect entrepreneurship. Sustainability, as the effort to balance economic, social, human, and ecological goals, takes into consideration the fact that organizations operate in a complex, interdependent environment.

The concept of sustainable development engages in improving human wellbeing over a long-term period within the sustaining ecosystems (United Nations [UN], 1972). The concept explains that human wellbeing must not be achieved at the cost of a damaged environment, which poses a question of how sustainable development could be interpreted from the point of view of smaller private enterprises (Parrish, 2010). Sustainability-driven enterprises should endure business activities while contributing to sustainable development (Atkinson, 2000).

In recent years, considerable attention has been devoted to entrepreneurship, including social, environmental, sustainable, green, and women entrepreneurship in the academic literature. Entrepreneurs are focused on solving concerns through innovative entrepreneurial activities and business ventures. Entrepreneurship is seen as a driver for economic growth through innovation, job creation, technologies, positive impact on exports and GDP/capita (Cumming, Johan, & Zhang, 2014). Especially, social entrepreneurship has attracted the attention of scholars and practitioners for its capability to contribute to solving urgent social problems and responding to grand challenges (Bacq, Geoghegan, Josefy, Stevenson, & Williams, 2020). Social enterprises strive to couple entrepreneurship with sustainable

development, offering the potential for the implementation of SDGs. Moreover, social entrepreneurship is defined differently in diverse countries, highlighting the variances in developed and developing country contexts (Starnawska, 2016; Defourny, Mihály, Nyssens, & Adam, 2021). The definitions agree that social enterprises combine business activities with social missions to serve vulnerable people (Defourny et al., 2021; Gigauri, 2022) and help society to transform instead of generating profit for its founders (Martin & Osberg, 2007). Searching innovative solutions, social entrepreneurs achieve scaled social impact (Lubberink, Blok, Van Ophem, & Omta, 2019).

Miller (1983) defined entrepreneurial orientation as "one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with 'proactive' innovations, beating competitors to the punch." Entrepreneurial orientation includes proactiveness, innovation, and risk-taking, and favorably impacts firm performance (Razaei & Ortt, 2018). Entrepreneurial orientation includes "processes, practices, and decision-making activities" (Lumpkin & Dess, 1996), leading to innovations and defining the market potential of a company (Kiyabo & Isaga, 2020).

Although sustainable development encompasses social, environmental, and economic aspects to be balanced, the sustainability concept is described as maintaining "critical natural capital intact for transferal to future generations" (Reijnders, 2021), taking into account that natural resources cannot be substituted by economic resources. For example, forests can be a source of raw material for business, but simultaneously they are the only non-substitute source of oxygen and biodiversity (Singh, Murty, Gupta, & Dikshit, 2009; Geissdoerfer, Savaget, Bocken, & Hultink, 2017). Therefore, the substitutability of natural resources by human-made capital is restricted, but, on the other hand, the "substitution of manufactured capital by natural capital" is possible (Reijnders, 2021). Accordingly, a long-lasting negative impact on natural capital would occur if human-made capital substitutes natural capital, and hence, this would be unjust towards future generations due to the unfair distribution of natural resources between generations (Reijnders, 2021). In this regard, sustainable development centers on sustainability in entrepreneurship activities. Sustainable entrepreneurship pursues economic, ecological, and social goals, which are integrated into business operations. While recognizing and using business opportunities, entrepreneurs must also consider sustainability aspects, as "business as usual" is no longer acceptable (and effective) these days. Thus, sustainability in entrepreneurship means implementing entrepreneurial activities without damaging the environment.

To address the gap in the literature regarding the relationship between sustainability and entrepreneurship, the study answers the following research question (RQ):

RQ: What is the association between entrepreneurship and sustainable development in emerging countries?

The aim of the paper is to investigate the correlation between sustainable development and entrepreneurship in emerging countries. In order to achieve the research objective, relevant literature was reviewed, and a bibliometric analysis was conducted. Further, hypotheses were formulated and tested. The paper discusses the variables reflecting entrepreneurship in emerging economies and its connection with sustainable development.

This paper is divided into six sections. After the introduction, the relevant literature on entrepreneurship and sustainability in emerging countries is reviewed. The section is concluded by hypothesis formulation and bibliometric analysis. Next, data and methodology are described, followed by empirical results and a discussion of the results. The final section provides conclusions highlighting the research implications on theory and practice, including limitations and suggesting future research avenues.

LITERATURE REVIEW

Entrepreneurship and sustainable development

Sustainable development is an important concept for business and policy, reflecting the progress on pressing environmental issues such as ecosystem degradation and climate change. It is defined as the development meeting the needs of the present, but also protecting Earth's life-support system in order to assure the welfare of current and future generations (Griggs et al., 2014). As the laws of physics will not change (Foley, 2017), the solution is that society respects the boundaries of the "safe operating space" (Rockström et al., 2009; Steffen et al., 2015) and limit harmful emissions (Hummels & Argyrou, 2021). Although "sustainability is a pluralist concept" (Byrch, Milne, Morgan, & Kearins, 2015), broadly, it focuses on the triple bottom line suggesting that economic growth, flourishing society, and protecting the environment can be accomplished simultaneously (Larsen, 2008). In this sense, it unifies economic, social, and ecological concerns and proposes a new way of thinking that recognizes the world as interconnected between nature, society, and the economy (Hopwood, Mellor, & O'Brien, 2005).

Sustainable development is defined as "to meet the needs and aspirations of the present without compromising the ability to meet those needs of the future" (UN, 1987).

Regarding this, entrepreneurship represents a significant driver in the process of transformation towards sustainable products and services (Hall, Daneke, & Lenox, 2010), being seen as a universal solution for many social and environmental concerns (Brugmann & Prahalad, 2007; Arthus-Bertrand & Handy, 2003; Senge, Lichtenstein, Kaeufer, Bradbury, & Carroll, 2007; Hart & Milstein, 1999; Wheeler et al., 2005). Thus, entrepreneurship represents a way to ameliorate and improve environmental and social disruptions (Cohen & Winn, 2007; Hall & Vredenburg, 2003; Gigauri, 2022; Hart & Milstein, 1999; Hart & Christensen, 2002; Senge & Carstedt, 2001; Coase, 1974; North & Thomas, 1970; Demsetz, 1970; Pigou, 1912).

Entrepreneurship has a significant role in business, but not necessarily a productive one (Baumol, 1990), being influenced by "information asymmetry and prior knowledge," "social networks," "the entrepreneur' personality traits" and/or "type of opportunity" (Ardichvili, Cardozo, & Ray, 2003). In the process of change and societal transformation, entrepreneurs are motivated by environmental degradation and supply entrepreneurial opportunities, which generates profit and improvements in social welfare (Dean & McMullen, 2007). Thus, entrepreneurship is providing institutional change and societal transformation (Santos, 2012; Stål & Bonnedahl, 2016; Salmivaara & Kibler, 2020), being very important to establish an equilibrium between the demands of the economy and the ecological support systems.

Shepherd and Patzelt (2011) highlighted that "the mechanism of inducing change" is based both on "what is sustained and what is developed." What is to be sustained is referring to environment-friendly institutions, community-based institutions, and institutional trade-offs and what is to be developed is referring to economic benefits, and non-economic gains for others. Therefore, entrepreneurship involves the simultaneous presence of profitable opportunities and of enterprising individuals (Venkataraman, 1997), with a positive social impact on the achievement of sustainable development goals (Seelos & Mair, 2004). The efficacy of the entrepreneurial activity is significantly influenced by the nature of market impulses, known in the literature as the prisoner's dilemma. In this context, entrepreneurs are facing disagreements between individual rewards and collective goals in order to achieve sustainable development, being compelled to environmentally degrading behavior (Pacheco, Dean, & Payne, 2010).

Entrepreneurial collaboration influences sustainability in three ways: first, for cross-actor participation within entrepreneurial processes; second, for coordinating across sustainability issues and between entrepreneurial

solutions; and third, for cross-sector cooperation between different forms of entrepreneurship, the collaborative entrepreneurship being linked with sustainable development (Schaltegger, Beckmann, & Hockerts, 2018).

Entrepreneurship positively influences economic growth and, respectively, job creation and social well-being (Audretsch & Keilbach, 2004; Audretsch, 2005; Alpkan, Bulut, Gunday, Ulusoy, & Kilic, 2010; Acs, Audretsch, Braunerhjelm, & Carlsson, 2012; Méndez-Picazo, Galindo-Martín, & Ribeiro-Soriano, 2012; Nissan, Galindo, & Picazo, 2012; Castaño, Méndez, & Galindo, 2016; Doran, McCarthy, & O'Connor, 2018; Stoica, Roman, & Rusu, 2020; Gigauri, Panait, Apostu, & Raimi, 2022). The increased interest in environmental problems contributes to develop activities that respect the environment, being a stimulating factor for sustainable development (Méndez-Picazo, Galindo-Martín, & Castaño-Martínez, 2021; Panait, Hysa, Petrescu, & Fu, 2022). Entrepreneurship is considered an alternative to unemployment and poverty, being a panacea for development (Bogan & Darity, 2008; Apostu, Mukli, Panait, Gigauri, & Hysa, 2022), significantly contributing to achieving sustainable growth, and together with small businesses it represents the basics of economy (İyigün, 2015).

A key factor for entrepreneurship is represented by innovation, representing a continuous, systematic activity that focuses on the entire organization, including its organizational forms and methods (Sawhney, Wolcott, & Arroniz, 2006; Hamel, 2006). Innovation has an impact on the capacity of an organization to support its competitive advantages, and helps the organization provide better answers to rapid and sudden changes within the market and economy (Du, Bhattacharya, & Sen, 2011; Flammer, 2015; Wadhwa & Kotha, 2006; Miller, Fern, & Cardinal, 2007). It is based on policy tools or measures that are very important for the transition of society and the economy to sustainability (Ionescu et al., 2020). In order to achieve sustainable development, an association between entrepreneurship and innovation is necessary (Iqbal, Khan, Gill, & Abbas, 2020). The recognition of entrepreneurship as a solution to environmental degradation and social inequality led to the appearance of a new type of entrepreneurial activity, namely sustainable entrepreneurship (Muñoz & Cohen, 2018). Sustainable entrepreneurship alludes to entrepreneurial actors who can achieve economic returns by exploiting environmentally relevant market failures (Dean & McMullen, 2007).

Social enterprises are emerging as a source to solve pressing social and environmental problems through their value-based business approach and step forward to mitigate the impact of health and economic crises while contributing to economic growth and promoting social equality (Gigauri et al., 2022; Gigauri & Bogacz-Wojtanowska, 2022). Through innovative

solutions, social enterprises address sustainable development goals and create social impact while raising awareness among investors and the public (Gigauri et al., 2022).

Although new ventures are considered a solution to social and ecological challenges (Hall et al., 2010), there are differences in this respect among developed and developing countries. Sustainability damages are often found in developing economies due to their weak regulation systems and unsustainable business practices (Kshetri, 2021; Fikru, 2014). Moreover, effective mechanisms forcing sustainable activities in developed countries cannot be effective in emerging markets (Kshetri, 2017). Furthermore, technological progress enabling sustainable entrepreneurship is more developed in advanced economies but shows great promise for emerging countries (Kshetri, 2021). In addition, sustainable entrepreneurship can be attractive for developing economies only if it contributes to economic growth, which is seen as the main possibility to increase the welfare of a country (Hall et al., 2010).

Entrepreneurship in emerging countries

Emerging countries are very important in the current economic scenario, representing approximately half of both the world population and the global gross product (Casanova & Miroux, 2017). Even though, the observed growth of these countries has registered a downward trend since 2013 due to the global financial crisis that started in 2008 (Kantis, Federico, & García, 2020). Emerging economies are characterized by an increasing market orientation and an expanding economic foundation, many of these are becoming major economic forces in the world and entrepreneurship is playing a key role in this economic development (Bruton, Ahlstrom, & Obloj, 2008). In developing countries, entrepreneurship must enhance at the same time economic growth, advance environmental objectives, and improve from a social point of view. Dhahri and Omri (2018) studied entrepreneurial activity in emerging countries, highlighting a positive influence to the economic and social dimensions of sustainable development, and a negative contribution to the environmental dimension.

Entrepreneurship education is a must for sustainable development, providing the youth with the needed entrepreneurial skills in order to be self-reliant. Governments should also be included in entrepreneurial development by giving adequate attention through the requirements of a good economic environment (Arogundade, 2011; Gigauri, 2022). Lourenço, Jones, and Jayawarna (2012) examined attitudes to an entrepreneurial form of sustainability education, indicating a strong relationship between the

perception of learning benefits and the intentions of aborning entrepreneurs to achieve a profit. The first mentality is negatively associated with perceptions of benefit; instead, learning is not affected.

Emerging countries are characterized by a "youth bulge," meaning a population dominated by young people. Thus, governments must take appropriate measures in order to make the best benefit of this young population, otherwise, the results will be a rising trend regarding unemployment (Zaki & Rashid, 2016), leading to an unemployed young population becoming entrepreneurs. Thus, the emerging economies are confronted with a high level of entrepreneurship due to less difficult entry barriers and high levels of need for entry, particularly in the informal sector (Omri, 2020).

The emerging markets are associated with high institutional uncertainty, which can be a barrier to entrepreneurship, but they also provide important opportunities for entrepreneurs (Tracey & Phillips, 2011). Kirzner (1992) considers that a free market encourages entrepreneurship from a legal, political, constitutional, and economic perspective. In emerging countries, liberalized environments lead to improved business climates (Okoroafo, 1993) and a free market representing an instrument for entrepreneurial activity (Herrera-Echeverri, Haar, & Estévez-Bretón, 2014). Entrepreneurial activities are significant in emerging economies due to an increasingly market orientation and an expanding economy, with entrepreneurship playing a key role in economic development (Ahlstrom & Bruton, 2008; Bruton et al., 2008).

Another important factor regarding entrepreneurship in emerging countries is reflected by good government (Ong, 2006), which has recently become a buzzword both for scholars and political decision-makers (Omri, 2020). Ahlstrom and Bruton (2006) highlighted that in the case of emerging economies, fundamental and comprehensive institutional transformations are encountered as their economies grow.

Thus, formal entrepreneurship is encouraged by several factors, such as good economic and political institutions, efficient regulation of the economy, and well-defined property rights and solid laws (Havrylyshyn, 2001; Kaufmann, Kraay, & Mastruzzi, 2006). Although there are numerous studies confirming governance quality which significantly influences entrepreneurship activities in emerging countries, in the case of economies in their early stages of development , the improvement of governance quality does not lead to encouraging people to register their businesses (Thai & Turkina, 2014).

Governments of emerging economies are interested in startups and young firms as they are potential engines of economic growth and structural transformation (Gries & Naudé, 2010). Although there is a high interest in this topic, there is not so much research in the literature (Acs & Amoros,

2008; Bruton et al., 2008; Kantis, 2005; Smallbone, Welter, & Ateljevic, 2014), thus policymakers are not provided with a clear evidence-based platform in order to design their policies and programs.

Due to intense global competition, rising market volatility, constantly changing consumer demand, and shortened product life cycles, companies all over the world are being affected, with disruptive innovation and disruptive innovation-based entrepreneurship becoming strategic means to achieve sustainable company growth and competitiveness (Si, Zahra, Wu, & Jeng, 2020), especially in emerging countries.

Reviewing the above entrepreneurial literature in emerging countries, it is also noteworthy that there are not only differences between developed and emerging countries, but also within developing countries in terms of their economic development, legislation, education, demographical conditions, access to finances, technological advancement, or innovativeness. Besides, attitudes towards entrepreneurship can vary, leading to entrepreneurial motivation. However, our study focuses on emerging countries, assuming they share one important similarity: developing economies.

HYPOTHESIS FORMULATION

Entrepreneurs' solutions to environmental degradation

Entrepreneurship has a vital role in solving the environmental challenges the world is facing. The traditional theory regarding the environment and welfare indicates that market failures in the economy impede entrepreneurial activities to solve environmental problems, motivating environmentally degrading entrepreneurial behaviors (Pigou, 1932; Tietenberg, 2000; Cropper & Oates, 1992; Bator, 1958). There are also authors considering entrepreneurship as a modality of solving market failure problems (Coase, 1974; Buchanan & Faith, 1981; North & Thomas, 1970, Demsetz, 1970) and, respectively, issues related to the environment (Anderson & Leal, 1997, Anderson & Leal, 2001). Regarding this, York and Venkatatraman (2010) contradicted the idea that entrepreneurs cause environmental degradation, launching solutions for this issue.

In this context, environmental entrepreneurship was born as a subset of sustainable entrepreneurship, representing the entrepreneurial action that solves environmental challenges. Thus, entrepreneurial action can lead to achieving ecological sustainability (Dean & McMullen, 2007). Despite social entrepreneurship, which tends to address mission-driven instead of profit-driven entrepreneurial endeavors (Dees, 2001; Mort, Weerawardena, & Carnegie, 2006), sustainable entrepreneurship is characterized by its

alleviation of environmental market failures through the exploitation of profitable opportunities (McMullen, 2007).

The entrepreneurs' motivations for pursuing sustainable activity

Although many discussions deal with the factors motivating entrepreneurs to undertake sustainable ventures (Schaltegger, 2002), there are only a few studies on this issue (Schlange, 2006). Walley and Taylor (2002) referred to a typology founded in entrepreneurship theory (Thompson, 1998; Post & Altmann, 1994; Giddens, 1984). Based on the external and internal influences on observed entrepreneurial behavior, four ideal types of "green entrepreneurs" are concluded. The external factors are characterized as "soft" (personal networks) as opposed to "hard" structural influences (economic structure of society). The internal factors of the entrepreneur vary between predominating economic objectives with no green orientation and a sustainability orientation. In this context, green entrepreneurs register different levels of commitment to sustainability issues and their motivation can be differentiated along distinct context variables (Schaltegger, 2002). Parrish (2010) highlighted the fact that entrepreneurs are motivated by opportunity-driven variables in order to build a profitable activity and by sustainability-driven variables with the aim to achieve profit objectives.

The external drivers are: geographical influence (Linnanen, 2002), market choice (the reason for market emergence) (Schaltegger, 2002), and structural influences (degree of enforcement of environmental standards) (Walley & Taylor, 2002). The internal factors are deduced from the entrepreneurial motivation structure: sustainable entrepreneurs following their desire to change the world, make money, or combine both (Schaltegger, 2002). The internal factors are: priority of environmental business goals (Schaltegger, 2002), orientation of entrepreneurial mindset (Walley & Taylor, 2002), and entrepreneurs' desire (Linnanen, 2002).

Sustainability orientation leads to entrepreneurial propension

In the literature we found that entrepreneurship is very important for sustainable development because entrepreneurs will follow entrepreneurial opportunities caused by market imperfections to achieve entrepreneurial rents (Kuckertz & Wagner, 2010). The entrepreneurial opportunities based on market imperfections are not always the same as those promising the highest entrepreneurial rents (Dean & McMullen, 2007).

Entrepreneurial intentions and behavior were associated with individual personality (Baum, Frese, & Baron, 2007), self-efficacy, risk-taking propensity,

or optimism (Fraser & Greene, 2006; Rauch & Frese, 2007). In the case of sustainable development, the individual's sustainability orientations are the result of the individual's interests in understanding the emergence of organizations (DiMaggio, 1988).

People concerned about environmental problems act according to their values and engage in voluntary actions (Bruyere & Rappe, 2007). In some cases, policy makers can solve market imperfections, but in other cases, they are associated with entrepreneurial opportunities (Cohen & Winn, 2007; Dean & McMullen, 2007). Thus, individuals interested in sustainability will be predisposed to accept entrepreneurial opportunities resulting from unsustainable economic behavior, as the perception of entrepreneurial opportunities depends on prior individual knowledge (Shane, 2000). Zahra, Gedajlovic, Neubaum, and Shulman (2009) consider that opportunities for sustainable entrepreneurship might not be seen as opportunities, in some cases being hard to be distinguished, sustainability orientation being ascribed to entrepreneurs as individuals rather than to businesses (Kuckertz & Wagner, 2010).

The orientation towards sustainability includes attitudes and personal traits on social responsibility and environmental protection (Sung & Park, 2018; Popescu, Hysa, & Panait, 2022). In what concerns the individual level, the orientation to sustainability is reflected by the proactive orientation toward societal and environmental issues of a business owner or manager (Diehl, Greenvoss, & Klee, 2015). In the case of business, the sustainability orientation reflects a company's philosophy of doing business in a socially and environmentally sustainable way (Roxas & Coetzer, 2012), leading to competitive advantage and superior financial performance (Claudy, Peterson, & Pagell, 2016).

According to Tran and Von Korflesch (2016), entrepreneurial behavior can be predicted using intentions. The Theory of Planned Behaviour (TPB) claims that intentions can be useful in order to predict actual behavior (Ajzen, 1991), using TPB the actual entrepreneurial behaviors (Hockerts, 2017) and human behavior (Armitage & Conner, 2013; Yuzhanin & Fisher, 2016) can be predicted.

The attitude towards sustainability and perceived entrepreneurial desirability enhances sustainability-oriented entrepreneurial intentions (Vuorio, Puumalainen, & Fellnhofer, 2018). Kuckertz and Wagner (2010) indicated a positive relationship between sustainability orientation and entrepreneurial intention. Instead, business experience negatively influences this relationship.

Based on the extant literature, the following hypotheses were formulated:

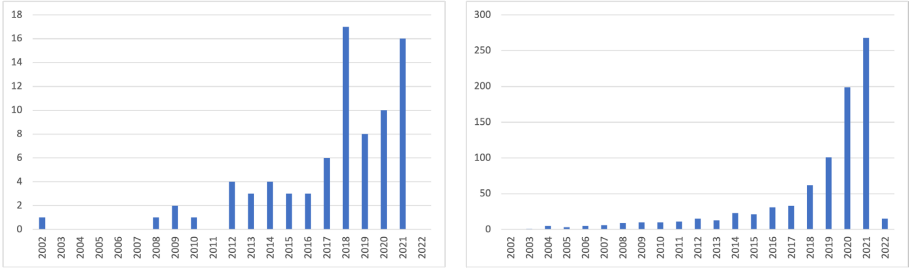
H1: Entrepreneurship significantly influences sustainable development in emerging countries.

H2: Sustainable development significantly influences entrepreneurship in emerging countries.

Bibliometric analysis on entrepreneurship in sustainable development in emerging countries

Bibliometric analysis represents a quantitative study of bibliographic material in order to provide a general picture of a research topic (Merigó & Yang, 2017). It is an integral part of research evaluation methodology, mainly within the scientific and applied fields (Ellegaard & Wallin, 2015). Norton (2010) defines bibliometrics as the measurement of texts and information. Using bibliometrics, Porter, Watts, and Anderson (2003), Porter and Watts (2005), and Pilkington (2003) identified hidden patterns by classifying information. Therefore, we used bibliometric analysis to create a comprehensive image of the literature regarding entrepreneurship in sustainable development in emerging countries. We investigated all published papers in the Web of Science database related to the association of the words: "entrepreneurship," "sustainable development," "emerging countries," the result being represented by 79 articles from 2002 until 2021.

As shown in Figure 1, the number of published papers and citations illustrates a hyperbolical progression. There is a jump in the number of publications after 2012 and a rise in the number of citations after 2018. Thus, there has been a growing interest in the field in the last decade, with the main focus being on entrepreneurship for sustainable development.



a) Publications b) Citations

Figure 1. Dynamics on (a) publications and (b) citations in the field

Source: Authors' selection from WoS database, based on selected words, using Excel.

Analyzing a country's interest for the 'entrepreneurship in sustainable development in emerging countries' topic, the most influential countries in the field are countries in cluster 1 (Figure 2). The top five productive countries of publication are: the UK, China, USA, India, and Spain, registering the most participation in the field, with 9, 8, 8, 7, and 6 papers, respectively.

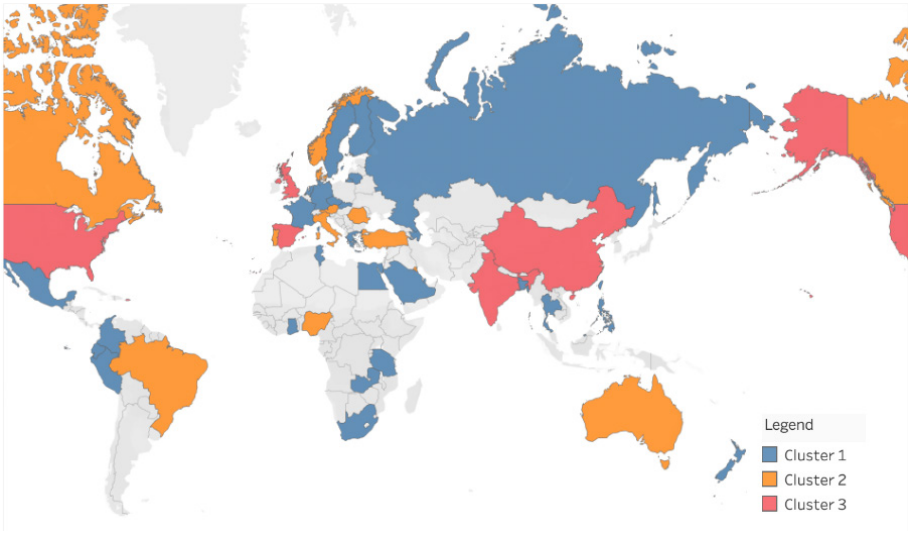


Figure 2. Country analysis

Source: Authors' selection from WoS database, based on selected words, using Tableau.

Exploring the amount of information offered by the word clouds, we tried to identify the most common words found in the scientific articles. The co-occurrence of authors' words in the publications is investigated, taking into account a frequency of at least eight times, using a correlation degree greater than 0.5 and a threshold of 0.5. The analysis has been done using the VOS programme.

In order to recognize the common words, we used cluster analysis on a keyword network, which was extracted from the papers. The results are presented in Figure 3, highlighting the words that record the highest frequencies of occurrence, which, apart from the keywords used, are: opportunity, innovation, knowledge, strategy, network, and challenge.

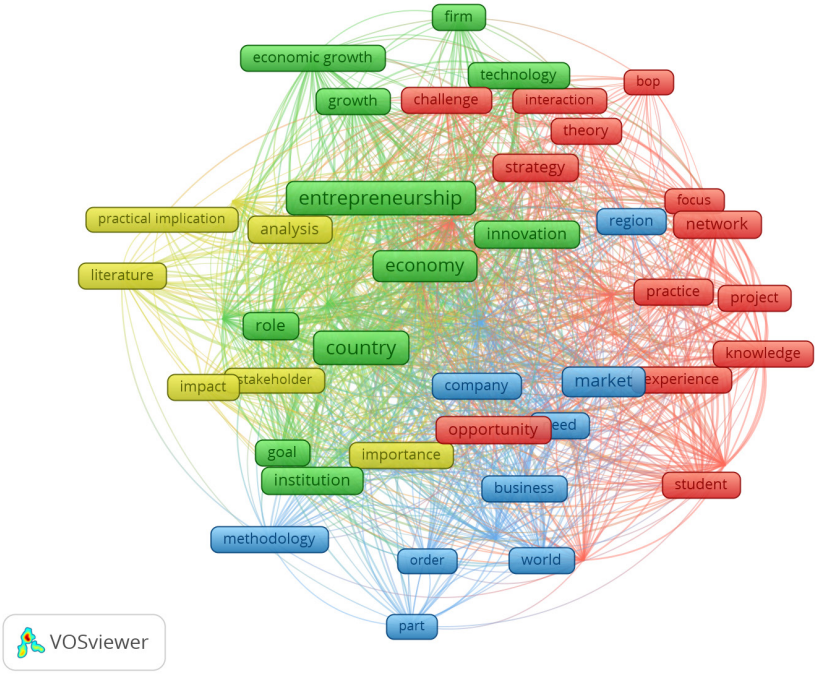


Figure 3. Most common words and word network in scientific publications' content

Source: Authors' selection from WoS database, based on selected words, using VOS program.

The combinations of words most encountered were explored by the most correlated words within the selection of articles. The empirical results (Figure 3) highlighted four significant clusters of the most common combinations in the selected 79 studies in the field. These are:

- Cluster 1: bop, challenge, education, entrepreneur, experience, focus, interaction, knowledge, network, opportunity, practice, project, relationship, society, strategy, student, theory;
- Cluster 2: country, economic growth, economy, entrepreneurship, firm, goal, government, growth, innovation, institution, perspective, role, technology;
- Cluster 3: business, company, creation, market, methodology, need, order, part, person, region, sustainable development, world;
- Cluster 4: analysis, development, economic development, factor, impact, importance, literature, practical implication, stakeholder.

As can be observed from the four clusters, the most encountered words are related to entrepreneurship and sustainable development.

DATA AND METHODOLOGY

To identify whether entrepreneurship influences sustainable development in emerging countries, we used the following variables: new business density rate, total business density rate, closed business density rate (reflecting entrepreneurship), and SDG index (representing sustainable development) for 29 countries for the period 2009–2020. The source data is represented by the World Bank database and Sustainable Development Report. A short description of the variables is presented in Table 1.

Table 1. Variables description

Variables	Variables description	Source
CBDR	The number of deregistered firms with limited liability per 1,000 working-age people (ages 15-64)	https://www.worldbank.org/en/programs/entrepreneurship/methodology
NBDR	New business density (new registrations per 1,000 people ages 15-64)	https://data.worldbank.org/indicator/IC.BUS.NDNS.ZS
TBSR	The total number of registered firms with limited liability per 1,000 working-age people (ages 15-64)	https://www.worldbank.org/en/programs/entrepreneurship/methodology
SDG	The overall score measures the total progress towards achieving all 17 SDGs	https://dashboards.sdgindex.org/rankings

For highlighting the variables on entrepreneurship influencing the SDG index in the emerging countries panel regression (static model) was used, being specified as follows:

$$Y_{it} = c + \sum_{j=1}^{J} \beta_i X_{it}^{j} + \sum_{k=1}^{K} \beta_k Z_{it}^{k} + \sum_{l=1}^{L} \beta_l W_{it}^{l} + e_{it} \quad (1)$$

where Y, X, W, and Z are different vectors of pull and push determinants.

To test the variables' stationarity, the study used the Levin, Lin, and Chu – LLC (Levin et al., 2002), Im, Pesaran and Shin W-Stat - IPS (Im et al., 2003), ADF-Fisher Chi-Square, and PP-Fisher Chi-Square tests. In order to investigate

the existence of structural breaks, the robustness was checked both on single cross-section units and on the whole panel dataset.

Referring to the Static Panel data model, three different methods can be detected: Common Constant, Fixed Effects, and Random Effects. The Common Constant method considers no differences among the data matrices of the cross-sectional dimension (N). In the case of the Fixed Effect Model (FE), differences between units can be accommodated from different intercept. In the case of the Random Effects Model (RE), interference variables may be interconnected between time and units (Apostu et al., 2022).

To select between random and fixed effects, the Hausmann test was used to detect the presence of statistically significant unobserved fixed effects (Hausman, 1978). Robustness checks (heteroskedasticity of residues, autocorrelation of residues and dependence of residues between the panels) was conducted by the Wooldridge autocorrelation test (Wooldridge, 2002) and Wald test (heteroskedasticity of residues), Pesaran test (dependence of residues between the panels) and Greene heteroscedasticity test (Greene, 2003) and LM test (autocorrelation of residues). We used Eviews 13 Student version to estimate the analysis models.

RESULTS

To answer the research objectives related to the determinant factor in the emerging countries related to SDG, we used a panel data equation model as follows:

$$SDG_{it} = c + \sum_{j=1}^{J} \beta_i \, NBDR_{it}^{j} + \sum_{k=1}^{K} \beta_k \, TBSR_{it}^{k} + \sum_{l=1}^{L} \beta_l \, CBDR_{it}^{l} + e_{it} \quad (2)$$

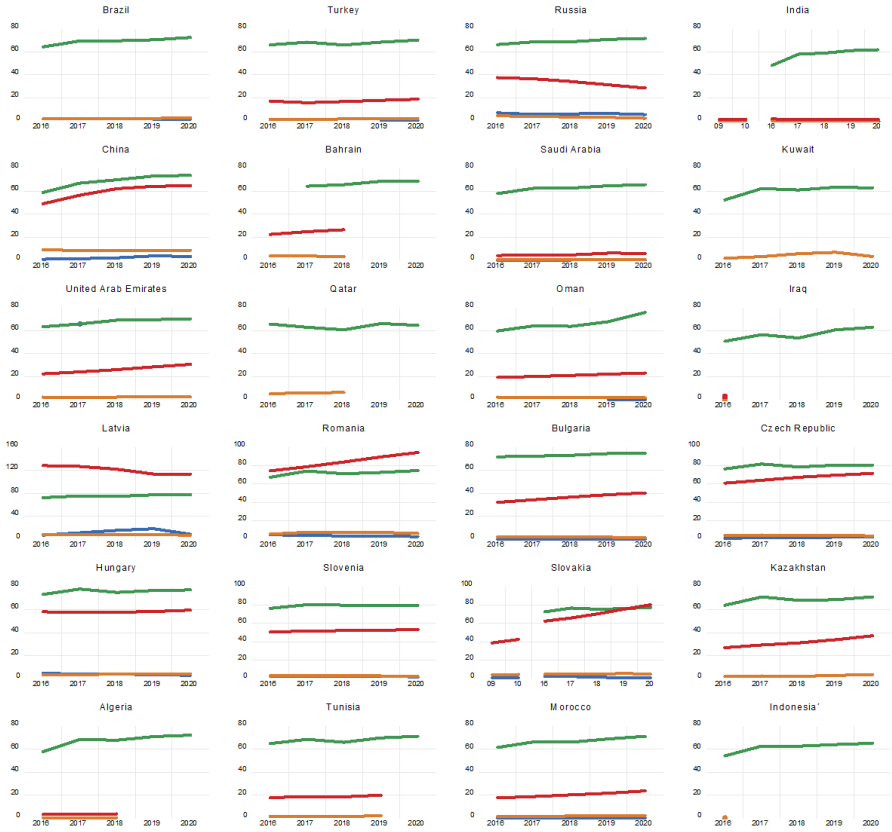
The dependent variable is represented by the SDG index. The explanatory variables included in the regression equations are: new business density rate (NBDR), total business density rate (TBSR), and closed business density rate (CBDR).

In order to examine the characteristics of the countries included in the sample, descriptive analyses of the data were conducted (Table 2). The average CBDR in the sample is 3.46%, varying from 0.02% and 66%, with a standard deviation of 8.32%. The minimum value for NBDR is 0.15%, the maximum value is 10.66%, the mean value is 4.17%, and the standard deviation is 2.79%. TBSR oscillates between 1.45% and 128.56%, with a standard deviation of 32.81% and a mean of 51.38%. The SDG index registers the lowest value of 57.20 and the highest value of 81.90. The average value for the sample is 71.79, and the standard deviation of 5.78.

Table 2. Summary statistics of dependent and explanatory variables

Variables	CBDR	NBDR	TBSR	SDG
Mean	3.457	4.169	51.375	71.789
Min.	0.015	0.1531	1.453	57.200
Max.	66.000	10.656	128.562	81.900
Std. Dev.	8.318	2.788	32.814	5.782

As we can see in Figure 4, the trends for the variables in the sample are slightly different, but in most of the cases, SDG registers an ascending trend, concluding that all countries have taken measures in order to achieve sustainable development goals.



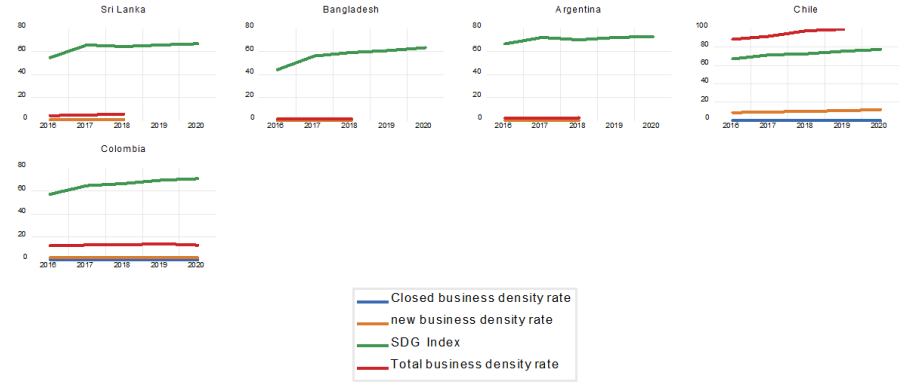


Figure 4. Trends regarding the variables in the analysis

An important step is identifying the cross-sectional dependence between variables, and for this, we performed the Pesaran cross-sectional dependence test (Table 3). The results conduced to reject the null hypothesis, thus, there is no cross-sectional dependence, i.e., the variables are not correlated to each other.

Table 3. Results from cross-sectional dependence test

Test	Statistic	Prob.
Breusch-Pagan LM	1406.887	0.0000
Pesaran LM normal	35.124	0.0000
Pesaran CD normal	35.232	0.0000

The stationarity of the variables was tested through unit root tests using the augmented Dickey–Fuller and Im, Pesaran, and Shin unit root tests. The variables CBDR and SDG are stationary at level and the variables NBDR and TBSR are stationary after the first difference for a probability of 95%, registering a value of less than 0.05 (Table 4).

In order to check causality, the Granger causality test is employed (Table 5). The result confirmed the role of CBDR on NBDR, but not vice versa. CBDR and NBDR cause TBSR, and CBDR causes SDG for the countries in the sample. This can be explained by the fact that total business density rate and closed business density rate have an influence on the sustainable development index, thus, sustainable development represents the result of density rate for enterprises and closed enterprises. Instead, sustainable development does not cause changes in entrepreneurship in the case of emerging countries.

Table 4. Unit root tests for the full sample

Variables	Levin, Lin & Chu		Im, Pesaran & Shin W-Stat		ADF-Fisher Chi-Square		PP-Fisher Chi-Square	
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
CBDR	-2.682	0.004	-0.161	0.436	26.590	0.431	34.902	0.114
NBDR - level	2.553	0.995	2.637	0.996	31.545	0.881	40.926	0.518
NBDR - first difference	-15.052	0.000	-34.077	0.000	92.616	0.000	106.441	0.000
TBSR - level	5.599	1.000	3.182	0.999	35.596	0.581	54.513	0.040
TBSR - first difference	-11.789	0.000	-77.821	0.000	63.262	0.002	70.843	0.000
SDG	-19.426	0.000	-9.311	0.000	146.899	0.000	175.401	0.000

Table 5. Granger causality results among the variables

Null hypothesis	F-statistic	Prob.
NBDR does not Granger Cause CBDR	1.352	0.279
CBDR does not Granger Cause NBDR	6.449	0.006
TBSR does not Granger Cause CBDR	0.023	0.978
CBDR does not Granger Cause TBSR	9.618	0.001
SDG does not Granger Cause CBDR	0.117	0.890
CBDR does not Granger Cause SDG	2.506	0.097
TBSR does not Granger Cause NBDR	0.749	0.480
NBDR does not Granger Cause TBSR	4.310	0.021
SDG does not Granger Cause NBDR	0.938	0.400
NBDR does not Granger Cause SDG	3.025	0.060
SDG does not Granger Cause TBSR	0.244	0.785
TBSR does not Granger Cause SDG	0.739	0.485

The static results using fixed/random effect estimations are prescribed by Hausman's specification test (Table 6), highlighting random effect estimates are appropriate due to accepting the null hypothesis of random effect applicability. The results are also confirmed by the Redundant Fixed Effects Test.

Static results (Table 7) indicated that the SDG index is significantly influenced by the total business density rate in emerging countries, with the correlation between them being negative. Instead, new business density rate and closed business density rate do not influence sustainable development in the emerging countries.

Table 6. Correlated random effects - Hausman test

Test summary	Chi-Sq. Statistics	Chi-Sq. d.f.	Prob.
Cross-section random	**2.420**	**3**	**0.489**

Cross-section random effects test comparisons

Variables	Fixed	Random	Var (Diff.)	Prob.
CBDR	-0.234	-0.084	0.071	0.574
D(NBDR)	-0.161	-0.290	0.077	0.641
D(TBSR)	-0.351	-0.295	0.002	0.259

Table 7. Static panel results

Variables	Coefficients	Std. Error	t-Statistic	Prob.
CBDR	-0.084	0.082	-1.022	0.311
D(NBDR)	-0.290	0.623	-4.466	0.643
D(TBSR)	-0.295***	0.110	-2.677	0.010
Intercept	72.808	1.379	52.789	0.000
R2	0.125			
F-statistic	2.579			
Prob (F-statistic)	0.063			
Applicability of model	Random effects			
No. of observations	85			

Note: *** - 1% significance level.

Also, the following assumptions were verified: heteroskedasticity of residues (Wald test); dependence of residues between the panels (Pesaran test) and autocorrelation of residues (LM test). In order to test the normality of the residuals, we used the histogram (Figure 5). According to it, it is depicted that the residuals are normally distributed because the Jarque-Bera test value is 2.267, which is found to be non-significant at the 5% level of significance.

Therefore, the analysis results indicate that entrepreneurship significantly influences sustainable development, confirming H1. Instead, sustainable development does not cause an increase in the case of variables reflecting entrepreneurship in emerging countries, invalidating H2.

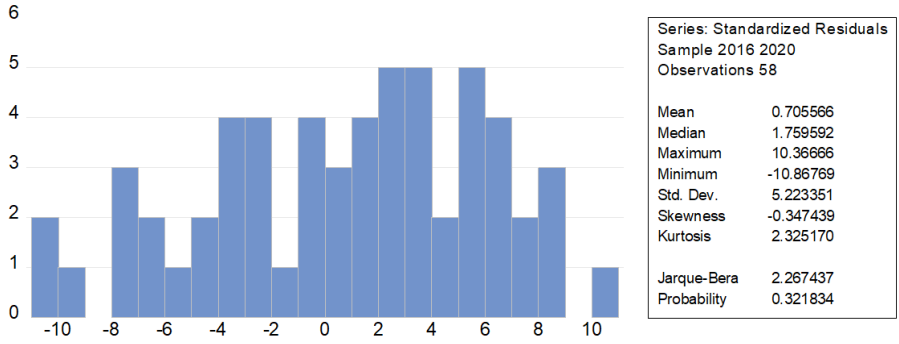


Figure 5. Characteristics of residuals based on the random-effects model

DISCUSSION

Since sustainable concerns are becoming of great significance, society anticipates that entrepreneurial practices focus on balancing sustainability and profitability (De Clercq & Voronov, 2011). Consequently, entrepreneurship must take into consideration sustainability development while striving for financial gains. Furthermore, enterprises play an important role in economic development, especially in emerging markets. Developing countries offer a dynamic environment for investment and entrepreneurial potential. Entrepreneurs are motivated to change and improve the existing situation. Accordingly, entrepreneurship, seen as an economic driver for development and transformation, requires that governments support entrepreneurial ecosystems in order to fully realize their developmental potential and facilitate economic growth (e.g., Kantis et al., 2020; Audretsch & Keilbach, 2004; Alpkan et al., 2010; Nissan et al., 2012; Stoica et al., 2020).

The results of our research suggest that entrepreneurship significantly influences sustainable development. All emerging countries in our sample have taken actions to achieve sustainable development goals. The findings are in line with previous studies emphasizing the positive impact of entrepreneurship on economic and social aspects of sustainable development (e.g., Dhahri & Omri, 2018; Hall et al., 2010). These results also confirm the contribution of entrepreneurship to sustainable development goals (Seelos & Mair, 2004). It should be noted that although the results show that entrepreneurship significantly influences sustainable development, the concept of sustainable development affects entrepreneurship as sustainability influences almost all domains of today's society. Moreover, social and sustainable enterprises, generating social impact, are the reflection of such an influence.

In addition, sustainable development goals (SDGs) imply to enterprises to operate in harmony with the environment preventing unsustainable use of natural resources. Our research results indicate that total business density in emerging economies influences the SDG index. However, sustainable development does not lead to increases in variables reflecting entrepreneurship in emerging countries. This result indicated that, in the case of emerging countries, sustainability does not influence entrepreneurship. Our study presents the relationship between sustainable development and entrepreneurship in the short term.

Prior studies also demonstrated a negative influence of entrepreneurial activities on the environmental dimension of sustainability (e.g., Haldar, 2019; Ben Youssef, Boubake, & Omri, 2018; Dhahri & Omri, 2018). Yet, entrepreneurship positively affects sustainable development in the case of innovation and new technologies (e.g., Ben Youssef et al., 2018; Iqbal et al., 2020).

Moreover, innovation is pivotal for enterprises in developing countries to achieve multiple ends of sustainability. It is an impetus for the growth of entrepreneurship and the implementation of sustainability (e.g., Ben Youssef et al., 2018). In this regard, sustainable entrepreneurship is becoming prevalent to address environmental and market issues (Sung & Park, 2018; Muñoz & Cohen, 2018; Dean & McMullen, 2007). Our research resonates with the literature suggesting the values that bring about sustainable entrepreneurship and that entrepreneurs should have multiple goals for the *raison d'être* of their enterprises (Haldar, 2019).

Since the research results indicate that entrepreneurship significantly influences sustainable development confirming the previous findings (e.g., Sung & Park, 2018; Seelos & Mair, 2004), entrepreneurship education should concentrate on sustainability issues, teaching business and management from the lens of SDGs (Ortiz-de-Urbina-Criado, Mora-Valentín, & Nájera-Sánchez, 2022; Lourenço et al., 2012). Moreover, sustainability-focused individuals can better recognize entrepreneurial opportunities (Sung & Park, 2018; Nordin, Ravald, Möller, & Mohr, 2018; Parrish, 2010; Baum et al., 2007).

CONCLUSION

This paper attempted to offer a better understanding of the links between sustainable development and entrepreneurship in emerging countries. The aim of this research was to identify the impact of sustainable development on entrepreneurship and vice versa. Research findings clearly showed that entrepreneurship considerably influences sustainable development. According

to Granger causality, closed business density rate causes new business density rate, but new business density rate does not cause closed business density rate. Closed business density rate and new business density rate cause total business density rate and closed business density rate causes sustainable development goals for the countries in the sample. These results reflect the fact that in the case of emerging countries, the density rate for enterprises and closed enterprises generate changes in sustainable development. Instead, sustainable development does not cause changes in entrepreneurship. To establish the relationship between sustainable development and entrepreneurship, panel regression was also used, the dependent variable being the sustainable development index and the independent variables: new business density rate, total business density rate, and closed business density rate. According to the Hausman test and Redundant Fixed Effects test, the model considered random effects. The results of the regression analysis indicate that the SDG index is significantly influenced by total business density rate in emerging countries, the correlation between them being negative. Instead, new business density rate and closed business density rate do not influence sustainable development in emerging countries.

This research supports the results of other studies and has implications for the theory and practice of entrepreneurship. It contributes to the existing literature by exploring the influence of entrepreneurship on sustainability in emerging economies. The results can be used by governments and policymakers to plan their strategies and policies concerning entrepreneurship and implementation of sustainable development goals. They should promote entrepreneurial activity and control the negative environmental impact of enterprises simultaneously. For about four decades, scholars have advocated sustainability-driven entrepreneurship, sustainable production, and responsible consumption (Haldar, 2019). If entrepreneurship supports sustainable development, entrepreneurial practice needs to be encouraged. In addition, the adoption of innovation and new technologies should be promoted in enterprises in order to implement sustainability.

Governments in developing countries pay attention to the potential benefit of entrepreneurship to contribute to economic and social development. To realize this strategy, entrepreneurs need a stimulating environment and support from the government. Consequently, policymakers can develop programs to encourage entrepreneurs to build their ventures. Governments can create an enabling environment for entrepreneurs by removing barriers, supporting collaboration, accessing financial resources, and reducing entry regulations and costs for entrepreneurs.

Moreover, entrepreneurial capabilities need to be developed as rapid and constant changes occur. In this regard, education programs should

provide sustainability-oriented teaching in business and management courses. Nurturing an entrepreneurial culture has a crucial role in enhancing entrepreneurial orientation with an emphasis on sustainability.

The authors are aware of the limitations of the research that emerged from the sample of countries, and the indicators used. Given that this study analyzes only the influences of entrepreneurship on sustainability and the impact of sustainable development on entrepreneurship, this relationship could include more variables that must be explored as sustainable entrepreneurship is a complex process. For this reason, this research should be extended by future studies to investigate other factors, including entrepreneurs' behavioral aspects, cultural and country contexts, entrepreneurial intention and sustainability awareness, affecting the correlation between sustainability and entrepreneurship. In addition, further studies will investigate the difference in the relationship between sustainable development and entrepreneurship in developed and emerging countries while taking into consideration the sectoral, geographical, and economic differentiation of this relationship. Another direction considers sustainable entrepreneurship. Sustainable entrepreneurship includes more components, and starting from the idea that entrepreneurship significantly influences sustainable development in the case of emerging countries, future studies will examine sustainable entrepreneurship in terms of motives and behaviors.

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Abstrakt

CEL: *Przedsiębiorczość postrzegana jako motor rozwoju gospodarczego jest szczególnie pożądana dla krajów wschodzących, aby wspierać szybki wzrost. Co więcej, przedsiębiorcy mogą wspierać transformację społeczną na rzecz bardziej zrównoważonych produktów i usług. Zrównoważona orientacja przedsiębiorczości przyczynia się do realizacji celów zrównoważonego rozwoju i zapobiega deprywacji środowiska. Program zrównoważonego rozwoju może również wpływać na przedsiębiorczość.*

METODYKA: *Przeprowadzona analiza bibliometryczna potwierdziła rosnące w ostatnich latach zainteresowanie naukowców korelacją przedsiębiorczości ze zrównoważonym rozwojem. Ponadto regresja panelowa (model statyczny) została wykorzystana do zbadania zmiennych dotyczących przedsiębiorczości wpływających na wskaźnik celów zrównoważonego rozwoju (SDG) w krajach wschodzących. Ponadto wykorzystano regresję panelową (model statyczny) do zbadania zmiennych dotyczących przedsiębiorczości wpływających na wskaźnik celu zrównoważonego rozwoju (SDG) w krajach wschodzących. Ponadto do analizy stacjonarności zmiennych zastosowano testy Levina, Lin i Chu (LLC), W-Stat – IPS, ADF-Fisher Chi-Square i PP-Fisher Chi-Square. W celu zbadania występowania pęknięć konstrukcyjnych sprawdzono wytrzymałość na pojedynczych jednostkach przekroju poprzecznego oraz na całym zbiorze danych panelowych. Ponadto zastosowano test Hausmanna do wyboru między efektami losowymi i stałymi oraz przeprowadzono heteroskedastyczność reszt, autokorelację reszt i zależność reszt między panelami. Dane zostały przeanalizowane za pomocą Eviews 13.* ***WYNIKI:*** *W artykule zbadano związek między zrównoważonym rozwojem a przedsiębiorczością w krajach wschodzących. Omówiono wpływ zrównoważonego rozwoju na przedsiębiorczość oraz wpływ przedsiębiorczości na zrównoważony rozwój.* ***IMPLIKACJE:*** *Wyniki badań mogą być wykorzystane przez rządy i decydentów do planowania strategii i polityk dotyczących przedsiębiorczości i realizacji celów zrównoważonego rozwoju. Powinny one promować przedsiębiorczość i jednocześnie kontrolować negatywny wpływ przedsiębiorstw na środowisko.* ***ORYGINALNOŚĆ I WARTOŚĆ:*** *Badanie odpowiada na lukę w literaturze dotyczącej relacji między zrównoważonym rozwojem a zrównoważoną przedsiębiorczością. Artykuł analizuje wzajemny związek między zrównoważonym rozwojem a przedsiębiorczością, ze szczególnym uwzględnieniem krajów wschodzących.*

Słowa kluczowe: *przedsiębiorczość, zrównoważoność, zrównoważony rozwój, zrównoważona przedsiębiorczość, kraje wschodzące, przedsiębiorcy*

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Conflicts of interest

The authors declare no conflict of interest.

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Is Team Entrepreneurial Orientation important in generating creative business ideas? The moderating role of team-perceived heterogeneity and the individual creative mindset

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Abstract

PURPOSE: *The study aims to unveil if Team Entrepreneurial Orientation (TEO) facilitates identification of creative market opportunities understood as novelty and quality business ideas. Entrepreneurial Orientation (EO) has rarely been measured at a team level and few studies have attempted to examine the relationship between EO and actual creative outcomes. The proposed research model searches for new patterns that can foster creativity of entrepreneurial teams. In addition, the research adds the moderating effect of perceived team heterogeneity and individual creative mindset (Growth-Creative and Fixed-Creative Mindsets) as contingency variables to improve the understanding under which circumstances the entrepreneurial teams generate creative business ideas.* ***METHODOLOGY:*** *The research sample comprises entrepreneurial teams from the Mondragon Team Academy in the Basque Country, Spain. The survey data were collected after the entrepreneurial teams performed idea generation. The applied experiment of idea generation of entrepreneurial teams has not been generated for the purpose of the study but it formed part of the natural processes of the selected sample of teams. The novelty and quality of business ideas were evaluated by experts in the field. The data relationships were analyzed through partial least square structural equation modeling (PLS-SEM).*

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***FINDINGS**: Entrepreneurial Orientation of teams leads to product-market entries but not necessarily to novel product-market entries. Entrepreneurially oriented teams have a greater tendency to generate quality and slightly modified existing business ideas rather than to generate novel market opportunities. The applied moderators present different interaction results with the studied relationships. Specifically, individuals with a Fixed-Creative Mindset in a team have an antagonistic interaction on the TEO-Quality relationship. Team-Perceived Heterogeneity and Growth-Creative Mindset of individuals have no effect on either the TEO-Quality or the TEO-Novelty link. **IMPLICATIONS:** The research demonstrates the importance of contextualization of the nature of creativity in EO as a crucial antecedent of market innovations. Our study adds to the literature and practice by providing evidence that EO at a team level (TEO) plays a critical role in exploring product-market entries, given that TEO facilitates Quality outcomes only. Entrepreneurially oriented teams do not easily achieve Novel outcomes that allow them to enter new markets. Individuals with Fixed Creative Mindset in a team should be avoided as they block the relationship between Team Entrepreneurial Orientation and Quality. Likewise, our study supports the validity of Entrepreneurial Orientation at a team level, which can lead to more suitable practical implications for a team and its creativity management if applied. It could help in developing appropriate team formation and team management practices. **ORIGINALITY AND VALUE:** The study proposes rare and unique EO analysis at a team level and at young companies' level (start-up). The study contributes to the original and overlooked in the literature conceptualization of EO within Schumpeter's perspective of "creative destruction" in entrepreneurial activities. The examined theoretical foundations of EO led to clearer antecedents of behavioural effects of entrepreneurial teams towards product-market entries. The study initiates, identifies and calls for new further research lines to contribute to a greater and contingent understanding of how entrepreneurial teams generate creative business ideas, especially, novel business ideas, which are necessary for "creative destruction", the EO construct itself and overall economic development.*

***Keywords:** entrepreneurship, creativity, team, entrepreneurial orientation, creative outcomes.*

INTRODUCTION

During a time when product and business model life cycles are shortening, entrepreneurs' capacity to generate new market opportunities has become even more crucial from a scientific and practical perspective (Pérez-Luño, Wiklund, & Cabrera, 2011). New ideas for ventures, however, are rarely the product of a single entrepreneur working in isolation. Rather, they are devised by a team of entrepreneurs (Jin et al., 2017). For decades, teams have been more effective than individuals in generating more novel and higher-quality ideas (Barczak, Lassk, & Mulki, 2010; Kier & McMullen, 2020). Much of the experimental literature on team creativity has its antecedents

in the brainstorming paradigm performed with groups prepared ad hoc for the study in question, in limiting laboratory environments, focusing on the quantity rather than the quality of the ideas generated (Kurtzberg & Amabile, 2001; Yuan, 2019). The literature has largely been limited to empirical studies exploring the personality of 'creative' entrepreneurs (Palmer, Niemand, Stöckmann, Kraus, & Kailer, 2019) without considering actual creative performance and the collective generation of creative performance outcomes. Subsequently, we still lack sufficient understanding of how entrepreneurial teams actually form creative ideas for business development (Gundry, Ofstein, & Monllor, 2016; Yuan, 2019).

For the purpose of clarity, this study addresses the concept of creativity through the dimension of an outcome, a *product*, viewed as a creative idea generated by a team of entrepreneurs. We define a creative idea within the key creativity features: quality (useful, effective and implementable solution) and novelty (Amabile, 1997; Ylitalo, 2017). In entrepreneurship, novelty refers to the originality, newness, and distinctiveness of business opportunities compared with existing products or services in the market (Perry-Smith & Mannucci, 2017). Meanwhile, the usefulness (quality) of creativity guarantees that customer needs are better served and allows entrepreneurs to obtain potential economic benefits (Gruber, Kim, & Brinckmann, 2015). In general terms, creativity in entrepreneurship drives differentiation, and competitiveness (Zhou, Wang, Song, & Wu, 2017). Not surprisingly, therefore, scholars (Covin & Slevin, 1989; Lumpkin & Dess, 1996) have been trying to understand the tendency of entrepreneurs to create, discover and exploit new product–market entries. The studies have resulted in the evolution of the most common construct in entrepreneurship literature, known as Entrepreneurial Orientation (EO) that captures and reflects the strategic orientations of entrepreneurs (Lumpkin & Dess, 1996) towards the creation of new value on the market. Even though creativity seems to be the very explicit outcome of EO, it has not been fully explored yet and especially, in the currently common context of entrepreneurial teams. Without a doubt, EO and creativity dimensions can enhance each other, providing the base for our study that connects EO at a team level and creativity in a new explanatory and causal research framework.

In this regard, our study applies an Entrepreneurial Orientation (EO) construct, which in broad EO-performance relationship studies has rarely included creativity as its specific type of performance outcome and has rarely been conducted at a team or entrepreneurial team level (Kollmann et al., 2017). Our study, therefore, extends and advances the research domain with three key contributions.

Firstly, following the suggestions of Kollmann, Stöckmann, Meves, and Kensbock (2017), Covin et al. (2020) and Wales et al. (2020), it alters the context of analysis by conceptualizing EO at a team level (Team Entrepreneurial Orientation, TEO) and at emerging firms (start-up) level including the pre-organizational phases of entrepreneurship (prior to startup existence) (Lumpkin & Pidduck, 2021). For the team-level analysis, we extend the common aggregate models of the individual-level construct, which contributes to a better understanding of TEO (Covin et al., 2020; Fellnhofer, Puumalainen, & Sjögrén, 2017). The young firm's level analysis enhances the understanding of the processes and outcomes surrounding EO and entrepreneurial teams (Kollmann et al., 2017) at an early stage of entrepreneurial activity, without the corporate structures influence on team members' orientation.

Secondly, our study applies the contingency view (Linton, 2016) to better comprehend the conditions, situations, and context under which the TEO is actually reflected in creative outcome performance: novelty and quality of the generated business idea (Amabile, 2013). Our study adds two novel moderating effects: Team-Perceived Heterogeneity and individual creative mindset to expand an understanding of the link between TEO and creative outcomes. It enables us to detect whether and when TEO leads to potential new product-market entries that can "creatively destroy" (Schumpeter, 1934) the current economic paradigms, verifying the accuracy of the theoretical foundations of EO (Wales et al., 2020).

Thirdly, our study stresses the distinction between creativity and innovation. It views creativity as the first stage of innovation (Gundry et al., 2016). Detecting the TEO-creativity relationship and revealing the factors that affect the generation of creative ideas by entrepreneurial teams, can explain and anticipate the whole range of future performance outcomes, specifically, TEO-market entry innovation leading to clearer antecedents of behavioral effects of entrepreneurial teams towards further performance outcomes.

The paper is structured as follows. First, we discuss the theoretical arguments and empirical evidence regarding TEO, creativity and the link between them, building our hypotheses. Next, we present the method used to test these hypotheses. We then present and discuss our results. We conclude with an assessment of how the study's findings contribute to the literature on EO and creativity, their practical implications for entrepreneurs, and the possible direction of future analyses.

LITERATURE REVIEW AND HYPOTHESES

Team Entrepreneurial Orientation and Creativity

After almost five decades of research, Entrepreneurial Orientation (EO) has become one of the most widely studied areas in entrepreneurship literature (Wales et al., 2020). EO explains the tendency to discover and exploit new products–market opportunities "lead[ing] to new entry" (Lumpkin & Dess, 1996, p. 139). The original conceptualization of EO by Covin and Slevin (1989) defines EO as innovative, proactive, and risk-taking behaviors of entrepreneurial entities in the generation of new product-market entries. Lumpkin and Dess (1996) launched the idea that competitive aggressiveness and autonomy should also be EO dimensions. Many authors use the three original dimensions while others use different combinations of the five (Wales, Gupta, & Mousa, 2013). Independently from the dimensions applied, the essence of the definition of EO suggests that creativity is somewhat its integral part and that some aspects of EO are a catalyst to adapt creativity in the process of new entry development (Yi, Amenuvor, & Boateng, 2021).

The aspect of creativity in EO has been mentioned even before its commonly known origins in the early studies of Covin and Slevin (1989) and Lumpkin and Dess (1996). The most important theoretical foundations of EO are based on Schumpeter's (1934) perspective of economic development and especially innovation and entrepreneurship, which has often been overlooked in EO research. Relating to Schumpeter's early ideas, entrepreneurially oriented entities are defined based on their tendency to embrace new practices and go beyond the current state-of-the-art: such as new and creative ideas, novelty, and experimentation (Lumpkin & Dess, 1996). This concept was used by Schumpeter (1934) to stress the influence of creativity on the creation of new products, services or organizations that act as new entrants or agents of change that "creatively destroy" extant economic regimes and in doing so, generate possible new areas of growth (Wales et al., 2020) revolutionizing the economy (Corte & Gaudio, 2017).

Consequently, novelty and usefulness (also known as quality) emerged as the key concepts of creativity and were further used by its key proponents, Amabile (1997) and Sternberg (1999). In this regard, both elements of creativity are also fundamental in entrepreneurship, but they require to be effectively implemented. The business idea may be novel, but its acceptance by the market is dependent on its real usefulness. On the other hand, the idea may be useful, but if it is already applied, it will not generate new value on the market (Corte & Gaudio, 2017). Along similar lines, Schumpeter's oft-overlooked theory naturally links Entrepreneurial Orientation and creativity

in trying to explain that an EO entity's role is to elevate new entries to the level of market disruptors. It is also reflected in the most recent exhaustive bibliometric meta-analysis by Wales et al. (2020), which argues that the Schumpeterian perspective of the role of "creative destruction" within EO should be the center of any future development of EO research. Following scientific calls, Schumpeter's theory has become the basis of our new research framework.

Previous studies have already explored a number of EO performance frameworks, with most focusing on financial performance (Hughes, Chang, Hodgkinson, Hughes, & Chang, 2021) or new venture performance (e.g., sales volume, sales growth, market share) (Donbesuur, Boso, & Hultman, 2020; Lumpkin & Dess, 1996). The relationship with the intermediate steps, such as EO-creative performance outcomes, is not very clear in scientific literature. We can detect, however, some indirect insights in scientific papers on EO-innovation (Rauch, Wiklund, Lumpkin, & Frese, 2009), where scholars have consistently established (across different national cultures, firm sizes or industries) that greater product/market entry innovation is associated with greater EO and its separate dimensions such as proactiveness and greater risk-taking. Similarly, Pérez-Luño et al. (2011) stated that the launch of "new to the world" product appears to be a result of EO. Zhai et al. (2018) and Wang, Dass, Arnett, and Yu (2020) found that EO affects engagement in activities that enable new value creation and innovation performance. Additionally, Donbesuur et al. (2020) proved the positive influence of EO on the discovery of market opportunities and its enhancing effect on firm performance.

None of these scholars have sufficiently considered whether EO is closely associated with "entry" into new or established markets, either with new or existing goods or services. All too often, scholars associated the launch of new products with the generation of novel ideas when, indeed, they might often be the effect of adopting and modifying what others have already developed (Pérez-Luño et al., 2011). Scholars limited their conclusions to the quantity of the innovations (Pérez-Luño et al., 2011) or indirect outcome assessments, such as level of expenditure on R&D research for new value creation (Wang et al., 2020), the opinion of top management towards opportunity discovery activates (Donbesuur et al., 2020), and scale of success relative to major competitors in terms of introducing new products (Zhai et al., 2018). The common corporate level, somehow limited the evaluation of EO and the creativity–innovation link to the opinion of managers, heads of departments, executives, directors, and not the exact "creators" of the outcomes.

The so far seen EO, as a firm or business unit construct, has taken homogeneous and similar approaches neglecting other perspectives of analysis and hampering the future of EO development in the literature

(Linton, 2016). Not many researchers have critically examined the EO-performance relationship. It is common to see in EO studies that many researchers adopt a universalistic view assuming the notion that there is a universal law that higher EO will always result in higher performance (Linton, 2016). There is a need for more of a contingency view, perceiving EO as beneficial in certain situations or contexts, and explaining in more detail under which circumstances the EO-performance can be straightforward or not (Linton, 2016).

According to Lumpkin and Pidduck (2021), if EO is to continue reflecting what it means to be entrepreneurial, it is clear that the concept needs to evolve to accommodate the diverse manifestations and venues for entrepreneurship that are now evident to a global community of researchers. Kollmann et al. (2017) proposed to expand the level of analysis from the firm-level context to downstream levels including the individual, team, entrepreneurial team and emerging young firm, where the organizational structure or hierarchical administrative systems do not mask the effects of the team members' orientation on collective performance. Like Lumpkin and Pidduck (2021), we consider that EO should be part of the conversation towards firm birth, nascent entrepreneurship, and the topic of what happens prior to and during firm formation, which is why the study focuses on early entrepreneurship activities of a team prior to the start-up formation, such as generation of novel and quality business ideas. Capturing EO at a team level (Kollmann et al., 2017) and at the early stage of entrepreneurial activity (emerging start-up) (Lumpkin & Pidduck, 2021) can explain the path and behavioral effects of entrepreneurially oriented teams towards launching new entries completing the more contingency view.

Despite several calls to understand better the way in which individuals, individually and collectively, contribute to entrepreneurship through entrepreneurial behaviors grounded in EO, little empirical research is dedicated to the teams in which they work. Within teams, individuals can choose to deploy entrepreneurial behaviors grounded in EO (Covin et al., 2020). The commonly known aggregation of individual EO (termed IEO) (Covin et al., 2020) to calculate EO at the team level (TEO) does not sufficiently capture whether the entrepreneurial behaviors are really manifested by individuals to improve team performance. Hence, in our study, we understand TEO as the perception of individuals towards the collective manifestation of entrepreneurial behaviors of EO within the team. The key behaviors of TEO include an ability of a team to act autonomously, a willingness to innovate and take risks, and a tendency to be proactive with regard to new market opportunities.

The EO construct in the team-level context has not been contrasted yet with numerous performance outcomes and it is a quite unexplored area of study. EO has been contrasted with entrepreneurial team performance (Kollmann et al., 2017) or TEO with work group performance (Fellnhofer et al., 2017). In both cases, the relationship has been positive but again only within a corporate context (with reference to top/senior management teams). The effect of the construct on team innovative performance has been recently addressed by Shahid et al. (2022). The authors, however, applied EO at an individual level and as a mediator between team identification and team innovative behavior, understood as creativity (idea exploration and creation) and innovation (idea championing and implementation). In both cases, the mediating effect of EO has been proven positive. The team context in EO studies has occasionally been addressed in the scientific literature. Yet, from the overall team performance perspective, teamwork quality is an important success factor of innovative projects (Hoegl & Gemuenden, 2001) and teams for years have been considered more effective in generating more creative outcomes than single individuals (Barczak et al., 2010; Kier & McMullen, 2020). The empirical evidence, although, regarding the influence of teamwork, and within the EO domain, on the success of teams with creative and innovative tasks is still scarce.

Given the state of the literature, we posit the following hypotheses:

H_1. Team Entrepreneurial Orientation (TEO) is positively related to the novelty of a business idea

H_2. Team Entrepreneurial Orientation (TEO) is positively related to the quality of a business idea

Team-Perceived Heterogeneity: Moderator TEO-Creativity

Prior EO research has already analyzed the possible impact of heterogeneity within work groups (Fellnhofer et al., 2017). In general terms, deep-level heterogeneity can have beneficial effects whenever it functions as an informational resource (Knippenberg, Ginkel, & Homan, 2013). Teams that are heterogeneous in perspectives, knowledge, experiences or information may build upon more complex informational resources, which encourage higher-quality decisions, more advanced solutions to work problems, and greater creativity (To, Fisher, Ashkanasy, & Zhou, 2021), and finally leading to improved team performance (Knippenberg et al., 2013). In this context, Heavey, Simsek, Roche, and Kelly (2009) concluded that working group heterogeneity allows the group to accumulate comprehensive information

with reference to exploring and exploiting entrepreneurial opportunities. Kollmann et al. (2017) have stressed that individuals' heterogeneity leverages the EO of a group, in turn improving collective performance. Fellnhofer et al. (2017), rather than taking the common aggregation of individuals' heterogeneity, instead measured the individual's perception of group heterogeneity and its significant relationship with TEO. Previous studies mainly focused on the heterogeneity effect (individual or group) on variations in TEO and further performance. Our study, therefore, seeks to observe Team-Perceived Heterogeneity as a moderator between TEO and creative outcomes of entrepreneurial teams, in order to detect whether it strengthens or weakens the relationship. Team heterogeneity in the form of demographic heterogeneity has been used as a moderator in previous studies (Ferrier & Lyon, 2004) observing the relationship between team behavior and team performance. However, it has not been tested in TEO-creativity relationships, either in the form of (perceived) deep-level heterogeneity or at entrepreneurial team level. Our study, therefore, posits the following hypotheses:

H_3. Team-Perceived Heterogeneity strengthens the relationship between TEO-Novelty of a business idea

H_4. Team-Perceived Heterogeneity strengthens the relationship between TEO-Quality of a business idea

Individual creative mindset: Moderator TEO-Creativity

The logic of applying individual inputs in our team-based research model lies in previously assumed theories (Baer, Oldham, Jacobsohn, & Hollingshead, 2008) that team creativity is based on individuals' creative ideas and their team's capacity to perceive and utilize such ideas. However, the empirical evidence for this disjunctive model of team creativity is rather scarce. It is more common to perform the additive model conceptualizing team creativity as being conditioned by the sum or average of the creativity of the individual members (Yuan, 2019). Integrating individual inputs into team creativity by additive models is an oversimplification (Yuan, 2019). We, therefore, propose to observe individual inputs as a moderator of the relationship between team and creative outcomes. This approach is more accurate in determining how individual inputs contribute to the team processes.

In order to choose the individual input-based moderator, we followed the theories of O'Connor, Nemeth, and Akutsu (2013) that revealed the important role of Fixed-Creative and Growth-Creative Mindsets of individuals in motivating or demotivating the performance of creative actions. When

individuals recognize creativity as a fixed trait, they have problems such as rationalizations about why they should engage in activities demanding creative thinking. On the other hand, individuals with a growth mindset, who think that creativity is determined by effort rather than by some innate quality, tend to see themselves as more creative, increasing the probability of individual commitment to creative tasks and, finally, creative solutions (Karwowski, 2014). Our study enhances previous theoretical assumptions by linking them to the entrepreneurship domain and observing whether the creative mindset of an individual (fixed versus growth) moderates the relationship between the TEO and creativity outcome of a team. Based on the previous assumptions, we argue that a growth mindset will enhance the TEO-Novelty and TEO-Quality relationship while a fixed mindset might weaken the relationship.

We posit the following hypotheses:

H_5. Growth-Creative Mindset strengthens the relationship between TEO and novelty of a business idea
H_6. Growth-Creative Mindset strengthens the relationship between TEO and quality of a business idea
H_7. Fixed-Creative Mindset weakens the relationship between TEO and novelty of a business idea
H_8. Fixed-Creative Mindset weakens the relationship between TEO and quality of a business idea

Ultimately, the defined hypotheses and the proposed directions of the effects are summarized in Figure 1, which presents the research framework.

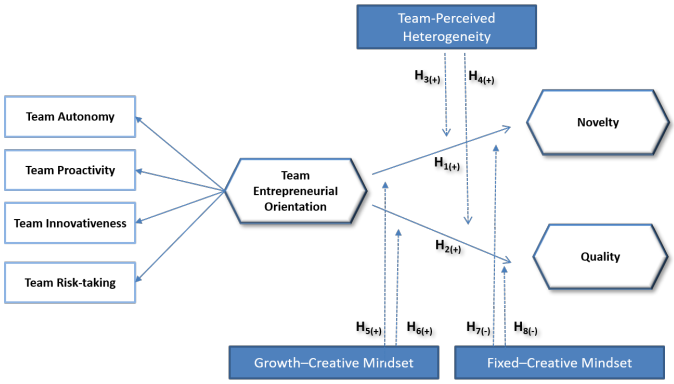


Figure 1. The conceptual Model and Hypotheses

METHOD

Sample and experiment procedure

The participants of the study belong to the entrepreneurship ecosystem of Mondragon Team Academy (MTA), which forms part of Mondragon University in the Basque Country, Spain. The sample is taken from all three co-working labs in the Basque Country: Irun, Oñati, and Bilbao. The total population size consists of 120 entrepreneurs (57 women and 63 men). The study applied probability sampling, meaning that every member of the population had a chance of being selected. To have the entrepreneurial teams properly represented in the sample it was necessary to have at least a 50% response rate per team (e.g., 2 responses from a 4-member team or 1 response from a 2-member team) and the average total number of team members per team could not be less than 2 members. It resulted in 78 entrepreneurs out of 120 entrepreneurs in total. The team entrepreneurs (38 women, 40 men) worked in entrepreneurial teams (13 in Oñati, 13 in Bilbao and 10 in Irun) made up of minimum 2 members, which gives 36 teams out of 50 in total. The details of the sample are shown in Table 1.

Table 1. Sample characteristics

	Sample	Population	%
n. Entrepreneurs	78	120	65
n. Female	38	57	67
n. Male	40	63	63
Age (20-25)	76	118	64
Age (> 25)	1	1	100
Age (<20)	1	1	100.0
n. Teams	36	50	72
n. Team Bilbao	13	16	81
n. Team Oñati	13	17	76.5
n. Team Irun	10	17	59
Avg. Year/Exp.	3.4	3.5	------
Avg. Member/Team	2.16	2.4	------

Note: n: number; n. Team Bilbao: number of teams in Bilbao Lab; n. Team Oñati: number of teams in Oñati Lab; n. Team Irun: number of teams in Irun Lab; Avg. Year/Exp: Average year of work experience as an entrepreneurial team; Avg. Member/Team: Average number of members per team.

The sample of team entrepreneurs participated in the experiment within the methodology of MTA. It was necessary to ensure the observation

of entrepreneurial creativity of teams in its natural environment rather than in a forced scientific exercise. Each team had a 3 months' period (within November 2019 and January 2020) to explore business opportunities and present its final business idea in a brief pitch at the end of the process. The teams were organizing the rhythm of work independently and based on request they had support from experts within the MTA ecosystem. There were four primary criteria taken into consideration:

Criteria 1: MTA promotes collective rather than individual entrepreneurship in co-working labs within the Basque Country, providing an accurate context of team entrepreneurship for the study.
Criteria 2: The MTA sample allows us to observe teams of entrepreneurs with real experience (equal or greater than 3 years) of working together in the proactive search/development of business opportunities. At this stage, teams are considered to have the attributes of a team (not a group) as they have more awareness regarding team members, their strengths and weaknesses (Kurtzberg & Amabile, 2001). The study experiment would not reach its objective if we observed a group of entrepreneurs generated only for the purpose of the study.
Criteria 3: The culture of MTA is based on a constant generation of business ideas as part of the educational model— the participants performed a design thinking exercise that allowed us to observe them in a natural process of business idea generation. The timeframe of the study experiment was chosen to coincide with the MTA exercise.
Criteria 4: The selected teams did not generate business ideas within a specific company. They had no organizational influence (cultural, structural, strategic influence) that allowed us to observe the "pure" process of entrepreneurial creativity of teams.

Data collection

We took two steps to collect data. First, all 120 entrepreneurs were invited to fill out a survey at the end of the experiment (after presentation of their final business idea). Participation was voluntary, and their responses were strictly confidential. They independently rated the scales of *Team Entrepreneurial Orientation* (14-item scale); *Individual Creative Mindset* (Fixed and Growth) (10-item scale); and *Perceived Team Heterogeneity* (4-item scale). The participants were evaluating all items from 1 (strongly disagree) to 5 (strongly agree). We received 78 responses that were useful for the study.

Second, we used a panel of expert judges to rate *Creativity*: Novelty and Quality of the team outcome—business ideas of 36 entrepreneurial teams—

meaning 36 business ideas (each team presented one final business idea). The selected panel of experts was appropriate to evaluate business ideas of entrepreneurial teams. The business ideas were context specific, which, according to the creativity literature, need to be evaluated by experts who are familiar with the specific domain (Amabile, 1997, 2013). The expert judges were very familiar with the business idea and the domain. They collaborated with the teams based upon their request. They had the expertise and knowledge appropriate for evaluation. In this vein, the experts who worked most frequently with the participating entrepreneurial team assessed the final business idea. It means that each expert judge was assigned a specific business idea to evaluate in order to omit the risk that the judge evaluates ideas that he/she has not enough knowledge about. On average the same expert judge evaluated approx. two business ideas.

Measures

The measures applied in this study are quantitative and are adapted from previously validated scales. Full scales are presented in the Appendix.

Team Entrepreneurial Orientation

The TEO construct is measured through a slightly modified 14-item scale partially proposed by Hughes et al. (2007) and fully adapted by Fellnhofer et al. (2017). The scale is originally based on Lumpkin and Dess (1996) and Covin and Slevin, (1989). The TEO measures, such as proactivity, risk-taking, and innovativeness, have been applied from (Hughes, Hughes, & Morgan, 2007) and adapted by Fellnhofer et al. (2017) to work-group contexts. The autonomy measure has been applied from Lumpkin and Dess (1996), and adapted by Fellnhofer et al. (2017) to work-group contexts. All measures applied the 5-point Likert scale. The work views TEO as a second-order composite, all the sub-dimensions make up the TEO artefact emphasizing the common effect of the EO dimensions. The measurement method applies the individuals' perception approach towards their team (e.g., *"My team excels at identifying opportunities"*). This approach to measurement omits the aggregate models of individual EO (IEO) to calculate team EO (TEO). Previous measurements by Fellnhofer et al. (2017) have shown that the individuals' perceptions are reflected in the team EO.

Creativity

The creative outcomes or creative ideas are measured using a scale mentioned by Dean, Hender, Rodgers, and Santanen (2006) and later suggested by Ylitalo (2017). The scale measures creativity using two dimensions: Novelty and Quality. Novelty includes originality and paradigm relatedness (the degree to which the idea is, for example, rare or surprising and whether it preserves or modifies the current paradigm). Quality includes workability (the degree to which the idea is easily implemented), relevance (the degree to which the idea solves a problem), and specificity (the completeness and clarity of the idea).

Individual Creative Mindset

The construct is measured on a 10-item scale proposed and validated by Karwowski (2014). It analyzes the participant's perception of the nature of creativity (Growth-Creative Mindset e.g. "*Everyone can create something great at some point if he or she is given appropriate conditions"* or Fixed-Creative Mindset e.g. "*Some people are creative, others are not—and no practice can change it*") on a 5-point Likert scale.

Team-Perceived Heterogeneity

The construct is measured on a 4-item scale adapted from Campion, Medsker and Higgs (1993) and used by Fellnhofer et al. (2017). The measurement method applies the perception approach of individuals towards their team (e.g., *"The members of my team vary widely in their areas of expertise"*). Previous measurements by Fellnhofer et al. (2017) have shown that individuals' perceptions are reflected in the Team-Perceived Heterogeneity

Data analysis method

We tested our hypotheses using partial least square (PLS), a structural equation modeling (SEM) technique that uses a principal components-based estimation approach (Chin, 1998). Firstly, PLS was used because our model used high-order composites. Both theoretical arguments (Rigdon, Sarstedt, & Ringle, 2017) and empirical evidence (Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016) support the use of PLS in models based on composite variables. Team EO (TEO) and Quality were modeled as a composite in mode A at the dimension and second-order construct level. By contrast, Novelty was a simple composite modeled in mode A.

Secondly, PLS-SEM techniques are applied because component scores are used in a subsequent analysis for modeling a multidimensional construct

using a two-stage approach (Chin, 2010; Wright, Campbell, Thatcher, & Roberts, 2012). As a result, PLS allows us to fulfill the explanatory purposes of the research, facilitating understanding of the causal relationships between variables. The statistical analysis software used was SmartPLS 3.2.7 (Ringle, Wende, & Becker, 2015).

RESULTS

We assessed the PLS model in three stages: (1) the measurement model, (2) the structural model, and (3) the moderation analysis.

Measurement model

We performed a confirmatory composite analysis of the saturated model using an overall model fit test (Henseler, Hubona, & Ray, 2016), allowing us to assess the external validity of the composites (Henseler, 2017). The two measures of discrepancy between the empirical and the model-implied correlation matrix are less than or equal to their corresponding HI95, while dG is lower than the HI99 value for the saturated models (see Table 2); hence, the discrepancy is not significant and we can safely assume the indicators form the composites, in accordance with the measurement model proposed (Henseler, 2017).

Table 2. Test of the model fit

Saturated model			
	Value	**HI95**	**HI99**
SRMR	0.076	0.087	0.102
dULS	0.263	0.337	0.467
dG	0.127	0.102	0.130

Note: SRMR: standardized root means square residual; dULS: the unweighted least squares discrepancy; dG: the geodesic discrepancy; HI95: bootstrap-based 95th percentile; HI99: bootstrap-based 99th percentile. Bootstrapping based on 10,000 subsamples.

The measurement model evaluation brought out acceptable results. All dimensions and indicators met the requirement of reliability, given that their outer loadings were greater than 0.707 (Table 3). Some of the outer loadings were moderately below this critical value. However, they were maintained to support the content validity. Besides, two items were removed from the T-autonomy construct due to their low outer loadings for the purpose to achieve convergent validity and other two from T-innovativeness in order to improve the discriminant validity between composites.

Table 3. Measurement model results

Composites/Dimension/Indicator	Loadings	CR	AVE
Team EO (High order Composite Mode A)		**0.823**	**0.540**
Team Autonomy (Composite mode A)	**0.718**	**0.780**	**0.546**
T-autonomy_1	0.812		
T-autonomy_4	0.793		
T-autonomy_5	0.591		
Team Innovativeness	**0.637**	**1.000**	**1.000**
Team Innovativeness-1	1.000		
Team Proactivity	**0.784**	**0.779**	**0.544**
Team-Proactivity1	0.598		
Team-Proactivity2	0.817		
Team-Proactivity3	0.779		
Team Risk-taking	**0.790**	**0.810**	**0.588**
Team-Risk-taking1	0.786		
Team-Risk-taking2	0.758		
Team-Risk-taking3	0.756		
Quality (High Order Composite Mode A)		**0.849**	**0.656**
Relevance	**0.828**	**0.912**	**0.838**
Relevance_1	0.904		
Relevance_2	0.927		
Workability	**0.676**	**0.767**	**0.641**
Workability1	0.544		
Workability2	0.992		
Specificity	**0.908**	**0.866**	**0.684**
Specificity1	0.831		
Specificity2	0.718		
Specificity3	0.921		
Novelty- Composite Mode A		**0.915**	**0.843**
Novelty 1	0.928		
Novelty 2	0.908		

Note: CR: Composite Reliability; AVE: Average Variance Extracted.

All second-order reflective (superordinate) composites (TEO and Quality) and the first-order composite (Novelty) had outer loading values above 0.7 and thus fulfilled the required construct reliability. To assess convergent validity, we examined the average variance extracted (AVE) (Hair et al., 2011). AVE should be greater than 0.5, which means that 50% or more of the variance of

the indicators should be accounted for. Consistent with this suggestion, AVE measures for all constructs are above 0.540 (Table 3). Table 4 shows that all variables had discriminant validity, according to the HTMT criterion (Henseler, Ringle, & Sarstedt, 2015), thereby giving evidence that TEO, Quality, Novelty are distinctive composites.

Table 4. Measurement model discriminant validity

	TEO	Quality	Novelty
TEO	*0.735*	**0.625**	**0.120**
Quality	0.484	*0.810*	**0.331**
Novelty	0.009	0.220	*0.918*

Note: TEO: Team Entrepreneurial Orientation; The HTMT appears above the diagonal in bold. The correlations appear below the diagonal. On the diagonal itself, the AVE squared appear in italics.

Structural model

We turn next to data generated by the structural model with which we can test our hypotheses. We evaluated the model by examining the algebraic sign, magnitude, and significance of the structural path coefficients and the R^2 values. Figure 2 and Table 5 show the path coefficients and the amounts of variance explained (R^2) in the endogenous variables. The R^2 values show that the explanatory power of the model is weak to moderate (Chin, 2010), explaining 0% of the variance in Novelty and 23.5% of the variance in Quality.

To evaluate the significance of the direct effects in the path model, a bootstrapping process (10,000 samples) was performed, providing p-values and confidence intervals (Roldán & Sánchez-Franco, 2012). As Table 5 shows, the results support Hypothesis 2, positing a direct, positive relationship between TEO and Quality, (β=0.484, t=5.568) and the associated f^2= 0.307 is close to the value standard of 0.350 for substantial effect (Chin, 2010). The relationship between TEO and Novelty is not supported (Hypothesis 1 (β=0.009, t=0.055). To evaluate the model, the blindfolding was adapted using the cross-validated redundancy index (Q^2) for the endogenous variables. This measure was suggested by Chin (2010) for examining the predictive relevance of structural models. Q^2 values greater than zero imply that the model has predictive relevance. The results support that the structural model has a satisfactory predictive relevance only for the endogenous composite – Quality (Q^2=0.133).

Next, to test moderation hypotheses, this work tests the interaction effect of T.P. Heterogeneity, Growth-Creative Mindset and Fixed-Creative Mindset in the path between TEO and Novelty, and TEO and Quality, using an orthogonalizing approach (Fassott, Henseler, & Coelho, 2016). As in regression

analysis, the predictor TEO and the moderator variables are multiplied to obtain the interaction term. In the relationship between TEO-Novelty and TEO-Quality, when the moderator effect Team-Perceived Heterogeneity is considered, the analysis results show no evidence related to this effect (see Table 5).

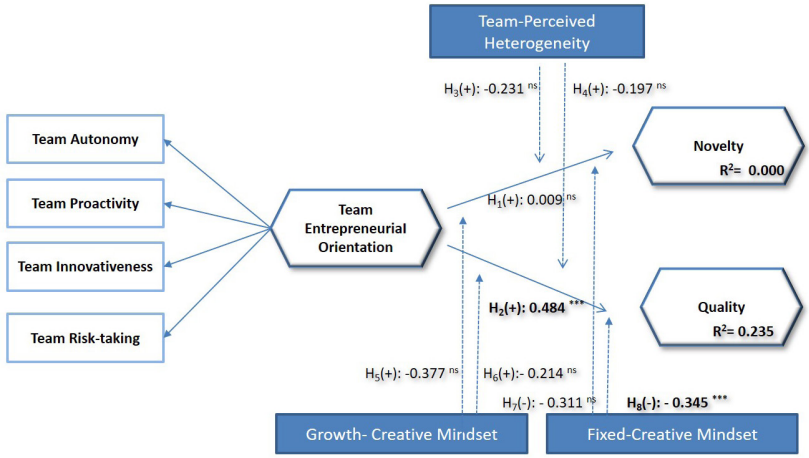
Table 5. Effects on the endogenous variables

	Path Coef.	P -value	CI	Support	f^2
H_1(+):TEO → Novelty	0.009	0.478	[-0.231; 0.254]	No	0.000
H_3(+): TEO x T.P. Heterogeneity → Novelty	-0.231	0.266	[-0.467; 0.489]	No	0.069
H_5(+): TEO x Growth-Creative M. → Novelty	-0.377	0.182	[-0.556; 0.554]	No	0.133
H_7(-): TEO x Fixed-Creative M. → Novelty	-0.311	0.233	[-0.540; 0.529]	No	0.095
H_2 (+): TEO→ Quality	0.484***	0.000	[0.367; 0.648]	Yes	0.307
H_4(+): TEO x T.P. Heterogeneity→ Quality	-0.197	0.232	[-0.450; 0.428]	No	0.059
H_6(+): TEO x Growth-Creative M.→Quality	-0.214	0.261	[-0.445; 0.443]	No	0.044
H_8(-): TEO x Fixed-Creative M.→ Quality	-0.345***	0.000	[-0.536; -0.293]	Yes	0.165

Note: Path Coef.: Path Coefficient; CI: Percentile confidence interval.; TEO: Team Entrepreneurial Orientation; T.P. Heterogeneity: Team-Perceived Heterogeneity; Growth-Creative M.: Growth-Creative Mindset; Fixed-Creative M.: Fixed-Creative Mindset; Bootstrapping based on n=10,000 subsamples. Hypothesized effects are assessed by applying a one-tailed test for a t Student distribution (CI 95%). *** significance at p< 0.001; ($R^2_{Quality}$=0.235; $Q^2_{Quality}$=0.133) ($R^2_{Novelty}$ 0=.000; $Q^2_{Novelty}$=-0.001).

For these reasons, H_3 (β =- 0.231 p=0.266) and H_4 (β =-0.197 p=0.232) related to moderation effect of T.P. Heterogeneity on TEO- Novelty and TEO-Quality link have been rejected. Similarly, Growth-Creative Mindset does not increase the effect of TEO on Novelty and Quality of business ideas, failing to support either H_5 (β =-0.377 p=0.182) or H_6 (β =-0.214 p=0.261). Therefore, Growth-Creative Mindset does not moderate either the TEO-Novelty or the TEO-Quality link.

In Table 5, the results support H_8 (β =-0.345 p=0.000) presenting that Fixed-Creative Mindset negatively moderates the link between TEO and Quality. Along these lines, the interaction term also shows a moderate f^2 value that is above the threshold of 0.150, meaning that it can be considered as a moderate moderation (Chin et al., 2003). Therefore, the moderating effect predicts the weakening of the TEO-Quality path in a Fixed-Creative Mindset context.



*** significant at p-value <0.001 (one tailed); ns: non-significant

Figure 2. Standardized path coefficients and significance of inner model

The findings from the results of the path analysis are discussed in the following section.

DISCUSSION

The findings of the study enhance our understanding of the theory that EO plays a critical role in exploring market opportunities leading to potential new entries on the market (Donbesuur et al., 2020; Lumpkin & Dess, 1996; Pérez-Luño et al., 2011; Wang et al., 2020; Zhai et al., 2018). Our study, however, contributes to common assumptions by applying the team-level analysis (Covin et al., 2020; Wales et al., 2020) of the EO construct (TEO) and by dividing the measure of market opportunities into the dimensions of Novelty and Quality. Consequently, our study has discovered a positive relationship between TEO and Quality, meaning that entrepreneurially oriented teams are capable of exploring workable (i.e., implementable), relevant (i.e., applicable and effective in solving problems), complete and explicit business ideas. Interestingly, our study expected a positive result between TEO and Novelty (Hypothesis 1), but the findings of the study have shown no relationship between TEO and Novelty, meaning that EO at a team level does not affect the team's ability to generate novel market opportunities. It might be the effect of the process of adoption and/or modification of already existing business ideas by entrepreneurial teams rather than novel generation (Pérez-

Luño et al., 2011). This indicates that TEO in Basque entrepreneurial teams does not so easily lead to new entries on the market. They might more often achieve the entry of an adopted idea than a novel idea that breaks existing market paradigms. It might have an important practical implication from the perspective of MTA in better understanding of entrepreneurial teams and in seeking educational or team-management strategies to improve teams' ability to generate new market value and novel market offers.

The contribution of such results to the literature is that the Entrepreneurial Orientation of a team generates market entries but not necessarily *new* market entries, as primarily assumed by Lumpkin and Dess (1996) and Covin and Slevin (1989). EO at entrepreneurial teams' level seems to provide less straightforward and universalistic results than previously assumed within the context of EO at a corporate level (e.g., (Pérez-Luño et al., 2011; Rauch et al., 2009; Wang et al., 2020)). It also justifies the calls of Kollmann et al. (2017) and Lumpkin and Pidduck (2021) to introduce EO within the context of a team and prior to start-up launch context. Our results strengthen the opinion of the authors that the construct can have its effect on what happens prior to and during firm formation.

In related terms, individual inputs might change the conditions under which entrepreneurial teams can generate the necessary completion of novel market opportunities that are also workable or relevant (Corte & Gaudio, 2017). Following the theory of Baer et al. (2008) and Yuan (2019), individuals help in the generation of creative ideas and the team has the necessary capabilities to recognize and utilize them. Our study, therefore, applied the moderating effect of an individual creative mindset to test empirically whether individual inputs strengthen or weaken the relationship between TEO-Novelty and TEO-Quality links.

Remarkably and contrary to our expectations (Hypothesis 5), the results indicate that Growth-Creative Mindset has no effect on the TEO-Novelty and TEO-Quality relationships. This means that Growth-Creative Mindset does not interfere (either by strengthening or by weakening) the relationship. It suggests that entrepreneurially oriented teams of MTA that include individuals with a Growth-Creative Mindset will not necessarily generate more novel and/or quality business ideas. The findings are not consistent with common theories that creative individuals are the main source of the creative outcomes of a team (Baer et al., 2008; Yuan, 2019). The data might indicate that the ability of individuals with a Growth-Creative Mindset to engage in creative tasks and generate creative solutions (O'Connor et al., 2013) is not correctly expressed at a team level or requires certain additional factors to be recognized in a team. At an individual level, Growth-Creative Mindset has proven useful in reaching creative achievements (Karwowski, 2014). This further suggests that

there must be particular team-level factors that affect the individual capacity previously studied, an area that merits further analysis.

By contrast, the data shows that fixed mindset among individuals (Fixed-Creative Mindset) has an antagonistic interaction on the TEO-Quality relationship and no interaction effect on TEO-Novelty, meaning that Fixed-Creative Mindset weakens the positive TEO-Quality relationship when the moderator increases. This suggests that individuals with fixed mindsets might be a blockage in team processes for quality of business ideas (see Figure 3). It supports the explanation posited by Karwowski (2014) and O'Connor et al. (2013) that individuals with fixed mindsets encounter problems in engaging in activities requiring creative thinking. It might be assumed, therefore, that entrepreneurial teams should possibly minimize the number of individuals with a fixed mindset among their members in order to prevent difficulties. It elaborates on contingency theory (Linton, 2016) showing that EO at a team level does not universally benefit in high performance of a team. The fixed mindset of individuals can be a possible obstacle to manifest the entrepreneurial behaviors of team members resulting in worse team performance.

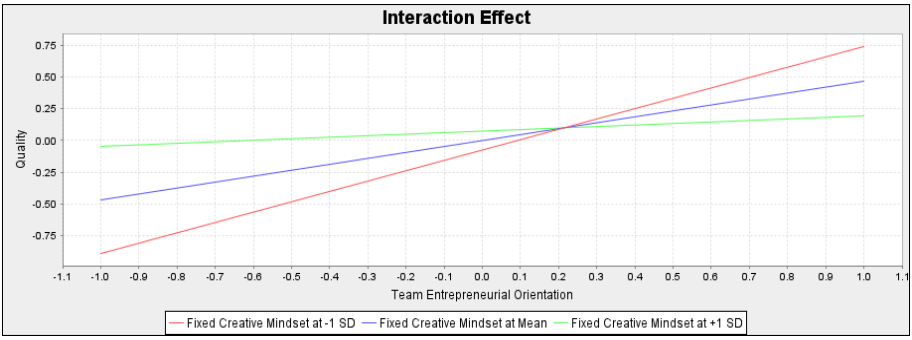


Figure 3. Fixed-Creative Mindset interaction effect on TEO and Quality

The findings have provided no evidence that Team-Perceived Heterogeneity (T.P. Heterogeneity) moderates the relationship between TEO and Novelty or Quality. There is no evidence that Team-Perceived Heterogeneity interferes (either by strengthening or weakening) the tendency of an entrepreneurially oriented team to generate creative outcomes. Previous studies concluded that group heterogeneity makes it possible to accumulate comprehensive information, helping to generate greater creativity (To et al., 2021) and exploring and exploiting entrepreneurial opportunities (Heavey et al., 2009). This effect might perhaps be seen in more diverse groups/teams. The sample of entrepreneurs was from a similar age group and from similar backgrounds. This might result in insufficient diversity of information,

resulting in a lack of significant interaction. Further studies might test Team-Perceived Heterogeneity in more diverse teams or in a form of antecedent of TEO, as suggested by Fellnhofer et al. (2017).

Our study supports the validity of TEO measurement based on the perception of team members (Fellnhofer et al., 2017), which might lead to more suitable practical implications for team/creativity management if applied. Such an approach removes the risk of predicting that the sum of entrepreneurially oriented individuals guarantees that a team will have a high level of Entrepreneurial Orientation. An individual's perception of TEO reflects more accurately the EO of a team, as well as how an individuals' entrepreneurial behavior is expressed and manifested in a team. It could help in developing appropriate team formation and management practices.

CONCLUSION

Our study adds to the literature and practice by providing evidence to the still unanswered question of how entrepreneurial teams form creative business ideas for further business development. EO at a team level (TEO) plays a critical role in exploring product-market entries, given that TEO facilitates Quality outcomes only. Entrepreneurial teams do not easily achieve Novel outcomes that allow them to enter new markets. Individuals with Fixed-Creative Mindsets might weaken the team processes towards quality business idea.

Naturally, our analysis is subject to several well-recognized limitations, which ultimately inform possible avenues for further research that might advance the literature. One consideration is our cross-sectional study and lack of observations of the implementation of the business ideas generated. Further research could perform a longitudinal study and, additionally, detect the effect of creative outcomes on TEO innovation and further TEO new venture performance. The results may also be viewed as lacking generality, since the study applied a sample of entrepreneurial teams from Basque MTA labs. Forthcoming studies could extend the sample to new entrepreneurial teams, nationally or internationally wise, but maintaining similar criteria of the experiment procedure. This could help detect whether the findings indicate an overall pattern or, primarily, apply only to the entrepreneurial teams analyzed within the Basque MTA settings.

Further studies might contribute to a greater understanding of creativity as an explicit outcome of a EO construct. Scholars need to detect factors and circumstances that influence (positively or negatively) a team's tendency to generate novel product/market entries to complement the

unveiled entrepreneurial team's already strong ability to generate quality opportunities. New predictors, moderators and mediators could be measured to observe whether team and individual inputs are released under new (team) conditions, resulting in more novel outcomes. Future research could model TEO in separate dimensions (Wales et al., 2020) to measure in greater detail the relationship between each one and a creative outcome.

Scholars should continue to go beyond the corporate context of the construct to observe and better understand the outcomes between EO and entrepreneurial teams without strong organizational influence. Following our study results, and the recent suggestions of Lumpkin and Pidduck (2021), researchers should pursue to include EO more frequently within the topics related to nascent entrepreneurship. It is necessary to profound our understanding on behavioral effect of Entrepreneurial Orientation on early entrepreneurship process and activities including the discovery, exploitation and creation of market opportunities prior to firm birth. Such new contexts of studies might explain the path of entrepreneurially oriented teams towards the launch of new entries. What is more, scholars should constantly adapt the EO construct to the real changes in entrepreneurship practice. Hence, promoting analyses within the entrepreneurial teams could benefit the scientific and practical implications.

Appendix: Measurement Items

A. **Team Entrepreneurial Orientation**

	Team Entrepreneurial Orientation (adapted from Fellnhofer et al., 2017)
Team Proactivity 1	My team initiates actions to which other respond.
Team Proactivity 2	My team excels at identifying opportunities.
Team Proactivity 3	My team always tries to take the initiative in every situation (e.g., against competitors, in projects and when working with others).
Team Risk Taking 1	People in our team are encouraged to take calculated risks with new ideas.
Team Risk Taking 2	Our team emphasizes both exploration and experimentation for opportunities and takes bold, wide-ranging actions to achieve the objectives.
Team Risk Taking 3	When confronted with decisions involving uncertainty, my team typically adopts a bold posture.
Team Innovativeness 1	Our team places a strong emphasis on innovative and creative ideas in its methods of operation.

	Team Entrepreneurial Orientation (adapted from Fellnhofer et al., 2017)
Team Innovativeness 2	Our team is often the first coming up with new ideas related to new products, services, in-company processes, methods or other innovative improvements related to our business.
Team Innovativeness 3	In the last years, our team actively introduced improvements and innovations that have been usually quite dramatic.
Team Autonomy 1	In our team, working independently is considered to enhance creative thinking.
Team Autonomy 2	While working autonomously, we as a team ensure adequate coordination to minimize inefficiencies and duplication of efforts.
Team Autonomy 3	In our team we have a proper balance between patience and tolerance for autonomy of individuals and the forbearance to reduce or eliminate initiatives that are not succeeding.
Team Autonomy 4	We as a team implement necessary structural changes to stimulate new ideas.
Team Autonomy 5	We as a team foster the necessary culture, rewards, and processes to support product and service champions.

B. **Team-Perceived Heterogeneity**

	Team-Perceived Heterogeneity (adapted from Campion et al., 1993 and Fellnhofer et al., 2017)
Team-Perceived Heterogeneity 1	The members of my team vary widely in their areas of expertise.
Team-Perceived Heterogeneity 2	The members of my team have variety of different backgrounds.
Team-Perceived Heterogeneity 3	The members of my team have skills and abilities that complement each other.
Team-Perceived Heterogeneity 4	The members of team are diverse in terms of their professional experience.

C. **Individual Creative Mindset (Growth & Fixed)**

	Individual Creative Mindset (adapted from Karwowski, 2014)
Growth-Creative Mindset 1	Everyone can create something great at some point if he or she is given appropriate conditions.
Fixed-Creative Mindset 1	You either are creative or you are not—even trying very hard you cannot change much.

	Individual Creative Mindset (adapted from Karwowski, 2014)
Growth-Creative Mindset 2	Anyone can develop his or her creative abilities up to a certain level.
Fixed-Creative Mindset 2	You have to be born a creator—without innate talent you can only be a scribbler.
Growth-Creative Mindset 3	Practice makes perfect—perseverance and trying hard are the best ways to develop and expand one's capabilities.
Fixed-Creative Mindset 3	Creativity can be developed, but one either is or is not a truly creative person.
Growth-Creative Mindset 4	Rome was not built in a day—each creativity requires effort and work, and these two are more important than talent.
Fixed-Creative Mindset 4	Some people are creative, others are not—and no practice can change it.
Growth-Creative Mindset 5	It does not matter what creativity level one reveals—you can always increase it.
Fixed-Creative Mindset 5	A truly creative talent is innate and constant throughout one's entire life.

D. **Creative outcome (Novelty & Quality of business ideas)**

	Novelty and Quality (adapted from Dean et al., 2006 and Ylitalo, 2017)
Novelty	Originality The degree to which the idea is not only rare but is also ingenious, imaginative, or surprising Paradigm relatedness The degree to which an idea preserves or modifies a paradigm
Quality: Workability	Acceptability The degree to which the idea is socially, legally, or politically acceptable Implementability The degree to which the idea can be easily implemented
Quality: Relevance	Applicability The degree to which the idea clearly applies to the stated problem Effectiveness The degree to which the idea will solve the problem
Quality: Specificity	Completeness The number of independent subcomponents into which the idea can be decomposed, and the breadth of coverage with regard to who, what, where, when, why, and how Implicational explicitness The degree to which there is a clear relationship between the recommended action and the expected outcome Clarity The degree to which the idea is clearly communicated

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Abstrakt

CEL: *Głównym celem badania jest wykrycie czy orientacja przedsiębiorcza na poziomie zespołu (ang. TEO: Team Entrepreneurial Orientation) ma wpływ na generowanie kreatywnych (nowatorksich i jakościowych) pomysłów biznesowych. Orientacja przedsiębiorcza (ang. EO: Entreprenurial Orientation), rzadko była mierzona na poziomie zespołu i rzadko w odniesieniu do rzeczywistych i twórczych wyników zespołów przedsiębiorczych. Dlatego też, zaproponowany model badawczy poszukuje nowych wzorców, które mogą sprzyjać kreatywności zespołów przedsiębiorczych. Badanie dodaje moderujący efekt postrzeganej heterogeniczności zespołu i indywidualnego kreatywnego myślenia (wzrostowe i stałe kreatywne myślenie; ang. Growth/Fixed-Creative Mindset) jako zmienne warunkowe, aby lepiej zrozumieć,*

*w jakich okolicznościach zespoły przedsiębiorcze generują kreatywne pomysły biznesowe.**METODYKA:** Próba badawcza obejmuje zespoły przedsiębiorców z Mondragon Team Academy w Kraju Basków w Hiszpanii. Dane ankietowe zostały zebrane po tym jak zespoły przedsiębiorców ukończyły proces generowania pomysłów biznesowych. Zastosowany eksperyment nie został stworzony na potrzeby badania, ale wpisuje się w naturalne procesy wyselekcjonowanej próby zespołów. Nowatorstwo i jakość pomysłów biznesowych zostały ocenione przez ekspertów w tej dziedzinie. Zależności danych analizowano za pomocą modelowania cząstkowych równań strukturalnych najmniejszych kwadratów - PLS-SEM.**WYNIKI:** Orientacja przedsiębiorcza zespołów może prowadzić do wejścia na rynek produktów, ale niekoniecznie nowatorskich. Orientacja przedsiębiorcza zespołów bardziej wpływa na ich tendencję do generowania/modyfikowania wysokiej jakości już istniejących pomysłów biznesowych niż do generowania nowatorskich możliwości rynkowych. Efekty moderacji prezentują różne wyniki interakcji z badanymi zależnościami. W szczególności osoby o stałym (ang. fixed) kreatywnym myśleniu w zespole mają antagonistyczną interakcję w relacji TEO-Jakość. Postrzegana heterogeniczność zespołu i wzrostowe (ang. growth) kreatywne myślenie jednostek nie ma wpływu ani na powiązanie TEO-Jakość, ani TEO-Nowatorstwo. **IMPLIKACJE:** Badanie wykazuje znaczenie konceptualizacji natury kreatywności w EO jako kluczowego poprzednika innowacji rynkowych. Nasze badanie wzbogaca literaturę i praktykę, dostarczając dowodów na to, że EO na poziomie zespołu (TEO) odgrywa kluczową rolę w eksploracji wysoko jakościowych pomysłów biznesowych. Jednakże, orientacja przedsiębiorcza zespołów nie przyczynia się do nowatorskich rezultatów. Ponadto, należy redukować liczbę osób o stałym (ang. fixed) kreatywnym sposobie myślenia w zespole, gdyż blokują one eksplorację jakościowych pomysłów biznesowych. Nasze badanie potwierdza zasadność orientacji przedsiębiorczej na poziomie zespołu, co może pomóc w opracowaniu odpowiednich praktyk tworzenia lub zarządzania zespołem i ich kreatywnością. **ORYGINALNOŚĆ I WARTOŚĆ:** W badaniu zastosowano rzadko spotykaną w literaturze analizę EO na poziomie zespołu i na poziomie młodych firm (start-up). Badanie przyczynia się do pominiętej w literaturze konceptualizacji EO w teorii „twórczej destrukcji" Schumpetera (1934). Zastosowany w badaniu powrót do teoretycznych podstaw EO doprowadził do wyraźniejszego ukazania efektów behawioralnych zespołów przedsiębiorczych w kierunku tworzenia pomysłów biznesowych. Badanie inicjuje, identyfikuje i wzywa do nowych i dalszych linii badawczych, które przyczynią się do lepszego i przede wszystkim warunkowego zrozumienia, w jaki sposób zespoły przedsiębiorcze generują kreatywne pomysły biznesowe, w szczególności nowatorskie pomysły biznesowe, które są niezbędne do „twórczej destrukcji", teoretycznej podstawy konstruktu EO i ogólnego rozwoju gospodarczego.*

***Slowa kluczowe:** przedsiębiorczość, kreatywność, zespół, orientacja przedsiębiorcza, twórcze rezultaty*

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Conflicts of interest

The authors declare no conflict of interest.

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Subjective norms and entrepreneurial intention: A moderated-serial mediation model

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Abstract

PURPOSE: *This study aims to clarify the effect mechanism of subjective norms on entrepreneurial intention. The results of how subjective norms contribute to forming start-up intention are inconsistent and unclear, which is notable in previous research. By integrating the theory of planned behavior and the theory of self-efficacy, we investigate whether entrepreneurial self-efficacy and attitude toward entrepreneurship serially mediate the relationship between subjective norms and intention to start a business. In addition, this study examines the moderate role of entrepreneurial education on the serial indirect effect of subjective norms on entrepreneurial intention via entrepreneurial self-efficacy and attitude toward entrepreneurship.* ***METHODOLOGY:*** *This study utilized a sample of 958 master's students in Vietnam to investigate a moderated-serial mediation model of subjective norms on entrepreneurial intention. Confirmatory factor analysis (CFA) was carried out to check the reliability and validity of the scales. Then, the SPSS PROCESS macro developed by Hayes was employed to test the research model. Specifically, Model 6 was used to examine the serial indirect effect of subjective norms on start-up intention and Model 84 was implemented to investigate the moderate effect of entrepreneurial*

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education. ***FINDINGS:*** *The results of this study found that entrepreneurial self-efficacy and entrepreneurial attitude significantly mediate subjective norms' effect on entrepreneurial intention. Especially, the results reveal that the serial mediation effect of entrepreneurial self-efficacy and attitude toward entrepreneurship was significant and entrepreneurial self-efficacy and attitude toward entrepreneurship played a fully mediating role in the relationship between subjective norms and start-up intention. In addition, this study found that the serial mediation effect of subjective norms on start-up intention via entrepreneurial self-efficacy and entrepreneurial attitude was negatively moderated by entrepreneurial education.* ***IMPLICATIONS:*** *The results of this study further clarify the relationship between subjective norms and entrepreneurial intention and the role of entrepreneurial education, therefore, contributing to narrowing the notable gap between this relationship. Besides, our study provides several implications for governments and policymakers to promote the intention to start a business. The finding of our study indicates that subjective norms are an important factor in promoting entrepreneurial intention. Therefore, policymakers should take some actions to promote entrepreneurial culture, such as strengthening propaganda activities to promote the image of successful entrepreneurs, praising businesses and entrepreneurs who contribute to society, and giving evidence of their contribution to the development of the country. Promoting an entrepreneurial culture may increase peer group pressure on potential entrepreneurs, thus enhancing the intention to start a business.* ***ORIGINALITY AND VALUE:*** *This study expects to contribute to a better understanding of the effect mechanism of subjective norms on entrepreneurial intention and explain the role of entrepreneurial education in this relationship. This study explores the mediating role of entrepreneurial self-efficacy and entrepreneurial attitude in the relationship between subjective norms and the intention to start a business. Additionally, this study demonstrates that entrepreneurial education weakens the serial mediation model of subjective norms on the intention to start a business.*

Keywords: *subjective norm, entrepreneurial self-efficacy, attitude toward entrepreneurship, entrepreneurial intention, entrepreneurial education, the theory of planned behavior, the theory of self-efficacy, moderated-serial mediation model*

INTRODUCTION

Entrepreneurship is becoming a worldwide phenomenon because of its positive contribution to global economic development. In industrialized countries, entrepreneurship has long been seen as a way to promote innovation and technological development, enhance competitive ability and create jobs (Guerrero, Rialp, & Urbano, 2006). Meanwhile, in less advanced countries, entrepreneurship has been seen as a means to promote economic development and solve pressing economic and social issues (Ozaralli & Rivenburgh, 2016). To understand why one chooses to start a business, it is necessary to understand business intentions and the factors that influence

them. This argument is derived from Ajzen's (1991) view that intention is the starting point of behavior. Therefore, scholars have developed many theories to explore the determinants of individuals' entrepreneurial intentions (Maheshwari, Kha, & Arokiasamy, 2022). Although there are many theories determining entrepreneurial intention, TPB theory is more widely applied because it is a theory with high reliability and a good predictor of intention to perform actual behavior over many different areas.

According to the theory of planned behavior (TPB) of Ajzen (1991), the three antecedents of behavioral intention are attitude toward behavior, subjective norms and perceived behavior control. Subjective norms are seen as an important antecedent to predicting intention in the TPB model of Ajzen (1991). The relationship between subjective norms with intention has been proven in various field of research. However, the results about the effect of subjective norms on the intention to start a business are inconsistent. Some studies suggested that subjective norms were significantly correlated with business intention (Ahmed, Chandran, Klobas, Liñán, & Kokkalis, 2020; Maresch, Harms, Kailer, & Wimmer-Wurm, 2016), while other studies suggested that this relationship was not statistically significant (Otache, Umar, Audu, & Onalo, 2019; Tung, Hung, Phuong, Loan, & Chong, 2020). This raises a question: why are there inconsistent results regarding the association between subjective norms and entrepreneurial intention? Scholars have suggested that when the effect between the independent variable and the dependent variable is inconsistent, there may be a mediator variable in this relationship. In addition, Liñán and Chen (2009) also argue that the weak predictive power of subjective norms could be explained by the indirect effect of subjective norms on entrepreneurial intention. Therefore, it is necessary to research the effect mechanism of subjective norms on the intention to start a business for a better understanding of the phenomenon (Duong et al., 2022; Liñán & Chen, 2009).

From the above discussion, while current literature suggests that there is a positive linkage between subjective norms and entrepreneurial intention (Ahmed et al., 2020; Maresch et al., 2016), the mechanism of this linkage has not been fully understood. Thus, this study aims to clarify the effect mechanism of subjective norms on entrepreneurial intention based on two fundamental theories, namely the theory of planned behavior (Ajzen, 1991) and the theory of self-efficacy (Bandura, 1997), which are the most used in explaining and predicting behavior (Lortie & Castogiovanni, 2015). The main idea of the theory of self-efficacy is that an individual's intention and behavior are significantly affected by their belief in successfully performing a task (Bandura, 1997). This theory helps to give a better understanding of the nexus among beliefs, attitudes, intentions, and behavior. Meanwhile, the theory

of planned behavior suggested that an individual's intention has a strong association with attitudes toward behavior, while behavioral attitude may be correlated with normative beliefs (known as subjective norms) because they may be based in part on the same information (Ajzen & Fishbein, 2005). Based on these views, this study argues that in addition to the direct effect of subjective norms on entrepreneurial intention, subjective norms indirectly influence start-up intention through entrepreneurial self-efficacy and attitude toward entrepreneurship. We present entrepreneurial self-efficacy and attitude toward entrepreneurship as first and second mediators in the relationship between subjective norms and intention to start a business. We argue that subjective norms may be sequentially associated with self-efficacy and later positively affect attitude toward entrepreneurship, which, in turn, directly impact entrepreneurial intention.

Besides that, recent studies have demonstrated that entrepreneurial education is important in predicting entrepreneurial intention (Ndofirepi, 2020; Shah, Amjed, & Jaboob, 2020). However, the finding on the influence of entrepreneurial education on the intention to start a business is still inconsistent and unclear (Hassan, Anwar, & Saleem, 2021; Otache, Edopkolor, & Kadiri, 2022). Furthermore, scholars argue that entrepreneurial education can have moderate effects on the relationship between predictors and entrepreneurial intention (Entrialgo & Iglesias, 2016; Shah et al., 2020). So, in this study, we examine the moderating role of entrepreneurial education in the relationship between subjective norms, entrepreneurial self-efficacy, attitude toward entrepreneurship, and start-up intention. We expect to contribute to a better understanding of the effect mechanism of subjective norms on entrepreneurial intention and explain the reason for the inconsistent results about this relationship seen in previous studies.

In the past decade, Vietnam has not only become an emerging economy in Southeast Asia but it is also seen as a country with a significant growth rate of entrepreneurship. Business startups are increasing rapidly and have been identified as an important driver of Vietnam's economic development in recent years (Hoang, Le, Tran, & Du, 2020; Nguyen, Do, Vu, Dang, & Nguyen, 2019). However, the percentage of people who intend to become entrepreneurs in Vietnam just reached 25% in 2017 and ranked 19th out of 54 economies (GEM 2017/2018). Therefore, it is meaningful to explore entrepreneurial intention in Vietnam. The research results could provide sufficient suggestions for policymakers to promote entrepreneurship in Vietnam.

In sum, we employed a sample of 958 master's students in Vietnam to investigate a moderated-serial mediation model of subjective norms on entrepreneurial intention. The SPSS PROCESS macro developed by Hayes (2012) was employed to test the research model. The remainder of

this article includes four parts. First, the literature review and hypotheses' development are presented. Second, research methods are explained. Then, the research results are presented and discussed. Finally, the implications of the findings are highlighted, and the limitations of the study and further research directions are given.

LITERATURE REVIEW

Subjective norms and entrepreneurial intention

In the entrepreneurial literature, entrepreneurial intention is defined as a person's self-recognition that they intend to set up a new business and consciously plan to do so in the future (Thompson, 2009). Intention can help explain why a person plans to start a business before they look for a business opportunity (Krueger, Reilly, & Carsrud, 2000; Y.-S. Wang, Lin, Yeh, Li, & Li, 2016) and is a prerequisite factor for predicting entrepreneurial behavior (Duong, 2021; Yousaf, Ali, Ahmed, Usman, & Sameer, 2021). Meanwhile, subjective norms refer to a person's perception of the opinions of social reference groups (such as family and friends) about whether or not they should start a business (Ajzen, 1991). Based on the argument of the TPB model, scholars posit that the more positive the opinion of the reference group about entrepreneurship, the more support the person receives from this reference group and thus the higher intention to start a business. The linkage between subjective norms and entrepreneurial intention has been examined in many empirical studies (Duong, 2021; Sun, Lo, Liang, & Wong, 2017). However, there is inconsistency in the finding regarding this linkage. One group of studies illustrated that subjective norms positively influence entrepreneurial intention (Ahmed et al., 2020; Maresch et al., 2016; Shah et al., 2020).

Another group of studies reported that subjective norms have no impact, not even a negative impact on entrepreneurial intention (Duong, 2021; Tung et al., 2020). In addition, several researchers suggested that the nexus between subjective norms and intention to start a business is not direct, but some intervening factors mediate or moderate this nexus (Liñán & Chen, 2009). For example, some studies have explored the moderate role of gender, educational fields, country, creativity, and regional conditions in the linkage between subjective norms and entrepreneurial intention (Duong, 2021; González-Serrano, Valantine, Hervás, Pérez-Campos, & Moreno, 2018; Kibler, 2013; Pauline & T, 2019; Shi, Yuan, Bell, & Wang, 2020). Similarly, some studies reported the mediate roles of perceived behavior control, and attitude toward behavior (Doanh & Bernat, 2019; Duong, 2021)). The findings of these studies

imply that the relationship between subjective norms and entrepreneurial intention is not just a simple direct relationship. Therefore, this study introduces entrepreneurial self-efficacy and attitude toward entrepreneurship as mediators, and entrepreneurial education as a moderator in the association between subjective norms and entrepreneurial intention (Figure 1).

Mediating effect of entrepreneurial self-efficacy

In the theory of self-efficacy (Bandura, 1997), self-efficacy is seen as a key construct in regulating psychological well-being, physical health, psychological problems and career choices (Liguori, Winkler, Vanevenhoven, Winkel, & James, 2019). Bandura (1997) suggested that individual behaviors are regulated by their cognition, and that self-efficacy, a cognitive factor, is a central motivator for a person to maintain their self-regulation. In the entrepreneurship field, more and more research is emphasizing the role of self-efficacy, which is known as the term entrepreneurial self-efficacy. Entrepreneurial self-efficacy is defined by scholars from many different perspectives (Tsai, Chang, & Peng, 2016). And in this study, we inherited the definition that entrepreneurial self-efficacy is an entrepreneur's confidence in being able to complete specific tasks (Baum, Locke, & Smith, 2001). Several previous studies confirmed that self-efficacy has a positive relation to social support, when a person perceived support from their family or friends, they will have higher self-efficacy (Adler-Constantinescu, Beşu, & Negovan, 2013). Otherwise, subjective norms reflect a person's perception of social reference groups' opinions about whether they should implement a behavior (Ajzen, 1991). The more positive these opinions are, means the more support they receive from the social group and, therefore, the higher self-efficacy they have. In addition, Santos and Liguori (2020) argued that subjective norms help to form how a person perceived themselves, influence their belief about self-efficacy, and consequently affect the likelihood of shaping specific intentions. Doanh and Bernat (2019) also suggested that subjective norms have a positive influence on self-efficacy. In other words, an individual's entrepreneurial self-efficacy may be enhanced if they receive approval about entrepreneurship from important persons and vice versa.

More than that, entrepreneurial self-efficacy has a strong relationship with the intention to start a business. Bandura (1982) suggested that an individual's intentions are significantly influenced by beliefs about their ability to perform this particular task effectively. A person's beliefs can influence their intentions and behavior (Ajzen, 1991). A person with high confidence in his/her ability to perform a particular task may have a high intention to achieve this particular achievement (Bandura, 1982). In other words, a person

with high confidence in starting a business will have a higher intention to start a business. The relationship between entrepreneurial self-efficacy and entrepreneurial intention has been supported in many previous studies (Ahmed et al., 2020; Doanh & Bernat, 2019; Tsai et al., 2016). Researchers have shown that when a person has high self-efficacy, their intention to engage in entrepreneurship is higher (Duong & Le, 2021; Maheshwari & Kha, 2022; Wardana et al., 2020).

Given a strong correlation of entrepreneurial self-efficacy to both subjective norms and entrepreneurial intention as mentioned above, entrepreneurial self-efficacy may play a mediator role in the relationship between subjective norms and entrepreneurial intention. Thus, we posit that:

H1: Entrepreneurial self-efficacy plays a mediating role between subjective norms and entrepreneurial intention.

Mediating effect of attitude toward behavior

Attitude toward entrepreneurship reflects the degree to which a person thinks positively or negatively about being an entrepreneur (Autio, Keeley, Klofsten, Parker, & Hay, 2010). Becoming an entrepreneur or not is an important decision because it affects later careers, so individuals often consult with important people around them. When people around think that starting a business is the right path and will help generate more income than earning a salary, it helps build individuals' belief that the results of starting a business are positive, so their attitude towards entrepreneurial behavior will be positive. Several previous studies have demonstrated the positive effect of subjective norms on attitude toward entrepreneurship (Duong, 2021; Entrialgo & Iglesias, 2016; Farooq et al., 2018).

In addition, a positive attitude towards entrepreneurial behavior can lead to a stronger intention to start a business. Based on the theory of planned behavior (Ajzen, 1991), many studies have confirmed that a positive attitude toward entrepreneurial activities can significantly contribute to the formation of an individual's intention to become an entrepreneur (Ashraf, Alam, & Alexa, 2021; Duong, 2021; Zaremohzzabieh et al., 2019). When an individual believes that the result of becoming an entrepreneur is positive, they will have a favourable entrepreneurial attitude, and therefore their entrepreneurial intention will be more enhanced.

Given a strong correlation of attitude toward entrepreneurship to both subjective norms and entrepreneurial intention as mentioned above, attitude toward entrepreneurship may play a mediator role in the relationship between subjective norms and entrepreneurial intention. In other words, subjective

norms first positively influence attitude toward entrepreneurship, which in turn, positively impacts entrepreneurial intention. Thus, we posit that:

H2: Attitude toward entrepreneurship plays a mediating role between subjective norms and entrepreneurial intention.

Serial mediating role of entrepreneurial self-efficacy and attitude toward entrepreneurship

Entrepreneurial self-efficacy is known as an individual's belief in his/her capability to become a successful entrepreneur (Tsai et al., 2016). People will value themselves positively when they believe they could deal with business activities (Ajzen, 1991; Kolvereid, 1996). The theory of reasoned actions proposed that an individual's attitude toward a behavior is the result of their beliefs (Fishbein & Ajzen, 1975). Meanwhile, entrepreneurial self-efficacy is a knowledge-based belief and, therefore, entrepreneurial self-efficacy can lead to a positive attitude towards creating new businesses. When a person has high confidence in their entrepreneurial ability, their belief about establishing a successful venture will be developed, and this belief then promotes a favorable attitude toward entrepreneurship. In addition, Ajzen (1991) argued that the belief about the ability to perform a particular behavior could influence attitude toward that behavior and its outcomes, affecting the intention to accomplish that behavior. This argument implies that attitude toward behavior may mediate the nexus of entrepreneurial self-efficacy and entrepreneurial intention. The mediation role of attitude toward entrepreneurship in the relationship between entrepreneurial self-efficacy and entrepreneurial intention was demonstrated in previous studies (Setiawan, Kasim, & Ardyan, 2022; Tsai et al., 2016; Wardana et al., 2020).

From these correlations, it seems that when an individual perceives support from reference groups, they may increase their entrepreneurial self-efficacy, which in turn leads to a positive attitude toward entrepreneurship and thereby enhance the intention to start a business. In other words, entrepreneurial self-efficacy and attitude toward entrepreneurship may co-play a serial mediating role in the relationship between subjective norms and entrepreneurial intention. Thus, we posit that:

H3: Entrepreneurial self-efficacy and attitude towards entrepreneurship co-play a serial mediating role in the relationship between subjective norms and entrepreneurial intention.

Entrepreneurial education as moderator

Entrepreneurial education refers to education programs that aim to provide students with essential knowledge and skills to establish a business (Otache et al., 2022). The role of entrepreneurial education in forming start-up intention is a hot topic that attracts more attention from scholars and policy-makers (Hoang et al., 2020). However, while previous studies often focus on examining the direct or indirect effects of entrepreneurial education, only a few studies explore the moderate role of this factor (Shahab, Chengang, Arbizu, & Haider, 2019).

Several prior studies have proved that the direct effect of subjective norms on entrepreneurial intention was moderated by entrepreneurial education (Maresch et al., 2016; Shah et al., 2020). Shah et al. (2020) also found that entrepreneurial education weakens the direct effect of subjective norms on start-up intention. When a person receives entrepreneurial education, they would have the ability to understand entrepreneurship clearly and, therefore, they might be less reliant on their social reference groups. Likewise, this study argues that entrepreneurial education negatively moderates the direct effect of subjective norms on entrepreneurial self-efficacy and entrepreneurial attitude and the indirect effect of subjective norms on entrepreneurial intention via entrepreneurial self-efficacy and entrepreneurial attitude. Indeed, entrepreneurial education equips students with the necessary knowledge and skills that can enhance their entrepreneurial self-efficacy (Hassan et al., 2021; Hoang et al., 2020). In addition, entrepreneurial education for students also creates a positive awareness of entrepreneurial careers by convincing them of the values and benefits of starting a business (Yousaf et al., 2021). Therefore, students' entrepreneurial self-efficacy and attitude might be less reliant on the opinions of reference groups. In other words, the positive direct effects of subjective norms on entrepreneurial self-efficacy and attitude, and the positive indirect effect of subjective norms on entrepreneurial intention via entrepreneurial self-efficacy and entrepreneurial attitude, may be weaker in individuals who receive entrepreneurial education.

Based on the arguments above, we posit that:

H4: Entrepreneurial education negatively moderates the effect of subjective norms on entrepreneurial self-efficacy.

H5: Entrepreneurial education negatively moderates the effect of subjective norms on attitude toward entrepreneurship.

H6: Entrepreneurial education negatively moderates the indirect effect of subjective norms on entrepreneurial intention via entrepreneurial self-efficacy.

H7: Entrepreneurial education negatively moderates the indirect effect of subjective norms on entrepreneurial intention via attitude toward entrepreneurship.

H8: Entrepreneurial education negatively moderates the indirect effect of subjective norms on entrepreneurial intention via entrepreneurial self-efficacy and attitude toward entrepreneurship.

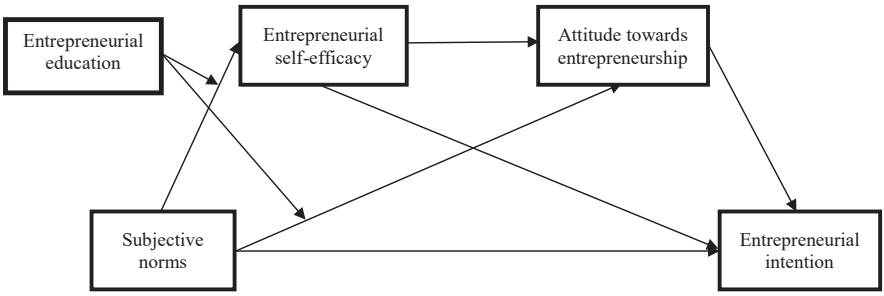

Figure 1. Conceptual model

Methodology

Sample and procedures

To test the proposed hypotheses, this article uses a sample including 958 responses. The questionnaires were distributed to master's students in Vietnam by the convenient sampling method. The authors selected five universities in the North, three universities in the Central area and three universities in the South to conduct the survey. In the process of collecting research data, the authors tried to balance the proportion of students between different universities and disciplines to ensure the representativeness and reliability of the research samples. To achieve the expected sample size, the authors surveyed over a period of nearly two months (from January to February 2022). A total of 1265 survey questionnaires were distributed to master's students through online surveys, and the number of returned questionnaires was 1038 (reaching 81.9%). After removing invalid answer sheets because survey participants did not fully answer or answer without thinking, the final research sample includes 958 survey questionnaires. Among them, the ratio of male/female students is relatively balanced, with 560 male students (accounting for 58.5%) and 398 female students (accounting for 41.5%). The majority of master's students participating in the survey are from 24 to 28 years old (accounting for 42.3%). In terms of fields of study, 58.5% of students surveyed

studied economics and business administration, while engineering and other disciplines accounted for 41.5%. In addition, almost half of the participants in the survey had parents or siblings working in business, the other half had parents and siblings working in other jobs (see Table 1).

Table 1. Demographic characteristics of sample

Variable	Categories	n	%
Gender	Male	560	58.5
	Female	398	41.5
Age	22-23	151	15.8
	24-28	405	42.3
	Over 28	402	42.0
Fields of study	Economics and business management	560	58.5
	Engineering and others	398	41.5
Family background	Yes	472	49.3
	No	486	50.7

Measures

Entrepreneurial intention was measured with a six-item scale adopted from Liñán and Chen (2009). Subjective norms were assessed by using a three-item scale adopted from Liñán and Chen (2009). A five-item scale from Liñán (2008) and Tsai et al. (2016) was adopted to measure entrepreneurial self-efficacy. Attitude toward entrepreneurship was measured with a five-item scale adopted from Liñán and Chen (2009). And entrepreneurial education was assessed by using a four-item scale adopted from Walter and Block (2016). Each item is rated on a seven-point Likert scale (1 = totally disagree, 7 = totally agree).

Before developing the survey, all scales are translated from English to Vietnamese, and then re-translated back into English to ensure that the meaning of the scales is not changed. These two translations are performed independently by two experienced English experts in the fields of Economics and Business Administration.

Data analysis

In the current study, the research data was analyzed using AMOS 24.0 and SPSS 24.0. First, we adopted SPSS to perform descriptive and correlational analyses. Pearson's correlation was employed to examine the association among all the variables. Subsequently, confirmatory factor analysis (CFA) was carried out to check the reliability and validity of the scales. Then, the

SPSS PROCESS macro developed by Hayes (2012) was employed to test the research model. Specifically, PROCESS macro with Model 6 (Hayes, 2018) was used to examine the serial indirect effect of subjective norms on start-up intention and PROCESS macro with Model 84 (Hayes, 2018) was implemented to investigate the moderate effect of entrepreneurial education. In addition, demographic variables such as gender (0 = male, 1 = female), age (0 = 22-23, 1 = 24-28, 2 = over 28), the field of study (0 = Economics and business management, 1 = Engineering and others) and family business background (0 = No, 1 = Yes) were added to the research model as control variables to ensure the reliability of results.

RESULTS

Descriptive statistics

The mean and standard deviations of all variables used in the research model are shown in Table 2. This table also illustrates the correlation between all variables. Subjective norms were positively and significantly related to entrepreneurial intention ($r = 0.697$, $p < 0.01$), attitude toward entrepreneurship ($r = 0.812$, $p < 0.01$), entrepreneurial self-efficacy ($r = 0.729$, $p < 0.01$), and entrepreneurial education ($r = 0.623$, $p < 0.01$). Likewise, entrepreneurial self-efficacy was positively associated with entrepreneurial intention ($r = 0.739$, $p < 0.01$), attitude toward entrepreneurship ($r = 0.763$, $p < 0.01$), and entrepreneurial education ($r = 0.488$, $p < 0.01$). Attitude toward entrepreneurship was positively correlated to entrepreneurial intention ($r = 0.815$, $p < 0.01$), and entrepreneurial education ($r = 0.636$, $p < 0.01$); and entrepreneurial education was positively associated with entrepreneurial intention ($r = 0.569$, $p < 0.01$). In addition, the skewness and kurtosis values of all variables range from -1 to 1. Therefore, the departures from the normal distribution are not substantial (Kline, 2016).

Table 2. The results of descriptive statistics and Pearson-correlations between main variables

	Mean	SD	EI	ATE	ESE	SN	EE
Entrepreneurial intention (EI)	4.7029	1.4987	-				
Attitude toward behavior (ATE)	4.8846	1.4074	0.815**	-			
Entrepreneurial self-efficacy (ESE)	4.4647	1.4544	0.739**	0.763**	-		
Subjective norm (SN)	4.9850	1.4210	0.697**	0.812**	0.729**	-	
Entrepreneurial education (EE)	5.3387	1.34071	0.569**	0.636**	0.488**	0.623**	-

Note: N=958, ** Correlation is significant at the 0.01 level (2-tailed).

Measurement model

To examine the fit of the measurement model, we performed a confirmatory factor analysis. The χ2 statistics show a not good result (χ2=1188.032, p=0.000; χ2/df=5.500), however, χ2 statistics do not reflect exactly the fit of the model when the sample size is large. Therefore, this measure has usually been ignored in many studies (Kenny, Kaniskan, & McCoach, 2015). Considering the other indicators, the measurement model has a good fit with the data: CFI = 0.964, SRMR = 0.035, and RMSEA = 0.068 (Hu & Bentler, 1999).

Besides, the CFA results also show the standardized regression weights (λi). All observed variables have standardized regression weights greater than 0.8, which confirms the unidirectionality and convergence validity of the scales used in the proposed model. Therefore, all observed variables are suitable and do not need to be removed (Hair, Black, Babin, Anderson, & Tatham, 2010). The observed variable with the smallest standardized regression weight is ATE1 (0.832) and the one with the highest regression weight is SN2 (0.939).

In addition, the composite reliability (CR), average variance extracted (AVE) and maximum shared variance (MSV) were examined to assess the reliability, convergence validity, and discriminability validity of the scale. The CR for each factor is greater than 0.9, thus all scales present good reliability (Hair et al., 2010). Besides, the convergent validity of five factors is also ensured due to their AVE being higher than 0.5. Furthermore, the MSV of all factors is lower than their AVE, therefore, all factors meet the requirements of convergent validity (see Table 3).

Table 3. Cronbach's alpha and composite reliability and discriminant validity index

Code	Items	Cronbach's Alpha	Factor loading	CR	AVE	MSV
Entrepreneurial Intention - EI						
EI1	I am ready to do anything to be an entrepreneur	0.941	0.854	0.959	0.794	0.740
EI2	My professional goal is to become an entrepreneur		0.898			
EI3	I will make every effort to start and run my own firm		0.895			
EI4	I am determined to create a firm in the future		0.907			
EI5	I have very seriously thought of starting a firm		0.895			
EI6	I have a firm intention to start a firm someday		0.895			

Code	Items	Cronbach's Alpha	Factor loading	CR	AVE	MSV
Attitude Toward Entrepreneurship - ATE						
ATE1	Being an entrepreneur implies more advantages than disadvantages to me	0.944	0.832	0.945	0.776	0.740
ATE2	A career as an entrepreneur is attractive for me		0.919			
ATE3	If I had the opportunity and resources, I'd like to start a firm		0.847			
ATE4	Being an entrepreneur would entail great satisfactions for me		0.912			
ATE5	Among various options, I would rather be an entrepreneur		0.891			
Entrepreneurial Self-Efficacy - ESE						
ESE1	I show great aptitude for creativity and innovation	0.935	0.837	0.929	0.724	0.690
ESE2	I show great aptitude for leadership and problem-solving		0.847			
ESE3	I can develop and maintain favorable relationships with potential investors		0.839			
ESE4	I can see new market opportunities for new products and services		0.862			
ESE5	I can develop a working environment that encourages people to try out something new		0.868			
Subjective Norms - SN						
SN1	My family members will approve my actions	0.936	0.866	0.938	0.834	0.713
SN2	My family members will encourage me to start my business		0.939			
SN3	If necessary, my family members will loan me money to help me start my own business.		0.932			
Entrepreneurial Education - EE				0.947	0.847	0.431
EE1	My school education helped me develop my sense of initiative – a sort of entrepreneurial attitude	0.946	0.882			
EE2	My school education helped me to better understand the role of entrepreneurs in society		0.932			
EE3	My school education made me interested to become an entrepreneur		0.938			
EE4	My school education gave me the skills and know-how that enable me to run a business		0.928			

Results of mediate effects

This study investigates subjective norms as a predictor, entrepreneurial self-efficacy and attitude toward entrepreneurship as mediators, and intention to form a venture as an outcome variable.

Table 4 reported the results of serial mediation analyses. The results show that subjective norms positively affect entrepreneurial self-efficacy (B

= 0.7161; p < 0.001) and attitude toward entrepreneurship (B = 0.5396; p < 0.001). Similarly, entrepreneurial self-efficacy has significant positive impacts on entrepreneurial attitude (B = 0.3512; p < 0.001) and entrepreneurial intention (B = 0.2630; p < 0.001); and attitude toward entrepreneurship positively influences entrepreneurial intention (B = 0.6284; p < 0.001). The results indicated that subjective norms had a significant and indirect impact on the intention to form a venture via entrepreneurial self-efficacy ($B_{SN\text{-}ESE\text{-}EI}$ = 0.1883; 95%CI: 0.1408 to 0.2380) and entrepreneurial attitude ($B_{SN\text{-}ATE\text{-}EI}$ = 0.3391; 95%CI: 0.2752 to 0.4099). Interestingly, subjective norms were found to have an indirect effect on start-up intention via a serial mediating of entrepreneurial self-efficacy and attitude toward behavior ($B_{SN\text{-}ESE\text{-}ATE\text{-}EI}$ = 0.1580; 95%CI: 0.1215, 0.1985). Consequently, H1, H2, and H3 were supported by data. Furthermore, the total effect of subjective norms on the intention to start a business was significant (B = 0.6999; 95%CI: 0.6518, 0.7480). However, when entrepreneurial self-efficacy and attitude toward entrepreneurship were exerted in the research model as mediators, the direct effect of subjective norms on start-up intention was not significant (95%CI: -0.0509 to 0.0797). This result implies that entrepreneurial self-efficacy and attitude toward entrepreneurship play significant fully mediating roles in the nexus between subjective norms and entrepreneurial intention.

Table 4. The results of mediating effects

Hypotheses	Paths	B	SE	CI(95%)		
				Lower	Upper	
	Direct effect					
	SN -> ESE	0.7161***	0.0228	0.6714	0.7608	
	SN -> ATE	0.5396***	0.0248	0.4910	0.5883	
	SN -> EI	0.0144	0.0333	-0.0509	0.0797	
	ESE -> ATE	0.3512***	0.0247	0.3027	0.3996	
	ESE -> EI	0.2630***	0.0298	0.2045	0.3215	
	ATE -> EI	0.6284***	0.0356	0.5586	0.6982	
	Indirect effect					
H1(+)	SN -> ESE -> EI	0.1883	0.0246	0.1408	0.2380	*Supported*
H2(+)	SN -> ATE -> EI	0.3391	0.0346	0.2752	0.4099	*Supported*
H3(+)	SN -> ESE -> ATE -> EI	0.1580	0.0199	0.1215	0.1985	*Supported*
	Total effects					
	SN -> EI	0.6999***	0.0245	0.6518	0.7480	
	Covariates					
	Gender	-0.0848	0.0720	-0.2262	0.0566	

Hypotheses	Paths	B	SE	CI(95%)	
				Lower	Upper
	Age	-0.2397***	0.0495	-0.3368	-0.1425
	Major	-0.0397	0.0718	-0.1807	0.1013
	Family business background	-0.2559***	0.0703	-0.3938	-0.1180

Note: N=958, ; ***p < 0.001.

Results of moderate effects

After testing the serial mediation model, entrepreneurial education was added as a moderator in the relationship between subjective norms and entrepreneurial self-efficacy. The results of moderated-mediation effects were presented in Table 5.

The results illustrated that entrepreneurial education negatively moderated the effect of subjective norms on entrepreneurial self-efficacy (B = -0.0264; 95%CI: -0.0516 to -0.0011), therefore, H4 was supported by data. However, contrasting with our expectation, the moderate effect of entrepreneurial education on the relationship between subjective norms and entrepreneurial attitude was not significant (95%CI: -0.0143 to -0.0228), thus, H5 was not supported.

In terms of moderated-mediation effects, the results showed that the indirect effect of subjective norms on entrepreneurial intention via entrepreneurial self-efficacy was negatively moderated by entrepreneurial education (B = -0.0069; 95%CI: -0.0139; -0.0003), therefore, H6 was supported. Conversely, the indirect effect of subjective norms on start-up intention through entrepreneurial attitude was not moderated by entrepreneurial education (95%CI: -0.0114; 0.0165), thus, H7 was not supported. Interestingly, the moderated-mediation analyses illustrated that entrepreneurial education negatively moderated the serial mediation effect of subjective norms on entrepreneurial intention via entrepreneurial self-efficacy and start-up attitude (B = -0.0056; 95%CI: -0.0117; -0.0002), therefore, H8 was supported.

Moreover, the conditional indirect effects showed that the indirect effects of subjective norms on entrepreneurial intention via entrepreneurial self-efficacy and the serial indirect effects via entrepreneurial self-efficacy and attitude toward entrepreneurship were both positive and significant at three levels of entrepreneurial education. These results provide support for mediating roles of entrepreneurial self-efficacy and entrepreneurial attitude in the relationship between subjective norms and start-up intention.

Table 5. The results of moderate effects

Hypotheses	Paths	B	SE	CI(95%)		Results
				Lower	Upper	
	SN -> ESE					
H4(-)	EE x SN	-0.0264	0.0129	-0.0516	-0.0011	*Supported*
	SN -> ATE					
H5(-)	SN x ATE	0.0042	0.0095	-0.0143	0.0228	*Not supported*
	SN -> ESE -> EI					
	EE 1 SD below the mean	0.1872	0.0246	0.1388	0.2360	
	EE at the mean	0.1779	0.0239	0.1319	0.2268	
	EE 1 SD above the mean	0.1686	0.0241	0.1231	0.2178	
H6(-)	***Index of moderated mediation***	-0.0069	0.0035	-0.0139	-0.0003	*Supported*
	SN -> ATE -> EI					
	EE 1 SD below the mean	0.2670	0.0326	0.2050	0.3334	
	EE at the mean	0.2706	0.0322	0.2091	0.3356	
	EE 1 SD above the mean	0.2742	0.0345	0.2081	0.3432	
H7(-)	***Index of moderated mediation***	0.0027	0.0071	-0.0114	0.0165	*Not supported*
	SN -> ESE -> ATE -> EI					
	EE 1 SD below the mean	0.1516	0.0196	0.1159	0.1921	
	EE at the mean	0.1441	0.0183	0.1103	0.1815	
	EE 1 SD above the mean	0.1365	0.0179	0.1035	0.1727	
H8(-)	***Index of moderated-serial mediation***	-0.0056	0.0029	-0.0117	-0.0002	*Supported*

DISCUSSION

According to the theory of planned behavior (TPB) of Ajzen (1991), subjective norms are seen as an important antecedent to predicting intention and, consequently, predicting behavior. The association between subjective norms and intention has been proven in various fields of research. However, the result of how subjective norms contribute to forming start-up intention is still inconsistent (Doan et al., 2021; Zdolsek, Draksler, & Sirec, 2021). Some studies suggested that subjective norms were significantly correlated with business intention (Ahmed et al., 2020; Maresch et al., 2016), while other

studies suggested that this relationship was not statistically significant (Otache et al., 2019; Tung et al., 2020). This implies that the mechanism of the linkage between subjective norms and entrepreneurial intention has not been fully understood. Therefore, this study aims to explore the indirect influence of subjective norms on entrepreneurial intention. By combining the theory of planned behavior (Ajzen, 1991) and the theory of self-efficacy (Bandura, 1997), we present entrepreneurial self-efficacy and attitude toward entrepreneurship as serial mediators in the relationship between subjective norms and intention to start a business. We argue that subjective norms may be sequentially associated with self-efficacy and later positively affect attitude toward entrepreneurship, which, in turn, directly impact entrepreneurial intention. Additionally, this study also examines the moderate role of entrepreneurial education in the effect of subjective norms on self-efficacy, attitude toward entrepreneurship, and start-up intention.

First, in support of H1, the results of this study found that entrepreneurial self-efficacy significantly mediates the effect of subjective norms on the intention to start a business. This finding emphasizes the important role of subjective norms in directly promoting entrepreneurial self-efficacy and indirectly enhancing entrepreneurial intention. Although the nexus between subjective norms and entrepreneurial self-efficacy has not been researched much yet, current literature argues that self-efficacy is positively influenced by social support (S. Wang et al., 2020). Meanwhile, subjective norms are also known as social pressure/support and be an external motivation (Doanh & Bernat, 2019; Tsai et al., 2016). Therefore, when perceiving positive support from salient people, an individual could have a higher entrepreneurial self-efficacy, and then have a higher intention to start a business.

Second, as indicated by the finding, attitude toward entrepreneurship mediates the association between subjective norms and entrepreneurial intention, lending to support H2. A person with positive subjective norms will be more likely to have a higher intention to form a venture through enhancing a favorable entrepreneurial attitude, which is consistence with prior studies (Amofah & Saladrigues, 2022; Doanh & Bernat, 2019; Duong, 2021). In other words, when an individual perceived agreement about entrepreneurship from salient people, they would shape a positive entrepreneurial attitude, and then increase their intention to form a venture.

Third, the finding of the study revealed that entrepreneurial self-efficacy and attitude toward entrepreneurship mediated the effect of subjective norms on start-up intention through a serial mediation pathway, consistent with H3. The results show that subjective norms impact the intention to form a business through first entrepreneurial self-efficacy and then attitude toward entrepreneurship. Furthermore, when entrepreneurial self-efficacy

and entrepreneurial attitude were discussed as mediators in the research model, the direct effect of subjective norms on entrepreneurial intention was not significant, which demonstrated that the linkage between subjective norms and start-up intention was fully mediated by these two factors. This serial mediation model, thus, gives an in-depth explanation of the effect mechanism of subjective norms on entrepreneurial intention.

Finally, this study indicated that the serial mediation effect of subjective norms on start-up intention via entrepreneurial self-efficacy and entrepreneurial attitude was significantly moderated by entrepreneurial education. Specifically, entrepreneurial education negatively moderates the relationship between subjective norms and entrepreneurial self-efficacy. This means that when individuals engage in entrepreneurial education, the role of opinions from reference groups in building their entrepreneurial self-efficacy will be less important. Because entrepreneurial education equips them with the necessary start-up knowledge and skills, they become more confident in their entrepreneurial abilities (Nowiński, Haddoud, Lančarič, Egerová, & Czeglédi, 2017; Wardana et al., 2020). Similarly, the results also reveal that the serial mediation effect of subjective norms on entrepreneurial intention via entrepreneurial self-efficacy and entrepreneurial attitude was negatively moderated by entrepreneurial education. It means entrepreneurial education weakens the indirect positive effect of subjective norms on start-up intention via entrepreneurial self-efficacy and entrepreneurial attitude in serial.

CONCLUSION

The current study makes contributions to entrepreneurship knowledge at two levels. First, by integrating the theory of planned behavior (Ajzen, 1991) and the theory of self-efficacy (Bandura, 1997), this study contributes to narrowing the notable gap between subjective norms and entrepreneurial intention. In this study, we introduced entrepreneurial self-efficacy and attitude toward entrepreneurship as first and second mediators in the nexus of subjective norms and entrepreneurial intention. The results illustrate that entrepreneurial self-efficacy and attitude toward entrepreneurship played a full serial mediation role in the relationship between subjective norms and start-up intention. Second, this study also demonstrates that the indirect effects of subjective norms on entrepreneurial intention were negatively moderated by entrepreneurial education. Therefore, this study has further clarified the relationship between subjective norms and entrepreneurial intention.

Besides the theoretical contributions, the results of this study also provide implications for educators and policymakers. The finding of our study indicates that subjective norms are an important factor in promoting entrepreneurial intention. The opinions of the reference group will influence an individual's self-efficacy and entrepreneurial attitude, which in turn affects their intention to start a business. Moreover, although entrepreneurial education weakens the indirect and serial indirect effects of subjective norms on entrepreneurial intention, these effects are still both significant and positive at all levels of entrepreneurial education. This finding supports the important role of subjective norms in forming start-up intention. Therefore, policymakers should take some actions to promote entrepreneurial culture, such as strengthening propaganda activities to promote the image of successful entrepreneurs, praising businesses and entrepreneurs who contribute to society, and giving evidence of their contribution to the development of the country. Promoting an entrepreneurial culture may increase peer group pressure on potential entrepreneurs, thus enhancing the intention to start a business. In addition, educators should also consider the role of reference groups in forming students' entrepreneurial intentions. It is very helpful to get family, friends and other important persons in the entrepreneurial learning process, such as becoming guest speakers in class or attending the business project of students. This can make students aware of the potential approval or disapproval towards entrepreneurship of reference groups, thereby promoting or deferring the students' entrepreneurial intentions.

Similar to other studies, our study also has some limitations. The surveyed objective in this study only included master's students. Therefore, further studies could collect data from other objectives like high school students or workers to enhance the generalization of results. In addition, prior relevant studies suggested that subjective norms could be categorised into two types, named injunctive norms and descriptive norms (Manning, 2009; Shahab et al., 2019; Tsai et al., 2016). These two types of norms have different impacts on an individual's intention (Tsai et al., 2016). Thus, this study could be extended by investigating the influence of different norms on entrepreneurial intention through self-efficacy and attitude toward entrepreneurship. Furthermore, this study only borrows entrepreneurial education as a moderator in the relationship between subjective norms, entrepreneurial self-efficacy, attitude toward entrepreneurship, and start-up intention. Therefore, further studies could examine the moderate role of different factors in the indirect relationship between subjective norms and start-up intention.

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Appendix

Table I. The definition of variables in research model

Variables	Definition	Sources
Subjective norms	a person's perception of the opinions of social reference groups (such as family and friends) about whether or not they should start a business	Ajzen (1991)
Entrepreneurial self-efficacy	an entrepreneur's confidence in being able to complete specific tasks	Baum et al. (2001)
Attitude toward entrepreneurship	the degree to which a person thinks positively or negatively about being an entrepreneur	Autio et al. (2001)
Entrepreneurial intention	a person's self-recognition that they intend to set up a new business and consciously plan to do so in the future	Thompson (2009)
Entrepreneurial education	education programmes that aim to provide students with essential knowledge and skills to establish a business	Otache et al. (2022)

Abstrakt

CEL: *Niniejsze badanie ma na celu wyjaśnienie mechanizmu wpływu norm subiektywnych na intencje przedsiębiorcy. Wyniki dotyczące tego, jak subiektywne normy przyczyniają się do kształtowania intencji start-upu, są niespójne i niejasne, co można zauważyć we wcześniejszych badaniach. Integrując teorię planowanych zachowań i teorię własnej skuteczności, badamy, czy przedsiębiorcze poczucie własnej skuteczności i stosunek do przedsiębiorczości seryjnie pośredniczą w związku między subiek-*

tywnymi normami a zamiarem założenia firmy. Ponadto niniejsze badanie analizuje umiarkowaną rolę edukacji w zakresie przedsiębiorczości w szeregowym pośrednim wpływie subiektywnych norm na intencje przedsiębiorcze poprzez poczucie własnej skuteczności i nastawienie do przedsiębiorczości. ***METODYKA:*** *W badaniu tym wykorzystano próbę 958 studentów studiów magisterskich w Wietnamie w celu zbadania moderowanego modelu mediacji szeregowej subiektywnych norm dotyczących intencji przedsiębiorczych. W celu sprawdzenia rzetelności i trafności skal przeprowadzono konfirmacyjną analizę czynnikową (CFA). Następnie do przetestowania modelu badawczego wykorzystano makro SPSS PROCESS opracowany przez Hayesa. Konkretnie, Model 6 został wykorzystany do zbadania seryjnego pośredniego wpływu subiektywnych norm na intencje założenia firmy, a Model 84 został wdrożony do zbadania umiarkowanego wpływu edukacji w zakresie przedsiębiorczości.* ***WYNIKI:*** *Wyniki tego badania wykazały, że poczucie własnej skuteczności i postawa przedsiębiorcza znacząco pośredniczą w wpływie norm subiektywnych na intencje przedsiębiorcze. W szczególności wyniki ujawniają, że seryjny efekt mediacji poczucia własnej skuteczności i postawy przedsiębiorczości był znaczący, a poczucie własnej skuteczności i postawy przedsiębiorczości odgrywało rolę w pełni pośredniczącą w relacji między normami subiektywnymi a intencjami start-upu. Ponadto badanie to wykazało, że efekt seryjnej mediacji subiektywnych norm na intencje rozpoczęcia działalności poprzez poczucie własnej skuteczności i postawę przedsiębiorczą był negatywnie moderowany przez edukację w zakresie przedsiębiorczości.* ***IMPLIKACJE:*** *Wyniki tego badania dodatkowo wyjaśniają związek między subiektywnymi normami a intencjami przedsiębiorczymi oraz rolą edukacji w zakresie przedsiębiorczości, przyczyniając się w ten sposób do zmniejszenia zauważalnej luki między tym związkiem. Poza tym nasze badanie dostarcza kilku implikacji dla rządów i decydentów politycznych, aby promować zamiar założenia firmy. Wyniki naszego badania wskazują, że subiektywne normy są ważnym czynnikiem w promowaniu intencji przedsiębiorczych. Dlatego decydenci powinni podjąć pewne działania promujące kulturę przedsiębiorczości, takie jak wzmocnienie działań propagandowych w celu promowania wizerunku odnoszących sukcesy przedsiębiorców, chwalenie firm i przedsiębiorców, którzy wnoszą wkład w społeczeństwo oraz dawanie dowodów ich wkładu w rozwój kraju. Promowanie kultury przedsiębiorczości może zwiększyć presję grupy rówieśniczej na potencjalnych przedsiębiorców, wzmacniając w ten sposób zamiar założenia firmy.* ***ORYGINALNOŚĆ I WARTOŚĆ:*** *Niniejsze badanie ma przyczynić się do lepszego zrozumienia mechanizmu wpływu norm subiektywnych na intencje przedsiębiorcze i wyjaśnić rolę edukacji w zakresie przedsiębiorczości w tym związku. Niniejsze badanie bada mediacyjną rolę poczucia własnej skuteczności i postawy przedsiębiorczej w związku między normami subiektywnymi a zamiarem założenia firmy. Ponadto badanie pokazuje, że edukacja w zakresie przedsiębiorczości osłabia model seryjnej mediacji subiektywnych norm dotyczących zamiaru założenia firmy.*

Słowa kluczowe: *norma subiektywna, poczucie własnej skuteczności przedsiębiorczej, postawa wobec przedsiębiorczości, intencja przedsiębiorcza, edukacja przedsiębiorcza, teoria planowanych zachowań, teoria poczucia własnej skuteczności, moderowany model mediacji seryjnej*

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Conflicts of interest

The authors declare no conflict of interest.

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An overview of the empirical research on entrepreneurial alertness using a systematic literature review method

Héctor Montiel-Campos[1]

Abstract

PURPOSE: *In the last two decades, the concept of entrepreneurial alertness (EA) has been considered a key element in investigating how individuals recognize entrepreneurial opportunities. Consequently, research on entrepreneurial alertness has grown considerably, attracting researchers' attention from not only the field of entrepreneurship, but also other academic disciplines through which this concept has been studied from a variety of perspectives. Therefore, it is time to document researchers' cumulative knowledge on entrepreneurial alertness. The present study aims to provide a comprehensive qualitative review and evaluation of the empirical entrepreneurial alertness research.* ***METHODOLOGY:*** *Based on a multi-step approach used in previous studies, which guarantees a systematic, transparent, and replicable literature review, this study identified a final sample of 84 articles published in scientific journals between 2005 and 2021 that empirically tested the concept of EA. The publications were sourced from the Web of Science database. Their analysis involved the evolution of published articles, the journals that have published the most articles, the countries where the research was undertaken, the measurement scales that have been used, and the research models in which entrepreneurial alertness has been hypothesized and examined through empirical research.* ***FINDINGS:*** *The results show that empirical research on entrepreneurial alertness grew significantly from 2016 to 2021, during which period almost 11 articles per year were published. Seven of the journals that published the articles contributed 28 percent of the total publications. Also, the results confirm that most of the empirical research on alertness has been carried out in developing economies, from which China stands out with 14 publications, representing 16 percent of the total. Additionally, the results confirm the growing consensus regarding the conceptualization and measurement of entrepreneurial alertness. Finally, the review resulted in the identification of five broad research models in which EA has been hypothesized and examined*

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through empirical research: antecedents, consequences, mediation, moderation, and moderated mediation. The model examining the consequences or outcomes of entrepreneurial alertness has received the most attention, with 59 articles in this context. ***IMPLICATIONS FOR THEORY AND PRACTICE:*** *The identification of concepts and the type of relationship they have with entrepreneurial alertness help evaluate the advances of empirical research as well as the areas of opportunity. In this way, future studies can strengthen research and thus advance the general knowledge of alertness. The most studied topics are also a reflection of the contribution of entrepreneurial alertness toward practice, both at the individual and organizational levels. In addition, researchers interested in entrepreneurial alertness are encouraged to consider the progress made in the measurement of this aspect, which offers alternatives for investigation.* ***ORIGINALITY AND VALUE:*** *Based on the review of the literature, this study organizes the empirical research of entrepreneurial alertness in different research models, which provide important insights into its process. Moreover, this study uncovers potential areas to be addressed and thereby contributes to the study of entrepreneurial alertness.*

Keywords: *entrepreneurial alertness, systematic literature review, entrepreneurial opportunity, research models, opportunity recognition, alertness, entrepreneurship*

INTRODUCTION

Among the various areas of research in the field of entrepreneurship, entrepreneurial opportunity recognition has become a key topic in the contemporary entrepreneurship literature, because it is considered as a critical first step in the entrepreneurial process (Ardichvili, Cardozo, & Ray, 2003; Eckhardt & Shane 2003; George et al., 2016; Short, Ketchen, Shook, & Ireland, 2010). At the same time, significant entrepreneurship frameworks have considered the importance of individuals' ability to recognize opportunities (e.g., Shane & Venkataraman, 2000; Gaglio & Katz, 2001; Hsieh, Nickerson, & Zenger, 2007). Despite this focus, most research about opportunity recognition has been fragmented and empirically underdeveloped (George et al., 2016). A stream of research has examined the concept of entrepreneurial alertness (EA), which has shown to be more promising as it is recognized as one of the key components determining opportunity recognition (Ardichvili et al., 2003; Zhu, Tang & Murphy, 2009). In the last decade, EA has not only stood out in the opportunity recognition literature in the field of entrepreneurship, but has also aroused great interest in other academic disciplines (Chavoushi et al., 2021; Daniel, Adeel, & Botelho, 2021).

EA is seen as a state or quality of the individuals, defined in terms of several behavioral dimensions (Sharma, 2019). Although EA has a conceptual variability, an apparent consensus arises that EA refers to an individual's ability to see opportunities that have not been discovered in the market (Gaglio

& Katz, 2001). Another point of convergence is that alert individuals have a greater capability to sense and anticipate entrepreneurial opportunities associated with their current and futures states in the market than do others, so such alertness requires a creative act, which may influence the further development and improvement of the entrepreneurial opportunity (Kirzner, 2009). Prior research has related EA to variables of nature that differ from entrepreneurship in an effort to understand more clearly its contribution to opportunity recognition. This study carries out a literature review on EA in order to create an overview of the ways in which its relationships with other variables are hypothesized in previous research.

Literature review studies help to evaluate and reflect on existing knowledge in a specific area (Popay et al., 2006). Previous studies of this nature have already shown significant advances in the study of EA by identifying its central components (Sharma, 2019), its integration with psychological theories (Chavoushi et al., 2021), and the conceptual approaches that have sustained the research of this concept (Daniel et al., 2021). The purpose of this study is not to offer an extensive interpretation of previous studies on elements of EA, but to identify the research models applied and the directions that this research has taken using a rigorous and transparent methodology.

In order to contribute to the development of EA knowledge and assist the research in identifying gaps and study opportunities, this study analyzes a sample of articles to identify the relationships that have been examined through empirical research. This analysis uses a well-established procedure to shortlist articles so that this study can be replicated in a constructive way (Hammersley, 2001). Unlike bibliometric or meta-analytic research, which applies minimum sample size requirements, this study identifies and discusses a more comprehensive set of variables explored as antecedents, consequences, mediators, moderators, or a combination of these elements.

In summary, the present study aims to provide an overview of empirical literature on the EA concept. It focuses specifically on studies testing hypothesized relationships because these kind of studies have helped evaluate and test the core tenets of EA. Consequently, by reviewing the empirical EA literature, this study contributes insights about topics that have attracted the attention of scholars and at the same time provides recommendations for future studies.

This article proceeds as follows. The next section provides a brief theoretical background of the EA concept. Then, the method used to select the empirical studies for analysis is explained. Next, it reports the results and discusses their implications. Finally, the article offers a conclusion with some final considerations of the study.

THEORETICAL BACKGROUND

The seminal works of Knight (1921), Hayek (1945), and Mises (1949) illuminated the uncertain environment that entrepreneurs faced and the difficulty of perceiving and exploiting contingencies, thus requiring special talent to interpret market events. However, the works of Kirzner (1973, 1979, 1985), who took advantage of this foundation, was first to make this special talent known as EA. Through his theory, Kirzner introduced the concept of EA, which was considered as an ability that helps some individuals be more aware of changes, shifts, opportunities, and overlooked possibilities due to market changes (Kirzner, 1973, 1979).

According to Kirzner, EA refers to "the ability to notice without search opportunities that have hitherto been overlooked" (Kirzner, 1979, p. 48), "a motivated propensity of man to formulate an image of the future" (Kirzner, 1985, p. 56), or "an attitude of receptiveness to available, but hitherto overlooked, opportunities" (Kirzner, 1997, p. 72). More recently, Kirzner (2009) argued that recognition requires the momentary perception of the opportunity, whereas exploitation requires an individual to effectively and creatively steward the process of EA into exploitation. In this perspective, Valliere (2013) commented that EA is presented as conceptually different from the subsequent development of the opportunity and from the activities that correspond to its exploitation. Therefore, EA has been conceived more as a state of mind, which is open to opportunities at all times (Busenitz, 1996).

Building upon Kirzner's theoretical contributions, other authors continued to make significant contributions that strengthened the EA concept. For example, Kaish and Gilad (1991) saw alert individuals as having a "unique preparedness" in consistently scanning the environment to recognize opportunities within a complex flow of information. Later, and with a different focus, Gaglio and Katz (2001) invoked schema theory to explain that EA is a distinctive set of perceptual and information-processing skills. For these authors, alert individuals, prompted by a schema emphasizing objectivity, recognize the changing environmental conditions and consequently reassess the situation. In addition to schema theory, Valliere (2013) also considered decision theory to suggest that EA is the application of unique schemata that allow the individual to attribute meaning to environmental change that would not be attributed by other individuals.

Baron (2006) used what he called pattern recognition to describe EA. According to Baron, what makes individuals alert is their cognitive ability to recognize that one situation is similar to another in some meaningful way and that, from this recognition, opportunity emerges. Hence, EA helps individuals "identify new solutions to market and customer needs in existing

information, and to image new products and services that do not currently exist" (Baron & Ensley, 2006, p. 1331). In this order of ideas, opportunity recognition is more a spontaneous result derived from EA, than the result of a deliberate search (Tang, 2009), which suggests that opportunities can be recognized even when they are not actively sought (Baron, 2006).

Using a different approach, Minniti (2004) argued that more alert individuals have higher probabilities of exhibiting entrepreneurial behavior, which strengthened the proposal to consider EA as a process that typically involves personal initiative (Ardichvili et al., 2003; Tang, Kacmar & Busenitz, 2012). According to McMullen and Shepherd (2006), alertness is not entrepreneurial unless it involves judgment and a movement toward action. Therefore, EA was widely seen as a key ability not only for entrepreneurial thinking, but also for entrepreneurial behavior, an assumption supported by a growing body of research. More recently, Tang et al. (2012, p. 78), argued that "alertness is a concept that has the potential to add substantially to our understanding of how new ideas get initiated and pursued." They proposed that EA has three behavioral components: a proclivity to scan and search for new information, an ability to connect disparate information, and an inclination to evaluate whether a new piece of information represents an opportunity.

Initial insights from Kirzner (1973, 1979, 1985) positioned EA as a key component of an increasingly dynamic and competitive entrepreneurial process. After individuals seize an opportunity, they carry out entrepreneurial activities, and the individual's capabilities are formed through these activities. Alertness to opportunities, therefore, is one of the first steps in the entrepreneurial process (Shane & Venkataraman, 2000; Short et al., 2010). However, the scope and importance of EA are not limited within an entrepreneurial process alone, as EA was originally conceptualized as a characteristic that can manifest in broad areas of human decision-making (Kirzner, 1973). For example, from an organizational behavior perspective, previous studies have found that EA differs between entrepreneurs and managers when they must respond to changes in the market (e.g., Kaish & Gilad, 1991; Busenitz, 1996; Busenitz & Barney, 1997; Allinson, Chell, & Hayes, 2000). Similarly, more recent studies have advanced the argument that EA has effects or consequences at the organizational level too, such as entrepreneurial orientation or corporate entrepreneurship (e.g., Lee, Kim & Koh, 2016; Urban, 2017), innovation (e.g., Jiao, Cui, Zhu, & Chen, 2014; Tang et al., 2012) and firm performance (e.g., Amato, Baron, Barbieri, Bélanger, & Pierro, 2017; Adomako, Danso, Boso, & Narteh, 2018).

Based on a systematic literature review, Sharma (2019) summarized the different approaches that have increased understanding of EA as well as its core components, namely sensing and searching information, cognitive

ability, personality factors (like creativity and self-efficacy), environment, social networks, knowledge, and experience. From this growing interest and diversity of approaches, Chavoushi et al. (2021) confirmed that the scope of EA is not limited to opportunity recognition alone, so it has been related to other concepts.

EA can be confused with similar concepts within the entrepreneurial literature, such as entrepreneurial mindset (Asenge, Diaka & Soom, 2018), entrepreneurial awareness (Aviram, 2010), and market awareness (Bonney, Davis-Sramek & Cadotte, 2016). Unlike entrepreneurial mindset, which is considered a holistic perception of generating novel ideas, evaluating risks, or starting and running a business (Asenge et al., 2018), and entrepreneurial awareness, which is an individual's ability to evaluate a chosen opportunity (Aviram, 2010), EA refers to how new business ideas get initiated and pursued (Tang et al., 2012).

On the other hand, EA also differs from market awareness, which has foundations in the marketing literature and refers to the capability to interpret broad market information accurately without it necessarily leading to opportunity recognition (Bonney et al., 2016). Thus, by facilitating a separate understanding of a key entrepreneurial cognitive ability and how it influences an individual's behavior, EA provides an important conceptual framework through which can be explored the dynamics of the opportunity recognition process with business potential (Daniel et al., 2021).

METHOD

According to Popay et al. (2006), a literature review comprehensively selects the existent scientific knowledge in a specific field. Furthermore, its process must be transparent and replicable to decrease the bias of the researcher (Hammersley, 2001). In order to review the empirical literature on EA, this study followed the multi-step approach suggested by Newbert (2007), which is outlined below.

First, the search was restricted to scholarly journal publications, therefore book chapters and conference proceedings were not included, as they undergo a less rigorous peer review process (Wales, Gupta & Mousa, 2013).

Second, the database chosen for this study was Web of Science (WoS), which contains high quality multidisciplinary research information from more than 3,300 world-leading journals in the sciences, socials sciences, arts, and humanities (Clarivate, 2021). In addition, WoS is more demanding in terms of quality content compared to other databases (e.g., Scopus

and Google Scholar), so WoS covers a more limited range of journals and consequently has fewer articles (Adriaanse & Rensleigh, 2013).

Third, to identify the articles from the database, the terms "entreprene*" and "alert*" were used, where "*" indicates that variations on the ending of the word were permitted. It was necessary that both terms be present in at least titles, abstracts, or keywords of publications. A time period for the research was not defined, because the study sought to map all productions available in WoS through November 2021. The initial survey returned 192 articles available without restrictions for areas of knowledge.

Fourth, a reading/checking of title, abstract, and keywords of each article was carried out in order to exclude those that did not correspond with the purpose of the study (Newbert, 2007). This action excluded 57 articles that, although they might have mentioned the search terms, did not discuss the specific concept of alertness by entrepreneurs (e.g., Bonney et al., 2016; Sun, 2015).

Fifth, the next key condition for retaining an article depended on whether it was empirical and ensured the theoretical relevance of the EA construct. A deep exploratory study of the 135 remaining articles was carried out, and this action facilitated the exclusion of 31 theoretical or literature review articles (e.g., Sharma, 2019; George et al., 2016; Ardichvili et al., 2003; Gaglio & Katz, 2001; Sambamurthy, Bharadwaj & Grover, 2003; Tang et al., 2012) as well as 10 qualitative or case studies articles (e.g., Liu & Liang, 2021; Fiet, Norton, & Clouse, 2013). This screening produced 94 publications potentially relevant to the scope of this study.

Finally, the 94 articles were fully read to enhance reliability. The criteria for retaining articles were that the articles must be empirical, and at least one hypothesis in the research model was tested on the EA construct. After this step, 10 articles were excluded, because either the EA concept was not clear enough in the research model (e.g., Sambasivan, Abdul & Yusop, 2009), or the study was eminently qualitative (e.g., Arnold, 2019). In short, this study followed a six-step procedure to identify 84 articles that empirically tested the concept of EA in a research model, and the results were published in scholarly journals.

RESULTS

Overview of results

Figure 1 shows that the first empirical study in the sample was published in 2005. The period between 2005 and 2015 was a period of very little

production, in which practically one article was published per year. From 2016 to 2021, a higher level of scientific production was observed. During this period, almost 11 articles, on average, were published per year. This result is similar to that obtained by Chavoushi et al. (2021) and Daniel et al. (2021), who also identified an increase in scientific production about EA from 2013.

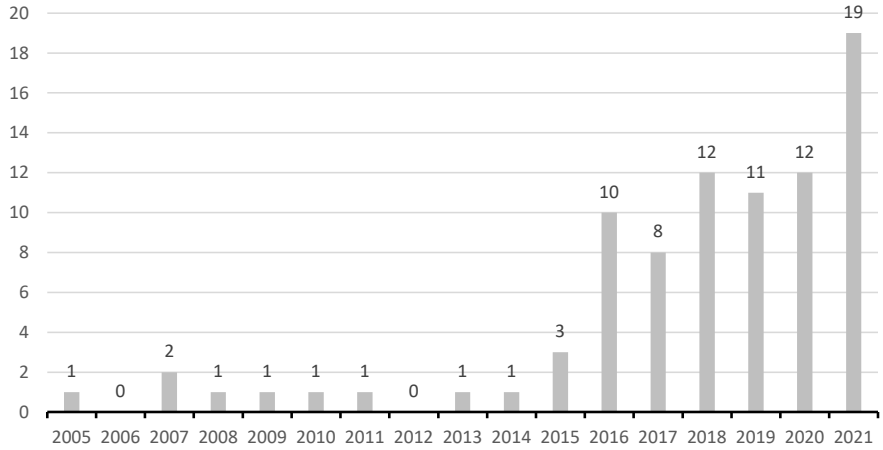


Figure 1. Number of publications per year (2005-2021)

Regarding the journals that published articles on EA, the 84 articles were published in 56 different journals. Table 1 shows the journals that published four or three articles and their respective subject areas, among which management and business were predominant. These seven journals contributed 28 percent of the publications. The journals Entrepreneurial Business and Economics Review, Frontiers in Psychology, Journal of Business Venturing, Journal of Developmental Entrepreneurship, Journal of Small Business and Enterprise Development, Journal of Vocational Behavior, Management Decision, and Technology Analysis & Strategic Management published two articles each. Each of the remaining articles were published in different journals.

Regarding the focal country of the research, 77 articles involved a single country, while in 7 articles, at least two countries participated (Table 2). China was the country with the highest percentage of publications (16 percent), followed by Iran (9 percent) and the United States and South Africa (8 percent each). Table 2 shows the scientific production organized according to the scheme of cultural clusters of the GLOBE study (Wales et al., 2013). The Confucian cultural cluster was the most productive with 22 articles, followed by the African with 13 and the South-East Asian with 12.

Table 1. Journals that most published on entrepreneurial alertness

Scientific journals	Subject area	Articles
International Entrepreneurship and Management Journal	Business and management	4
Journal of Small Business Management	Management	4
	Business, economics, and management	
Social Behavior and Personality	Psychology	4
International Journal of Entrepreneurial Behavior & Research	Business and management	3
International Small Business Journal	Business and management	3
Journal of Business Research	Business	3
Sustainability	Environmental sciences, environmental studies, and green & sustainable science & technology	3

Table 2. Production of scientific articles on entrepreneurial alertness by country

Cultural Cluster	Country	Articles
African (13)	Ghana	2
	Nigeria	3
	South Africa	7
	Uganda	1
Anglo-Saxon (7)	USA	7
Confucian (22)	China	14
	South Korea	2
	Singapore	1
	Taiwan	5
Eastern European (3)	Croatia	1
	Slovenia	1
	Ukraine	1
German (1)	Germany	1
Latin-American (6)	Mexico	6
Latin-European (8)	France	2
	Italy	4
	Romania	1
	Spain	1
Middle Eastern (2)	Tunisia	1

Cultural Cluster	Country	Articles
	United Arab Emirates	1
Nordic (3)	Finland	1
	Sweden	2
South-East Asian (12)	Iran	8
	India	1
	Pakistan	3
Multinational (7)		7

Measurement of entrepreneurial alertness

An important aspect in research on EA is its measurement. Among the first authors to comment on and experience these challenges were Kaish and Gilad (1991) and Busenitz (1996). According to these authors, progress in EA research depended on having a sufficiently reliable measurement scale for the scientific community to adopt and consequently accumulate knowledge. As seen in Table 3, the measurement scale developed by Tang et al. (2012) was used in 56 articles, which represented 67 percent.

The scale created by Tang et al. (2012) is made up of three dimensions. The first is called scanning and search, which reflects the first interpretations that the individuals make of their environment as well as the first search for information. Six items are used to evaluate this dimension. One example is, "I have frequent interactions with others to acquire new information." The second dimension, association and connection, refers to the fact that individuals put their creativity into practice to identify patterns in a new order of things, for which it is necessary to adapt their knowledge schemes. An example of the three items that measure this dimension is, "I see links between seemingly unrelated pieces of information." Lastly, the evaluation and judgment dimension is measured on a four-item scale, and it refers to the discernment that the individuals make of the business opportunity in order to decide whether or not it is worth continuing to work on it. A sample items is "When facing multiple opportunities, I am able to select the good ones."

Table 3. Entrepreneurial alertness construct measures

Research sources	Article count
Tang *et al*. (2012) - Aggregated (SS + AC + EJ) [a]	39
Tang *et al*. (2012) - Multidimensional (SS, AC, EJ) [a]	13
Tang *et al*. (2012) - Unidimensional (SS) [a]	4
Global Entrepreneurship Monitor	5

Research sources	Article count
Miao (2006)	4
Sambamurthy *et al*. (2003)	3
Kaish and Gilad (1991)	2
Other	14

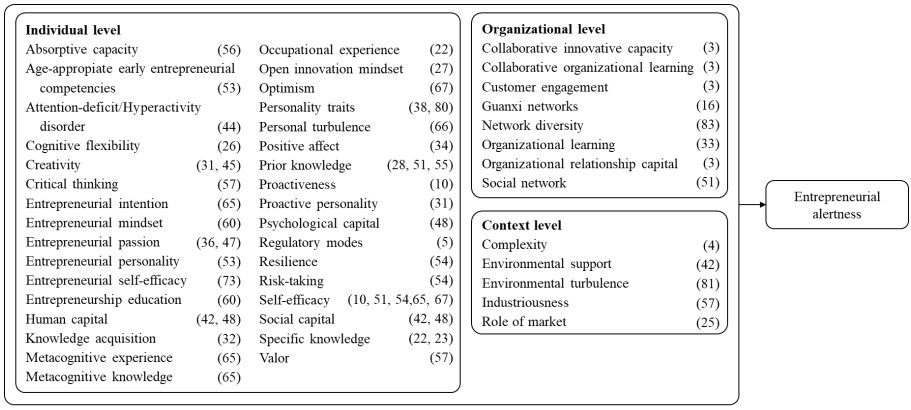
Note: SS = Scanning and search dimension; AC = Association and connection dimension; EJ = Evaluation and judgment dimension. [a] Of the sample of 84 articles, 39 articles examined entrepreneurial alertness combining the three dimensions (aggregated), 13 examined the dimensions separately (multidimensional), and 4 examined only one dimension (unidimensional).

The three distinct elements that comprise Tang et al.'s (2012) measurement proposal showed their versatility to be used according to the objectives of each investigation. Table 3 shows that 39 articles required an aggregate EA score, so they combined the 13 items of the three dimensions to obtain an overall score (e.g., Gill, Bencheva, Karayel & Usman, 2021; Urban & Msimango-Galawe, 2020). Thirteen articles used a multidimensional assessment; that is, these studies wanted to know the behavior of each dimension of EA, so they were separately evaluated (e.g., Edigbo, Ogbo, Onwe, Igwe & Okafor, 2021; Liang, 2019). Finally, four articles focused on only one dimension, specifically scanning and search, since they considered it to be the trigger for the process of identifying opportunities (e.g., Sassetti, Cavaliere & Lombardi, 2022).

Other measurement proposals were presented, such as the Global Entrepreneurship Monitor (GEM), which is based on knowing the expectation of others regarding the existence of a business opportunity. The GEM measures EA with a single item (Reynolds et al., 2005). Specifically, respondents are asked, "In the next six months, will there be good opportunities for starting a business in the area where you live?" This proposal, as seen in Table 3, was used in five articles (e.g., Zhao, Li, Li, & Schott, 2020; Boudreaux, Nikolaev & Klein, 2019). Similarly, the scale developed by Miao (2006) was used in four studies (e.g., Sang & Lin, 2019; Li, Wang & Liang, 2015). It contains seven items, which considers aspects such as sensitive foresight, explorative prospecting, and redefining framework. A sample item of this scale is "I will gain new business information through my social network."

Table 3 also shows that three studies used Sambamurthy, Bharadwaj, and Grover's (2003) proposal (e.g., Tsou & Cheng, 2018; Agarwal & Selen, 2009). This scale contains four items, including two factors: strategic foresight and systematic insight. A representative item is "Working in partnership gives us an ability to anticipate discontinuities arising in the future." The Kaish and Gilad (1991) measurement scale was also used, although only in two studies (e.g., Biswas & Verma, 2021; Fiet, Norton & Clouse, 2007). This scale reflects the dedication to remain updated with respect to trade related information,

propensity to reflect on innovative business ideas, and the skills to identify them. An example of the five items that make up this scale is "I think about delivered lectures and practical sessions in my free time to grab on the market opportunities." Lastly, a group of 14 articles (e.g., Roundy, Harrison, Khavul, Pérez-Nordtvedt, & McGee, 2018; Cui, Sun, Xiao, & Zhao, 2016) developed their own measurement scales based on significant previous work such as Busenitz (1996), Kaish and Gilad (1991), and Kirzner (1973, 1979, 1985).



Note: The numbers in parentheses indicate the article in which the variable was tested in a hypothesis. The articles are numbered in the appendix.

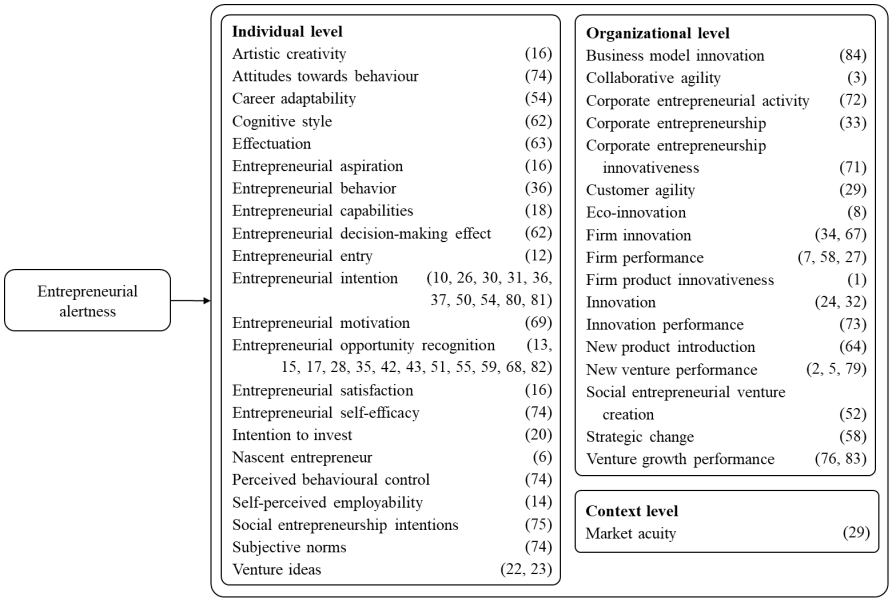
Figure 2. Antecedents in prior research on EA

Antecedents of entrepreneurial alertness

The results show that a research stream on EA has been focused on knowing its antecedents, that is, the aspects that contribute to a greater manifestation of alertness in individuals. In general, as can be seen in Figure 2, the results show a diversity of variables, of which the abilities or capacities at the individual level are the ones that have most attracted the attention of the researchers. For example, a group of studies explored the influence of self-efficacy on EA (e.g., Biswas & Verma, 2021; Stanic, 2020). Similarly, some variants of knowledge, such as prior knowledge (e.g., Roundy et al., 2018), metacognitive knowledge (Stanic, 2020), or specific knowledge (e.g., Fiet & Patel, 2008), have also attracted the attention of researchers.

At the organizational level, the study developed by Agarwal and Selen (2009) stands out, as it studied the influence of collaborative innovative capacity, collaborative organizational learning, customer engagement, and organizational relationship capital on EA. Finally, a few studies investigated the influence of context on EA. For example, Aimar, Bouhdaoiu, Mateu

and Sutan (2020) analyzed its complexity, while Pirhadi, Soleimanof and Feyzbakhsh (2021) explored its industriousness.



Note: The numbers in parentheses indicate the article in which the variable was tested in a hypothesis. The articles are numbered

Figure 3. Consequences in prior research on EA

Consequences of entrepreneurial alertness

Tang et al. (2012) argued the importance of knowing the outcomes of EA. As Figure 3 shows, the outcomes or consequences of EA have been predominantly analyzed at the individual level, but there is a considerable group of studies at the organizational level. Among the dependent variables at the individual level that have most caught the attention of researchers are entrepreneurial intention and entrepreneurial opportunity recognition, which represent 50 percent of the studies. For example, Neneh (2019) and Li et al. (2020) stated that individuals that are alert to entrepreneurial opportunities will be more inclined to have a high level of entrepreneurial intention. In a similar way, a large group of studies has looked at what appears to be a natural relationship between EA and opportunity (e.g., Tominc & Rebernik, 2007; Hajizadeh & Zali, 2016). Accordingly, this group of studies predicts that individuals' EA can influence their ability to recognize entrepreneurial opportunities.

Regarding the consequences of EA at the organizational level, several studies have established the influence of EA with different manifestations

of innovation; for example business model innovation (Zhao, Yang, Hughes & Li, 2021), firm product innovativeness (Adomako, 2021), and corporate entrepreneurship innovativeness (Urban, 2017).

Similarly, researchers have been interested in the influence of EA on different kinds of performance; for example, firm performance (e.g., Roundy et al., 2018), new venture performance (e.g., Xie & Lv, 2016), and venture growth performance (e.g., Urban & Msimango-Galawe, 2020). Finally, only one study considered the influence of EA at context level. In this study, Hosseini, Khoddami, Moshabaki and Azar (2011) said that managers' EA increases their visibility of opportunities and choice of feasible opportunities. Hence, EA has a positive effect on market acuity.

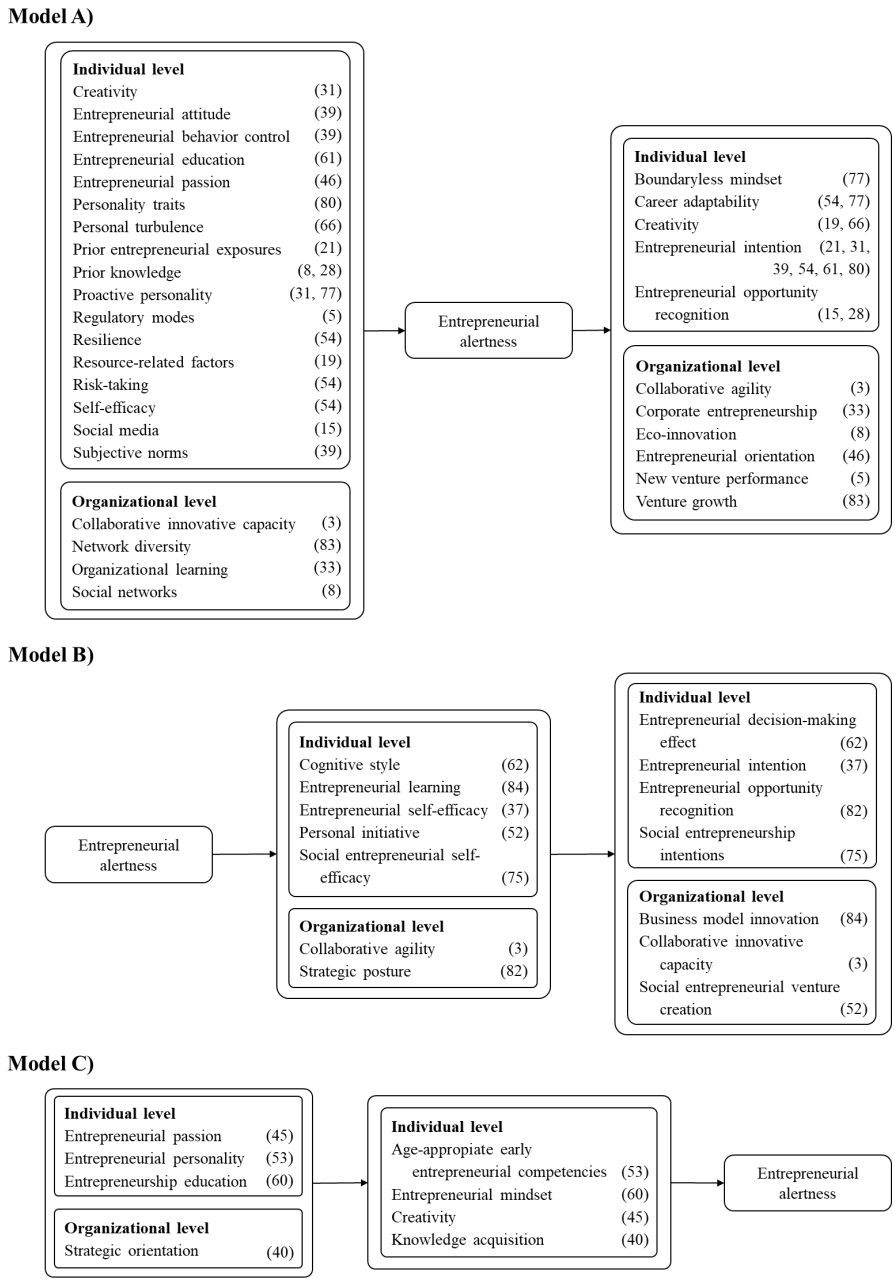
Entrepreneurial alertness in mediation models

According to MacKinnon, Fairchild, and Fritz (2007), the mediation models help unravel the causal chain between two related variables. In other words, a mediation analysis acknowledges the need to elucidate the causal process by decomposing the relationship into its constituent parts (Baron & Kenny, 1986). Figure 4 shows that researchers have been interested in three different mediation models.

The studies included in Model A of Figure 4 have declared EA as the moderating variable in a hypothesis. For example, Tang (2016) proposed that EA mediates the relationship between entrepreneurs' turbulence (negative and positive) and their creativity. Similarly, Hu, Wang, Zhang, and Bin (2018) suggested that creativity and proactive personality influence students' EA, which positively affects entrepreneurial intention.

Unlike the studies included in Model A, the EA in Model B plays a different role. The studies in this model show that EA leads to a mediating variable that then leads to outcomes. For example, Liang and Chen (2021) established that EA indirectly influences entrepreneurial intention through the mediation of entrepreneurial self-efficacy. In this sense, Zhao et al. (2021) proposed that entrepreneurial learning mediates the relationship between EA and business model innovation.

Finally, the four studies of Model C show the chain of influence that other variables have on EA. That is, the EA is the outcome. For example, Saadat, Aliakbari, Majd and Bell (2021) proposed that entrepreneurship education with the mediating role of entrepreneurial mindset influences EA. In a combination of variables at the individual and organizational levels, Ma and Huang (2016) posited that knowledge acquisition mediates the relationship between strategic orientation and EA.

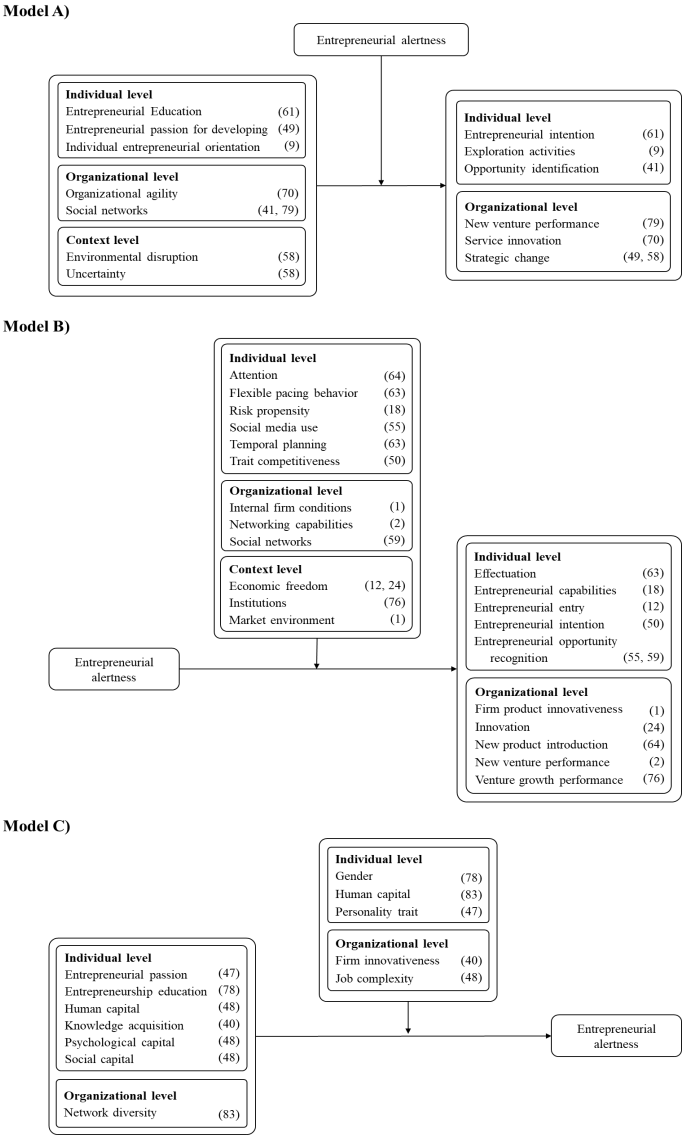


Note: The numbers in parentheses indicate the article in which the variable was tested in a hypothesis. The articles are numbered in the appendix.

Figure 4. Mediation models in prior research on EA

Entrepreneurial alertness in moderation models

According to James and Brett (1984), a variable is a moderator when it influences the relationship between other two variables.



Note: The numbers in parentheses indicate the article in which the variable was tested in a hypothesis. The articles are numbered in the appendix.

Figure 5. Moderation models in prior research on EA

Baron and Kenny (1986) stated that, in a moderation analysis, statistically there is no difference when analyzing the joint effect of the moderating variable and independent variable on the dependent variable. In other words, statistically, there is no difference if EA is the moderator or the independent variable, since the joint effect is the same. However, there is a difference in how the variables are related theoretically, which is established in the hypotheses. Figure 5 summarizes the moderation models in which EA has been examined in prior research.

In Model A of Figure 5, EA is considered a moderating variable, that is, the relationship between two variables is a function of the level of EA. For example, Xie and Lv (2016) hypothesized that female tech-entrepreneurs' EA positively moderates the relationship between social networks and new venture performance. On the other hand, Roundy et al. (2018) suggested that EA positively moderates the negative relationship between perceptions of uncertainty and the magnitude of strategic change decisions. The studies in Model B show that the influence of EA on the outcome depends on the intensity of another moderating variable. In this line of reasoning, Adomako (2021) suggested that the positive effect of EA on firm product innovativeness becomes more positive when the market environment is greater. Another example is the study by Cui et al. (2016), who proposed that EA has a greater effect on the entrepreneurial capabilities of an entrepreneur with a higher level of risk propensity.

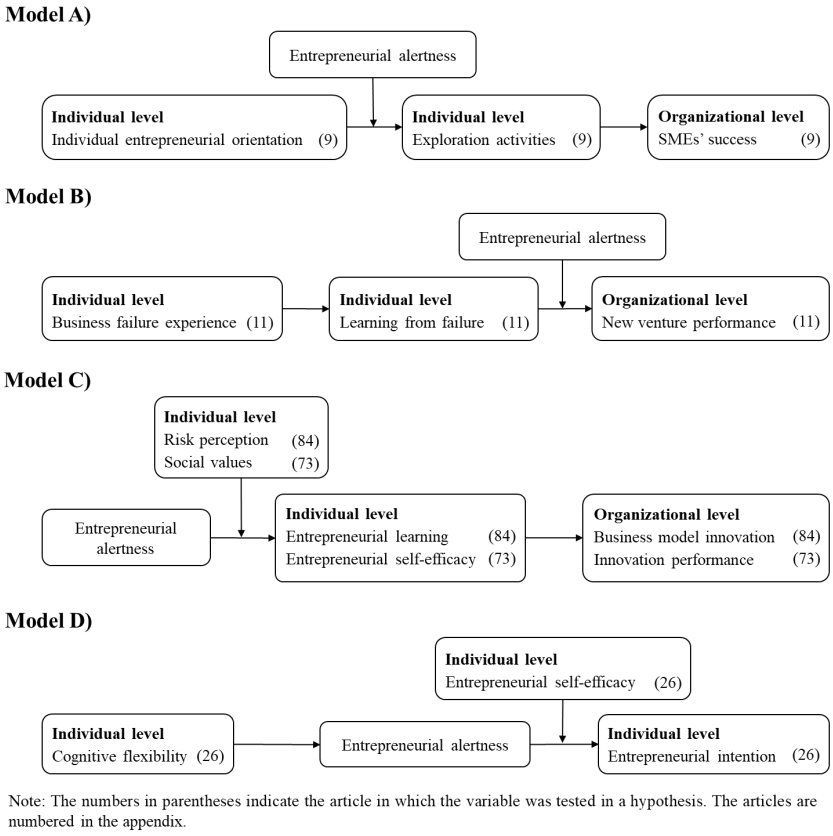
In another group of studies, the EA can be identified as the dependent variable (Model C of Figure 5). In these studies, the interaction of two variables is what leads to EA as an outcome. Zhao et al. (2020), for example, proposed that the positive effects of network diversity on EA diminish with the increase of some elements of human capital. Similarly, Montiel-Campos (2019) established that the positive relationship between female middle managers' human capital and EA is moderated by job complexity.

Entrepreneurial alertness in moderated mediation models

Five studies have examined the role of EA in moderated mediation models, whose objective of this kind of study is to identify indirect conditional effects (Hayes, 2013). The five studies can be organized into four different models, as can be seen in Figure 6. Models A and B show EA in a moderating variable role. For example, Bilal and Fatima (2021) posited that EA strengthens the indirect relationship of individual entrepreneurial orientation and SMEs' success mediated by exploration activities. In a similar way, Boso, Adeleye, Donbesuur and Gyensare (2019) proposed that, with a greater ability to learn

from business failure and with a stronger EA, an entrepreneur is more likely to develop a new venture.

The role of EA in Model C is no longer a moderator, but rather part of the chain of sequences. For example, Zhao et al. (2021) stated that entrepreneurs with different risk perceptions tend to achieve business model innovation through different types of learning. Finally, the only study in Model C assumed that entrepreneurial self-efficacy moderates the mediated relationship between cognitive flexibility and entrepreneurial intentions by EA (Gill et al., 2021). This group of studies represents a more sophisticated relationship between EA and other variables. Therefore, these studies, although in smaller quantity than the studies presented in the other models (i.e., antecedents, consequences, mediation, and moderation), also make a significant contribution to the study of EA.



Note: The numbers in parentheses indicate the article in which the variable was tested in a hypothesis. The articles are numbered in the appendix.

Figure 6. Moderated mediation models in prior research on EA

DISCUSSION

Descriptive analysis and directions

Although the first article identified in the sample of this study is from the year 2005, this does not mean that there are no previous empirical studies. The studies of Kaish and Gilad (1991) and Busenitz (1996) are examples of earlier articles; however, they were not included in the sample because in the year of publication, their journals were not yet members of the WoS database. This aspect is also latent in the first years of the period analyzed, since scientific production was scarce. However, the findings show a sharp increase in the number of publications from 2016. A possible explanation of this can be found in the comments of Gaglio and Katz (2001), who argued that, to the extent that the initial problems in the study of EA were overcome, the research would be more productive. Then, it seems that EA has shown to be a useful construct through which a wide range of phenomena related to topics beyond opportunity recognition can be examined.

Additionally, the interest in studying EA was accompanied by a variety of journals, not only focused on entrepreneurship or business areas, but also on other subject areas. According to Baskerville (2003), as theoretical constructs are used in areas in which they fulfill particular needs, the increase in articles empirically exploring EA in non-entrepreneurship-focused journals indicates broad acceptance and application within the scholarly community. In other words, this construct is gaining acceptance in outlets with broad managerial scope, suggesting that it is not emerging as a parochial construct, but of interest to a wide audience (Wales et al., 2013).

The growing interest in EA has motivated researchers to examine its core tenets in different cultural contexts. The findings show that the majority of empirical research has been conducted in developing and emerging market contexts, in which China has received the most attention in the EA literature. On the other hand, with the exception of the United States, developed economies represent an opportunity to promote research on EA.

Research implications and directions

Although varying measurement proposals of EA have been suggested, it appears that knowledge accumulated around the conceptualization has already begun. Roughly 47 per cent of the empirical studies adopted the aggregated approach by Tang et al. (2012), suggesting strong convergence toward this approach. Furthermore, research adopting the multidimensional or unidimensional approach by Tang et al. (2012) has been increasing since

2016, which means that opportunities exist for a better understanding of the influence of each dimension of EA. Definitely, future research should consider these three approaches without neglecting that the choice should be driven by the research question being investigated.

Regarding antecedents of EA, Kirzner (1997) suggested the need to know the factors that trigger or motivate it. The findings show that variables at individual levels dominated the studies that located EA as the dependent variable (see Figure 2). Despite EA's strong cognitive component, the findings reveal that an important part of this research has barely begun to be focused on these components, without neglecting that variables at the organizational level have aroused the interest of researchers. Future research could contribute by adopting a small set of variables emanating from a well-developed theoretical framework that helps predict EA.

Following Tang et al. (2012), who suggested exploring the variables influenced by EA, the findings show that their suggestion has enriched the study of EA. The results show that both individual- and organizational-level variables have been frequently studied. However, the most popular variables that have been studied as a consequence of EA are entrepreneurial skills or abilities at the individual level, such as entrepreneurial intention and entrepreneurial opportunity recognition. As Figure 3 presents, EA has also been shown to influence behaviors at the organizational level, at which the issues of innovation and performance are the ones that have attracted the most attention. In essence, the literature that analyzes the consequences of EA confirms that it can be associated with different aspects of the operation of a firm, which opens up a variety of future lines of research at the organizational level.

The progress made in studying the antecedents and consequences of EA may have encouraged researchers to examine causal processes in which EA was involved (see Figure 4). In this sense, previous studies were interested in knowing how EA contributed to specific outcomes. Curiously, little attention has been paid to mediation models in which the outcome is the recognition of opportunities, which is an important part of entrepreneurship (George et al., 2016).

Although previous EA research has investigated mediation models of variables at both the individual and organizational levels, relating the variables in a causal process without understanding their underlying generative mechanisms will not help to better understand the relationship among them. Therefore, future research could benefit from analyzing more specifically the components of the main variables in mediation relationships. Hence, the multidimensional approach of EA can make interesting contributions.

The growing interest in EA motivated researchers to examine contingent relationships. According to Donaldson (2001), contingent approaches help to better understand the influence of organizational aspects on the dependent variable; however, the results show that variables at the organizational level did not predominate (see Figure 5). In addition, three types of moderation between the predictor and the moderating variables were identified in the studies reviewed. Future studies could focus their research models according to the classification by Frazier, Tix and Barron (2004), who identified enhancing relationships, antagonistic relationships, and buffering relationships. This proposal could help to compare results among studies and to know the relative influence that some variables have on the dependent variable, which could be at the organizational or contextual level.

Finally, the study of the relationship between EA and other variables has become increasingly complex, which is evident in the moderate mediation models (Figure 6). The five articles identified in this study appeared in the last three years of the analyzed period (2019-2021). This may indicate the beginning of a new stage in the study of EA; however, the same risks as with contingent models may arise. An interesting contribution of future research is that results can be compared between the same research designs. This would help to identify the most favorable position of EA in these models. So far, as Figure 6 shows, four different positions have been identified.

CONCLUSION

The aim of this study was to conduct a qualitative review of the empirical EA literature. In response, a sample of EA-grounded empirical articles was analyzed in order to provide a summary of the prior research areas. The results showed that the growing interest in this topic in the last decade is not limited to the field of entrepreneurship, but has attracted the attention of researchers from different fields of research. As a consequence, three main contributions to the empirical research on EA can be derived from this study.

First, this study confirms the prevalence and breadth of the empirical research on EA by identifying the articles performed on the subject over time and by grouping them according to the scope of the publishing journal and the focal country of the research. This study identifies that the subject area of some journals that have been published on EA is not business and management related (e.g., general psychology, environment, education) and that most research has been carried out in less developed countries. Second, this study helps to make sense of the diversity of the variables that have been connected to EA, thus overcoming one of the drawbacks of

individual studies that consider a reduced number of variables to examine this concept. This study proposed five distinct classifications to characterize the empirical research resulting from almost two decades of research in EA. Third, the growing interest in EA has evolved from a diversity of approaches (Sharma, 2019), which has motivated debate about its conceptualization and measurement (e.g., McCaffrey, 2013). This study sheds light on the growing popularity of the proposal by Tang et al. (2012), which can help to overcome these problems.

It is important to note that the suggestions presented in the discussion section in response to the findings are intended to be neither exhaustive nor absolute; rather, this study seeks to create awareness about past research on EA and to encourage future empirical studies on this topic. The present paper has highlighted several fruitful areas of research and pointed out important aspects that researchers should consider when conducting EA research. The results show that EA studies are not only interested in knowing about its antecedents and consequences, but interest has also arisen in knowing how it behaves in causal processes and contingent relationships. Undoubtedly, these research models improve the knowledge about EA, but they also represent a research stream that requires further study on this type of relationships.

As practical implications, the results show that EA not only contributes at the individual level, but also at the organizational level, especially when it stimulates the development of innovation and its impact on performance. Managers can take advantage of these findings and provide an organizational environment that not only encourages but also recognizes the practice of EA by employees. One limitation of the study is that it is only based on the WoS database. It is recommended that future research include other databases. Finally, the results of this study could stimulate further productive new directions in terms of future research.

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Appendix. Summary of articles in the sample by author/year/journal

*Adomako (2021) International Journal of Innovation Management	(1)
Adomako et al. (2018) International Small Business Journal	(2)
*Agarwal and Selen (2009) Decision Sciences	(3)
*Aimar et al. (2020) Strategic Change	(4)
Amato et al. (2017) Journal of Small Business Management	(5)
Arenius and Minniti (2005) Small Business Economics	(6)
Asenge et al. (2018) International Journal of Innovation	(7)
Ben Amara et al. (2020) Business Strategy and Development	(8)
*Bilal and Fatima (2021) Journal of Entrepreneurship in Emerging Economies	(9)
*Biswas and Verma (2021) Journal of Entrepreneurship	(10)
*Boso et al. (2019) Journal of Business Research	(11)
*Boudreaux et al. (2019) Journal of Business Venturing	(12)
Boumedjaoud and Messeghem (2020) Revue Internationale PME	(13)
Cavaliere et al. (2021) Personnel Review	(14)
Ceptureanu et al. (2020) Entropy	(15)
Chen and Tseng (2021) International Journal of Entrepreneurial Behavior & Research	(16)
Chen et al. (2020) Technology Analysis & Strategic Management	(17)
*Cui et al. (2016) Technological Forecasting and Social Change	(18)
Dayan et al. (2013) Creativity and Innovation Management	(19)
Drnovsek et al. (2018) Zbornik Radova Ekonomskog Faculteta u Rijeci	(20)
*Edigbo et al. (2021) Entrepreneurial Business and Economics Review	(21)
*Fiet and Patel (2008) Small Business Economics	(22)
Fiet et al. (2007) Journal of Engineering and Technology Management	(23)
Fuentelsaz et al. (2018) International Small Business Journal	(24)
Ghasemi and Rowshan (2016) Journal of Intelligence Studies in Business	(25)
*Gill et al. (2021) Entrepreneurial Business and Economics Review	(26)
Gomezel and Rangus (2018) Management Decision	(27)
*Hajizadeh and Zali (2016) International Journal of Entrepreneurial Behavior & Research	(28)
*Hosseini et al. (2011) African Journal of Business Management	(29)
Hu and Ye (2017) Social Behavior and Personality	(30)
Hu et al. (2018) Frontiers in Psychology	(31)
Jiao et al. (2014) Technology Analysis & Strategic Management	(32)
Lee et al. (2016) Asian Journal of Technology Innovation	(33)
Levasseur et al. (2020) Asia Pacific Journal of Management	(34)
Li et al. (2015) Social Behavior and Personality	(35)

*Li et al. (2020) Frontiers in Psychology	(36)
*Liang and Chen (2021) Asia Pacific Business Review	(37)
*Liang (2019) Journal of Entrepreneurship Management and Innovation	(38)
Lu and Wang (2018) Journal of Asian Finance Economics and Business	(39)
*Ma and Huang (2016) Journal of Small Business Management	(40)
Ma et al. (2020) Social Behavior and Personality	(41)
Mehdizadeh et al. (2021) Journal of Applied Research in Higher Education	(42)
Miao and Liu (2010) Social Behavior and Personality	(43)
Moore et al. (2021) Entrepreneurship Theory and Practice	(44)
Montiel-Campos (2016) Revista Brasileira de Gestao de Negocios	(45)
Montiel-Campos (2017) Journal of Small Business and Enterprise Development	(46)
Montiel-Campos (2018) Serbian Journal of Management	(47)
*Montiel-Campos (2019) International Journal of Gender and Entrepreneurship	(48)
Montiel-Campos (2021) Journal of Organizational Change Management	(49)
*Neneh (2019) Personality and Individual Differences	(50)
Nikraftar and Hosseini (2016) Tourism Review	(51)
Nsereko et al. (2021) Journal of Enterprising Communities	(52)
Obschonka et al. (2017) Small Business Economics	(53)
Obschonka et al. (2018) Journal of Vocational Behavior	(54)
Park et al. (2017) Sustainability	(55)
Patel (2019) International Entrepreneurship and Management Journal	(56)
*Pirhadi et al. (2021) Journal of Small Business Management	(57)
*Roundy et al. (2018) Strategic Organization	(58)
Ruiz-Arroyo et al. (2015) Investigaciones Europeas de Dirección y Economía de la Empresa	(59)
*Saadat et al. (2021) Education and Training	(60)
Sang and Lin (2019) International Journal of Emerging Technologies in Learning	(61)
*Sassetti et al. (2022) International Entrepreneurship and Management Journal	(62)
Siren et al. (2019) Journal of Business Research	(63)
Srivastava et al. (2021) Journal of Business Venturing	(64)
*Stanic (2020) Zagreb International Review of Economics & Business	(65)
*Tang (2016) Journal of Business Research	(66)
Tang et al. (2021) Journal of Small Business Management	(67)
*Tominc and Rebernik (2007) Small Business Economics	(68)
Troise and Tani (2021) Management Decision	(69)
*Tsou and Cheng (2018) Journal of Business & Industrial Marketing	(70)
*Urban (2017) Journal of Developmental Entrepreneurship	(71)
Urban and Wood (2017) European Journal of Innovation Management	(72)
Urban (2019) SA Journal of Human Resource Management	(73)
Urban (2019) South African Journal of Higher Education	(74)
Urban (2020) Journal of Small Business and Enterprise Development	(75)
*Urban and Msimango-Galawe (2020) Journal of Developmental Entrepreneurship	(76)
Uy et al. (2015) Journal of Vocational Behavior	(77)
Westhead and Solesvik (2016) International Small Business Journal	(78)
*Xie and Lv (2016) International Entrepreneurship and Management Journal	(79)
Yan et al. (2018) Sustainability	(80)
Yasir et al. (2017) Journal of Management Development	(81)
Zanella et al. (2019) International Journal of Entrepreneurial Behavior & Research	(82)
*Zhao et al. (2020) Sustainability	(83)
*Zhao et al. (2021) International Entrepreneurship and Management Journal	(84)

Abstrakt

CEL: *W ciągu ostatnich dwóch dekad koncepcja przedsiębiorczej czujności (EA) była uważana za kluczowy element w badaniu, w jaki sposób jednostki rozpoznają możliwości przedsiębiorcze. W rezultacie badania nad czujnością przedsiębiorczą znacznie się rozwinęły, przyciągając uwagę badaczy nie tylko z dziedziny przedsiębiorczości, ale także innych dyscyplin akademickich, w ramach których tę koncepcję badano z różnych perspektyw. Dlatego nadszedł czas, aby udokumentować skumulowaną wiedzę badaczy na temat czujności przedsiębiorczej. Niniejsze badanie ma na celu zapewnienie kompleksowego przeglądu jakościowego i oceny empirycznych badań czujno-*

ści przedsiębiorczej. ***METODYKA:*** *W oparciu o wieloetapowe podejście zastosowane w poprzednich badaniach, które gwarantuje systematyczny, przejrzysty i powtarzalny przegląd literatury, w tym badaniu zidentyfikowano ostateczną próbę 84 artykułów opublikowanych w czasopismach naukowych w latach 2005-2021, które empirycznie przetestowały koncepcję EA . Publikacje pochodzą z bazy Web of Science. Ich analiza obejmowała ewolucję opublikowanych artykułów, czasopism, które opublikowały najwięcej artykułów, krajów, w których przeprowadzono badania, zastosowanych skal pomiarowych oraz modeli badawczych, w których postawiono hipotezę czujności przedsiębiorczej i zbadano ją poprzez badania empiryczne.* ***WYNIKI:*** *Wyniki pokazują, że badania empiryczne dotyczące czujności przedsiębiorczej znacznie wzrosły od 2016 do 2021 roku, w którym to okresie publikowano prawie 11 artykułów rocznie. Siedem czasopism, które opublikowały artykuły, przyczyniło się do 28 procent wszystkich publikacji. Wyniki potwierdzają również, że większość badań empirycznych nad czujnością została przeprowadzona w krajach rozwijających się, z których Chiny wyróżniają się 14 publikacjami, co stanowi 16 proc. całości. Ponadto wyniki potwierdzają rosnący konsensus dotyczący konceptualizacji i pomiaru czujności przedsiębiorczej. Ostatecznie przegląd zaowocował identyfikacją pięciu szerokich modeli badawczych, w których postawiono hipotezę EA i zbadano ją poprzez badania empiryczne: poprzedniki, konsekwencje, mediacja, moderacja i moderowana mediacja. Najwięcej uwagi poświęcono modelowi badającemu konsekwencje lub skutki czujności przedsiębiorczej, który zawiera 59 artykułów w tym kontekście.* ***IMPLIKACJE****: Identyfikacja pojęć i rodzaju ich związku z czujnością przedsiębiorczą pomaga ocenić postęp badań empirycznych, a także obszary możliwości. W ten sposób przyszłe badania mogą wzmocnić i pogłębić ogólną wiedzę na temat czujności. Najczęściej badane tematy są również odzwierciedleniem wkładu czujności przedsiębiorczej w praktykę, zarówno na poziomie indywidualnym, jak i organizacyjnym. Ponadto badaczy zainteresowanych czujnością przedsiębiorczą zachęca się do rozważenia postępów poczynionych w pomiarze tego aspektu, który oferuje alternatywy dla badań.* ***ORYGINALNOŚĆ I WARTOŚĆ:*** *W oparciu o przegląd literatury niniejsze badanie organizuje badania empiryczne czujności przedsiębiorczej w różnych modelach badawczych, które dostarczają ważnych informacji na temat tego procesu. Ponadto niniejsze badanie odkrywa potencjalne obszary, którymi należy się zająć, a tym samym stanowi wkład w badanie czujności przedsiębiorczej.*

Słowa kluczowe: *czujność przedsiębiorcza, systematyczny przegląd literatury, szansa przedsiębiorcza, modele badawcze, rozpoznawanie szans, czujność, przedsiębiorczość*

Biographical note

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Conflicts of interest

The author declares no conflict of interest.

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The linkage between economic literacy and students' intention of starting business: The mediating role of entrepreneurial alertness

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Abstract

PURPOSE: *Enhancing the number of entrepreneurs is a major study to combat economic and social problems. Psychological factors considered as effective stimulants for entrepreneurial behavior have attracted many researchers in the last decade. The purpose of this research attempts to examine how the influence of economic literacy can promote the intention of starting a new business among students and explore the role of entrepreneurial alertness in mediating this relationship.* ***METHODOLOGY:*** *The research adopted a quantitative approach in which hypotheses were statistically estimated using partial least square structural equation modeling (PLS-SEM) based on survey data using a self-administered questionnaire (n=450) from several universities in Indonesia.* ***FINDINGS:*** *The analysis indicates that economic literacy has a significant effect on students' entrepreneurial alertness and intention to start a new business. Indeed, entrepreneurial alertness can mediate the relationship between economic literacy and the intention of starting a new business. However, among entrepreneurial alertness dimensions, scanning and search failed in determining the students' intention of starting a new business.* ***IMPLICATIONS:*** *The result of this research can provide insight into the literature on the entrepreneurship theme and policymakers*

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concerned with delivering new business creation. Besides, educational institutions can consider the matter of economic literacy to be part of their curricula in order to foster the students' intention of starting a business. In addition, economic literacy also needs to be associated with examples relevant to entrepreneurial activities, especially in production, distribution, and online marketing. ***ORIGINALITY AND VALUE:*** *The interesting findings of this paper serve as a reminder that entrepreneurial alertness is one of the predictor variables and mediators for raising the students' intention. This implies that entrepreneurial alertness can be enhanced by economic literacy, as well as how they need to be used to improve course curriculum and the teaching pedagogy. Furthermore, educational institutions could provide business internship programs and entrepreneurship incubators to raise the students' intention of starting business.*
Keywords: *economic literacy, entrepreneurial alertness, intention, starting business*

INTRODUCTION

Entrepreneurship remarkably contributes to economic development in many countries (Pradhan et al., 2020). The essential of entrepreneurial involvement can be proxied by creating new small and medium business scale (SMEs) that can be a win-win solution for the poverty problem, social issue, and developing economies (Lee et al., 2022; Sohu et al., 2022). Providing more SMEs by enhancing entrepreneurs can have benefits for creating new job opportunities, which in turn drives economic welfare (Osei & Zhuang, 2020; Liu et al., 2021). Entrepreneurship is considered synonymous with self-employment and is therefore seen as an appropriate strategy for addressing issues such as employability, especially among young people. Therefore, enhancing the intention of starting a business among students is considered as promising potential business creation.

In the last decade, the studies on entrepreneurial intention and new business creation have been enormous. There is an extending interest in exploring the psychological factors for predicting an increase of entrepreneurial intentions (Neneh, 2019; Ward et al., 2019; Doanh, 2021). In those studies, the theory of planned behavior (TPB) has been involved as a strong reference to explain how psychological factors are predictors of entrepreneurial intentions and behavior. In addition to investigating psychological factors, some consensus is in agreement that entrepreneurship education is a major consideration in driving students' intention for business (Hassan et al., 2021; Mukhtar et al., 2021). However, predicting intention for entrepreneurship from the perspective of economics is often overlooked among scholars (Suratno et al., 2021). Understanding the basic concept of economics can help individuals or students make a decision, including determining their choice of a job after graduation.

Economic literacy enables students to acknowledge and involve basic economic terms and the way of thinking to raise and gain prosperity (Reichert-Schlax et al., 2022). Economic literacy is pivotal to raising knowledge about the costs or benefits of an item in economic and business activity (Jappelli, 2010). A recent study by James and Sahid (2022) remarked that the role of economic literacy could be a basis for students to make a decision, including entrepreneurial career intention. In addition to economic literacy, this research also engages entrepreneurial alertness, which is often missing from Indonesian research, to explain the intention of initiating a new business. The interconnectedness of these two matters is that entrepreneurial alertness covers the individuals' ability to know and raise opportunities and economic literacy also deals with trade-offs and opportunities, which in turn can foster the intention of starting a new business (Neneh, 2019; Li et al., 2020).

The primary goal of this research is to fill an under-addressed gap in the existing literature by identifying whether or not economic literacy can predict students' intention for entrepreneurship in Indonesia. The study in Indonesia is unique because, culturally, Indonesia has a mindset that being a civil servant is more promising than being an entrepreneur, and this produces an insufficient number of new business creations (Wahyono et al., 2021). Moreover, the mediating role of entrepreneurial alertness is also performed in this present research. This study offers insight into both literatures on the entrepreneurship theme and government policymakers that are concerned with providing new business creation from university graduates. This study provides hypotheses to comprehend the linkage between variables and presents evidence from the context of Indonesia for the relationship between economic literacy, entrepreneurial alertness, and intention to start a new business.

This paper is outlined as follows. Section one focuses on the issues and background of the research. Section two concerns the literature review, accompanied by methods used in Section three. Section four presents the finding and discussion of the study, while a conclusion is provided in Section five.

LITERATURE REVIEW

Entrepreneurial alertness and economic literacy

Entrepreneurial alertness is a topic of concern for scholars in the field of entrepreneurship (Tang et al., 2021; Lanivich et al., 2022). Entrepreneurial alertness is defined as the process and action linked with looking for opportunities based on prior knowledge. A preliminary literature also noted

that entrepreneurial alertness includes creative and innovative action in discovering opportunities (Lu & Wang, 2018). This remarks that previous economic understanding or economic literacy obtained from the classes will potentially affect entrepreneurial alertness. Economic literacy is a set of knowledge, basic economic principles, and their practice in regulating the economy, which is obtained through the learning process in the classroom (Setiawan et al., 2020). Economic literacy, obtained through theory and practice in the teaching and learning process, is expected to raise students' entrepreneurial alertness and escalate the intentions of initiating a new business (Cameron & Lim, 2019).

Some scholars documented that entrepreneurial alertness is proxied by three alert activities: alert scanning and search, association and connection, evaluation and judgment (Pirhadi et al., 2021; Pratomo & Wardani, 2021). Alert scanning and search enable individuals to search and explore new unique ideas based on relevant information and knowledge they have obtained (Sassetti et al., 2022). This information and knowledge can be accomplished both from schools during economics classes and open sources of information. This scanning and search dimension will help develop the cognitive process of students that can further impact the intention (Levasseur et al., 2020). A prior study mentioned that the dimension of scanning and search is the accruing experience and learning for a particular domain (Sassetti et al., 2022). Since the content of entrepreneurship and economics are dynamic, it will benefit from alert scanning and search (Pirhadi et al., 2021).

In addition to alert scanning and search, another dimension of entrepreneurial alertness that affects the intention of starting a new business is association and connection. Association and connection are concerned with obtaining information and providing a link to the existing condition (Fatoki & Oni, 2015). Association enables students to make a decision within several choices and provides unconventional connections (Liang, 2019). This statement is in agreement with the purpose of economic literacy, which aims to help an individual to make a rational economic decision by considering cost and benefit analysis (Lusardi, 2019). Some scholars revealed that association and connection also recall prior knowledge from the cognitive process (Fatoki & Oni, 2015; Sassetti et al., 2022). It indicates that economic literacy plays a great role in raising alert association and connection.

Lastly, the dimension of entrepreneurial alertness that has nexus between economic literacy and the intention of starting a business is evaluation and judgment. The business intention is a willingness that incorporates individuals to create a business (Rasli et al., 2013), and it requires an evaluation and judgment process. Setiawan et al. (2020) stated that economic literacy helps students with the evaluation and judgment stages of providing business

ideas. Therefore, it is argued that economic literacy has a link with alert evaluation and judgment, which in turn affects their intention. This relation is confirmed by some scholars who remarked that there is a positive effect on entrepreneurial intentions (Rastiti et al., 2021; Rizqi et al., 2022). The primary rationale is that economic literacy covers people's skills and capabilities that can be adopted in economic activities and decision-making processes. In addition, having economic literacy will encourage students to seek out the solution to complex economic problems and can apply the theory obtained to solve problems (Nurjanah et al., 2018; Suratno et al., 2021). Thus, the hypotheses are provided as follows.

H1: Economic literacy positively impacts the intention of starting new business.
H2: Economic literacy positively impacts scanning and search.
H3: Economic literacy positively impacts association and connection.
H4: Economic literacy positively impacts evaluation and judgment.

Economic literacy, entrepreneurial alertness, and intention of starting new business

The study of economic literacy has developed significantly to date and it has raised attention among academicians and policy researchers. The National Council for Economic Education (NCEE) provided 20 standards that mention what students should understand at high school or college level. To measure economic literacy, there is a test that can be tested related to economic literacy. In addition, Walstad et al. (2013) suggested that there was a revision of the fourth edition of the economic literacy test (Test of Economic Literacy, TEL). The economic literacy test is a nationally standardized and normed economic estimate of student understanding in high schools in the United States. In addition to asking about a basic understanding of economics, it turns out that the scope of economic literacy is very broad (Lusardi, 2019).

The practice of preparing a business plan with classmates is forecasted to foster students' intention to start a new business. Through the economic theories obtained, students are prepared to face risks and from the possibility of failure in running a business. Therefore, economic literacy will enable students to deal with the business opportunities that exist in the surrounding environment, dare to plan, and increasingly intend to open a business. Another study found that economic literacy contributes to the level of intention of digital businesses start-ups (Suparno et al., 2020). In addition to raising the intention of starting a new business, economic literacy can also be linked with entrepreneurial alertness. As mentioned previously, economic

literacy concerns the basic concept of economics, which can be a basis for students' knowledge and information on entrepreneurship (Lusardi, 2019).

Entrepreneurial alertness enables individuals to take advantage of information that is available to create entrepreneurial opportunities through association and connection capabilities followed by the evaluation process (Fatoki & Oni, 2015). The study conducted by Uy et al. (2015) and Obschonka et al. (2017) noted the mediating role of entrepreneurial alertness, whose dimensions are scanning and search, association and connection and evaluation and judgment. This is very logical, considering that entrepreneurial alertness is an important skill that entrepreneurs must have to be successful in establishing a new business. The ability to search and sort, classify and link various opportunities, and evaluate and decide which opportunities to choose, are skills that not only support but also increase the intention of entrepreneurs to set up new businesses (Sassetti et al., 2022).

The economic and entrepreneurship literature notes that entrepreneurial alertness is the entrepreneurial capability to spot opportunities that are not visible to others, and these opportunities are obtained without having to conduct a search (Kirzner, 1979). Furthermore, a study has noted that entrepreneurial alertness can be increased by having a supportive and friendly environment (Fatoki & Kim, 2015). At the initial stage, an entrepreneur needs to find all information required (scanning and search) to minimize business risks. If entrepreneurial alertness is high, they will also have high entrepreneurial intentions (Sassetti et al., 2022). Furthermore, identification of opportunities is further evaluated and considered (evaluation and judgment), through a process of conscious cognitive ability with individual awareness of the surrounding environment and previous economic literacy (Fatoki & Kim, 2015). Therefore, the hypotheses are presented as follows.

H5: Scanning and search positively impact the intention of starting a new business.

H6: Association and connection positively impact the intention of starting a new business.

H7: Evaluation and judgment positively impact the intention of starting a new business

H8: Association and connection mediate the impact of economic literacy and the intention of starting a new business.

H9: Evaluation and judgment mediate the impact of economic literacy and the intention of starting a new business.

H10: Scanning and search mediate the impact of economic literacy and the intention of starting a new business.

METHODOLOGY

Study design

This present research involved a cross-sectional survey with a quantitative approach with partial least square structural equation modeling (PLS-SEM) in justifying the conceptual framework and proposed hypothesis. In particular, this study confirms how economic literacy affects the intention of starting a new business among Indonesian university students and examines the role of entrepreneurial alertness as a mediating variable. This study was conducted in selected universities in Indonesia, including Jakarta, Semarang, and Malang. The locations were selected because these cities are the destinations for students taking up a university education. Also, Malang and Semarang are famous for their rapidly growing tourism business sector, as well as local government support in an effort to increase the number of new entrepreneurs, while Jakarta is the capital city in Indonesia. In addition, the research model in this paper is provided in Figure 1. From the figure, it can be explained that the research model is formed from preliminary papers and relevant underpinning theories.

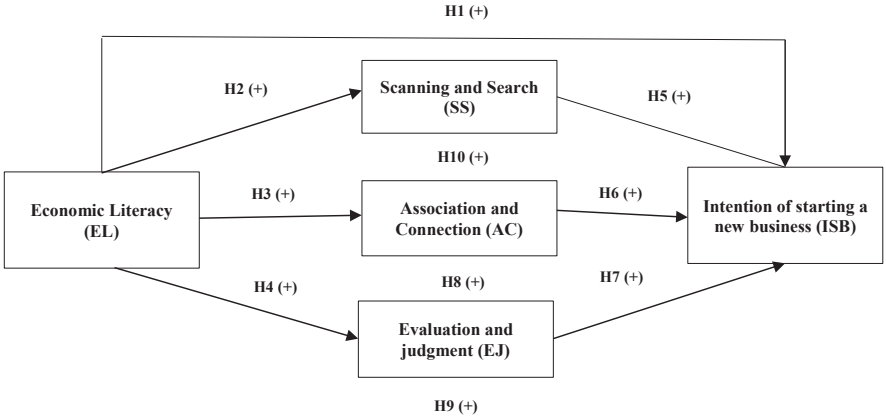

Figure 1. The research model

Source: Modified from Lin et al. (2017); Walstad and Robson (1997); Suratno et al. (2021); Tang et al. (2012).

Data collection

For this research, a convenience sample of 450 university students in Jakarta, Semarang and Malang of Indonesia was employed to represent the intention of starting a new business. This sampling method was chosen because the sampling frame is unavailability and due to its relative speed

and ease. However, care was taken to avoid bias in acquaintance with the sampling approach. The data collection process was initiated by distributing online questionnaires in Google Forms to respondents using students' email addresses and WhatsApp, with the students being asked to complete the questionnaires voluntarily. At the initial stage, we distributed 450 online questionnaires to the respondents, and we collected back these questionnaires for further analysis. During this process, we removed approximately 39 incomplete questionnaires and outliers, which were determined using SPSS. At this stage, we had a 91.33 percent response rate, which is a good response. The study was performed during January and May 2022, and it was followed up two weeks later. The criteria of respondents in this research were students who have attended entrepreneurship education and economic education, and were actively involved in entrepreneurial activities organized by their campuses, to acknowledge their previous experience and understanding of economics and entrepreneurship.

Variable measurement and data analysis

Figure 1 explains that the model is guided by the conceptual research. It was generated through relevant literature and some prior studies. The intention of starting a new business (ISB) that is involved in this study was adapted from Lin et al. (2017), while economic literacy (EL) was performed using indicators from Walstad and Robson (1997). Furthermore, entrepreneurial alertness employed in this research was modified instruments from Tang et al. (2012). In detail, it covers the dimensions of scanning and search (SS) in as many as nine items, association and connection (AC) with three items, and evaluation and judgment (EJ) with four items. The study incorporated a Likert scale of 1 (strongly disagree) to 5 (strongly agree) to show the respondent's responses. Furthermore, we performed a measurement model (outer model), structural model (inner model), goodness of fit, and hypothesis testing. The measurement model covers convergent validity, discriminant validity, and composite reliability. The inner model is a structural model for predicting the causality relationship between latent variables and consists of measuring R-square, F-Square, and Q-square (Hair et al., 2020).

Common method variance estimation

To evaluate the presence of bias, this study followed criteria from Kock and Gaskins (2014); Hair et al. (2013) to achieve the common method variance when the full collinearity test is lower than 5.00.

RESULTS

Table 1 informs the demographic respondents that participated in this research, which was dominated by female students (60.83 percent). Capturing from parents' occupations, most respondents are from entrepreneurs' families (47.25%) followed by farmers (30.41%) and teacher/lecturer families. The participants of this research were students that enrolled in 2018 and 2019 and came from three universities, namely Universitas Negeri Malang, Universitas Negeri Semarang, and Universitas Negeri Jakarta. The table also informs the subject background of studies with the composition of economics education (57.17 percent), accounting (11.69 percent), and management (31.14).

Table 1. The respondents' profile

S/No.	Information	Frequency	%
1.	Gender		
	Female	250	60.83
	Male	161	39.17
2.	Year class		
	2018	221	53.77
	2019	190	46.23
3.	Parents' occupation		
	Entrepreneur	195	47.45
	Teacher/Lecturer	50	12.16
	Farmers	125	30.41
	Civil Servants	41	9.98
4.	Subject		
	Management	128	31.14
	Economic Education	235	57.17
	Accounting	48	11.69

Measurement model

The estimation results suggest that the CR scores received for each construct range from 0.712 to 0.901 (> 0.70), while Cronbach's alpha ranges from 0.780 to 0.921 (>0.70). Both CR and Cronbach's alpha fulfilled the construct reliability and convergent validity, indicating that the three latent constructs in this research have high levels of internal consistency (Hair et al., 2013). Table 6 shows that the AVE value of each variable is between 0.658 to 0.752 (> 0.50) so that it fulfills convergent validity.

Discriminant validity

The discriminant validity in this research was performed using Fornell-Larcker criterion (Fornell & Larcker, 1981). The statistical calculation showed that the cross-loading value or diagonal bold value should be higher than the cut-off value of 0.70. As informed in Table 2, the diagonal bold value of each construct is higher than 0.70, indicating the criteria were accomplished. In addition, Henseler and Schuberth (2014) suggested measuring discriminant validity using the heterotrait-monotrait ratio (HTMT) with the cut-off value of 0.90. The analysis shows that the variables EL, SS, AC, EJ, and ISB have ratios below 0.90, and it indicates that the outputs support the existence of discriminant validity for every construct estimated (see Table 3).

Table 2. Discriminant validity (Fornell-Larcker)

	AC	EJ	EL	ISB	SS
AC	**0.811**				
EJ	0.794	**0.815**			
EL	0.654	0.668	**0.867**		
ISB	0.746	0.725	0.751	**0.867**	
SS	0.772	0.631	0.629	0.636	**0.841**

Table 3. Discriminant validity (HTMT)

	AC	EJ	EL	ISB	SS
AC					
EJ	0.703				
EL	0.803	0.761			
ISB	0.890	0.811	0.819		
SS	0.841	0.721	0.701	0.691	

Variance inflation factor

The collinearity is performed considering a variance inflation factor (VIF) coefficient that should be less than 5.00 (Hair et al., 2013). To evaluate the presence of bias, this study followed criteria from Hair et al. (2013) to achieve the common method variance when the full collinearity test is lower than 5.00. Table 4 provides the output for EI, EL, FEE and PG variables, which have coefficients of VIF that are under 5.00, meaning there is no collinearity. Therefore, all of the estimated constructs are satisfied and can be performed for further analysis.

Table 4. Variance inflation factor (VIF)

	AC	EJ	EL	ISB	SS
AC				4.066	
EJ				3.025	
EL	1.000	1.000		2.091	1.000
ISB					
SS				2.659	

Goodness of fit model

Table 5 informs the output of the goodness of fit analysis. From the table, it can be seen that the scores of α (0.740-0934), CR (0.852-0.948), and AVE (0.658-0.752) have satisfied the criteria for goodness developed by Hair et al. (2013, 2020). Therefore, it can be remarked that the structural and measurement models in this research can be stated as goodness.

Table 5. Goodness of fit estimation

Information	α	CR	AVE	Decision
Association and connection (AC)	0.740	0.852	0.658	goodness
Evaluation and judgment (EJ)	0.831	0.887	0.664	goodness
Economic literacy (EL)	0.890	0.924	0.752	goodness
Intention of starting a new business (ISB)	0.934	0.948	0.751	goodness
Scanning and search (SS)	0.896	0.923	0.707	goodness

Hypothesis testing

The hypothesis estimation is performed using a statistical t-test where the criteria of t-count should be 1.645, and the p-value should be lower than 0.050. Table 6 provides information about the statistical results of the eight hypotheses proposed. The results showed that seven hypotheses were accepted, with a t-value ranging from 2.996 to 18.373 and a p-value ranging from 0.000 to 0.031. However, one hypothesis did not satisfy the criteria

Table 6. The summary of hypothesis testing via bootstrapping

Hypothesis	Connectivity	β	SE	T-value	*P*-value	Confidence Interval (BC)		Supported
						LL	UL	
H_1	EL → ISB	0.407	0.052	7.763	0.000	0.314	0.486	Yes
H_2	EL → SS	0.629	0.034	18.373	0.000	0.568	0.681	Yes
H_3	EL → AC	0.654	0.038	17.102	0.000	0.587	0.714	Yes

Hypothesis	Connectivity	β	SE	T-value	*P*-value	Confidence Interval (BC)		Supported
						LL	UL	
H_4	EL → EJ	0.668	0.038	17.805	0.000	0.602	0.728	Yes
H_5	SS → ISB	0.014	0.056	0.255	0.399	0.012	-0.088	No
H_6	AC →ISB	0.315	0.069	4.559	0.000	0.201	0.434	Yes
H_7	EJ → ISB	0.195	0.064	3.051	0.001	0.093	0.300	Yes

Notes: t-value >1.645 (one-tailed test), p < 0.05, BC=bias corrected, UL= upper level, LL=lower level, SE-standard error, β= path coefficient.

Mediating estimation

The calculation in Table 7 shows that the two indirect effects, β = 0.206, β = 0.130, and β = 0.203 were significant with t-values of 4.322 and 2.996. The indirect effects 95% Boot CI Bias Corrected: [LL = 0.136, UL = 0.291], [LL = 0.066, UL = 0.206], and [LL =0.045, UL = 0.071], did not straddle a 0 in between, showing that there is a mediation effect (Preacher & Hayes, 2008).

Table 7. Mediating effect

Hypothesis	Connectivity	β	SE	T-value	*P*-value	Confidence Interval		Supported
						LL	UL	
H_8	EL→AC→ ISB	0.206	0.048	4.322	0.000	0.136	0.291	Yes
H_9	EL→EJ→ ISB	0.130	0.043	2.996	0.001	0.066	0.206	Yes
H_{10}	EL→SS→ ISB	0.203	0.040	2.531	0.000	0.045	0.071	Yes

Figure 2 is the final model of SEM from this paper. Based on this figure, it can be seen that EL has a direct effect on SS, AC, and EC, with t-values of 8.908, 16.761, and 17.627, respectively.

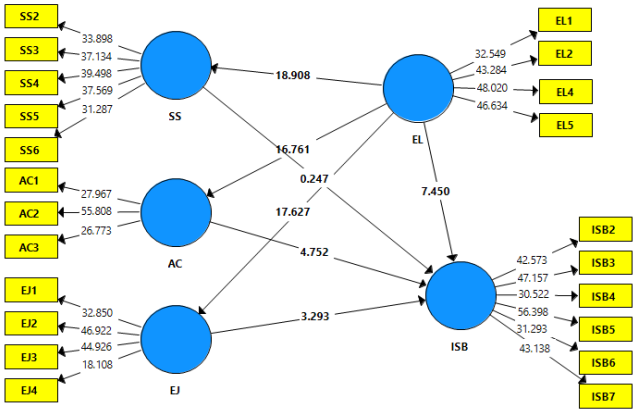

Figure 2. Final model of SEM

Furthermore, EL also has a direct effect on ISB with a t-value of 7.450. Based on Figure 2, it is also known that EJ and AC have a direct effect on ISB, with t-values of 3.293 and 4.752. Unfortunately, SS has no direct effect on ISB because of the t-value < 1.645 (0.247) and p-value > 0.05. Figure 2 also explains that of the ten hypotheses proposed in this paper, nine hypotheses are accepted and one is rejected.

DISCUSSION

This research attempts to examine how economic literacy connects directly to the intention of starting a new business and also connects indirectly through entrepreneurial alertness as a mediating variable. Of the ten proposed hypotheses, our study accepted nine and rejected one hypothesis. The first finding revealed that economic literacy has an effect on the intention to initiate a new business among students. The basic rationale is that economic literacy covers a basic understanding of economics, i.e., trade-off, opportunity cost, entrepreneurship. This finding is an agreement with Suratno et al. (2021), which found that economic literacy could foster the intention of entrepreneurship. It remarks that having sufficient economic literacy will be beneficial for students to make a greater economic and entrepreneurial decision, which in turn affects their intention. This finding also supports some prior studies that confirmed this relationship (e.g., Setiawan et al., 2020; Rastiti et al., 2021; Rizqi et al., 2022). Indeed, with economic literacy, individuals can deal with complex economic problems and can apply the theory obtained to solve issues in initiating a new business (Nurjanah et al., 2018; Suratno et al., 2021).

In addition to influencing their intention to starting a new business, economic literacy also enables students to have the ability to scan and search (SS), and evaluate and judge (EJ). The logical thinking to support these outcomes is that economic literacy as a life skill that can be used in economic and entrepreneurial activities. Economic literacy that has been obtained by students in the schools and other resources has been processed in a cognitive dimension (Lusardi, 2019). As previously mentioned, alert scanning and search involves the cognitive ability to determine the action of looking for new opportunities that are unique and unconventional (Cameron & Lim, 2019). Similarly, economic literacy can also impact on alert association and connection as the second process after scanning and search (Sassetti et al., 2022). These findings support antecedent studies by Lin et al. (2017); Setiawan et al. (2020) who mentioned that economic literacy is a cognitive source for an entrepreneur in increasing entrepreneurial sensitivity, which

includes scanning and search, association and connection, as well as evaluation and judgment on existing business opportunities.

Furthermore, this study also confirmed the connectivity between the entrepreneurial alertness dimension (alert scanning and search, association and connection, evaluation and judgment) and the students' intention to create a new business. This result is rational and strengthens the findings of many previous scholars (Doanh et al., 2021; Neneh, 2019; Urban, 2019), who showed that association and connection as well as evaluation and judgment are part of entrepreneurial alertness that had a positive effect on the intention to establish a new business and pursue existing opportunities from their new business. Association and connection, as well as evaluation and judgment, not only enable entrepreneurs to identify new business opportunities that are missing or not thought of by others, but also provide consideration in making decisions appropriately and effectively (Fatoki & Oni, 2015). Someone who has a high sensitivity to the existence of business opportunities will increasingly intend to establish a new business that is different from the existing businesses in the community (Sassetti et al., 2022).

In addition, individuals who are aware of entrepreneurial opportunities are more likely to be involved in an entrepreneurial career path because it provides broad opportunities for these individuals to move according to the identified opportunities (Hu & Ye, 2017; Neneh, 2019). Although this study found that alert association and connection, alert evaluation and judgment had a positive effect on the intention to set up a new business, alert scanning and search failed in explaining students' intention of starting new business. This finding contradicts a number of previous studies (Doanh et al., 2021; Neneh, 2019; Urban, 2019). However, the output of this study will highlight the advantages as important inputs for universities and stakeholders to be more active in improving economic literacy for students. The aim is to not only increase association and connection, and evaluation and judgment, but also scanning and search as important predictors in increasing students' intention to establish new businesses.

Lastly, the findings noted that alert association and connection, alert evaluation and judgment, as well as scanning and search could mediate the effect of economic literacy on the students' intention to set up a new business. The basic explanation to support this finding is that entrepreneurial alertness deals with the decision process to enhance opportunities through process of association and evaluation. The mediating role of entrepreneurial alertness notes that through scanning and searching, associating and connecting, assessing and judging, individuals with higher levels of alertness are actively identifying and taking advantage of new opportunities to become entrepreneurs. This result strengthens the studies of several

previous scholars (Doanh et al., 2021; Neneh, 2019; Urban, 2019), where association and connection, and evaluation and judgment can be mediating variables of the influence of economic literacy on the intention to establish a new business. Entrepreneurial alertness increases the level of personal search and scanning, gathering relevant information, making decisions about identifying opportunities, and shaping entrepreneurial intentions and actions. This outcome can be a new insight that to increase the intention to initiate a new business, the association and connection and evaluation and judgment should obtain more attention. Individuals need to take advantage of the available information through search, association and connection, evaluation and assessment as well as prior knowledge of economics in economic literacy (Montiel Campos, 2017). Thus, association and connection as well as evaluation and judgment, as an important part of being aware of business opportunities, can mediate the effect of economic literacy on the intention to establish a new business.

CONCLUSION

This research aims to examine the relationship between economic literacy, entrepreneurial alertness, and students' intention to start a new business, as well as to understand the mediating role of entrepreneurial alertness. This research confirmed eight hypotheses proposed and rejected one hypothesis. In detail, economic literacy can have an impact on students' entrepreneurial alertness and intention to start a new business. Indeed, entrepreneurial alertness can mediate the relationship between economic literacy and the intention of starting a new business. However, among entrepreneurial alertness dimensions, scanning and search failed in determining the students' intention of starting a new business. The findings can be a new insight to increase the intention to establish a new business, economic literacy, and entrepreneurial alertness, which includes scanning and search, association and connection, and evaluation and judgment dimensions.

This study provides some implications. First, it presents essential inputs for universities and stakeholders to be more active in improving economic literacy for students. In addition to improving entrepreneurship education through practice and project-based learning, economic literacy must be improved through learning economics. This paper also has practical implications for increasing students' intention to establish new businesses, and economic literacy must be renewed. Furthermore, economic literacy also needs be associated with examples relevant to entrepreneurial activities, especially in the aspects of production, distribution, and online marketing.

The logical consequence of this finding is that economic education and entrepreneurship education in universities must reinforce each other. Likewise, the activity of presenting economic and entrepreneurship experts on campus through seminars and workshops can increase the dimensions of mindset and intention to establish new businesses.

Like other papers, this study has limitations. This research only examines some of the important predictors of the intention to establish a new business, namely economic literacy and entrepreneurial attitude, which includes scanning and search, association and connection, and evaluation and judgment. Further research needs to test the full model involving the theory of planned behavior (TPB) by Ajzen (1991). Future researchers also need to involve respondents from various universities in Indonesia and other countries to reach more holistic and generalizable results.

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Abstrakt

CEL: *Zwiększenie liczby przedsiębiorców jest ważnym badaniem mającym na celu zwalczanie problemów gospodarczych i społecznych. Czynniki psychologiczne uważane za skuteczne stymulatory zachowań przedsiębiorczych przyciągnęły wielu badaczy w ostatniej dekadzie. Celem tych badań jest próba zbadania, w jaki sposób wpływ wiedzy ekonomicznej może promować zamiar założenia nowej firmy wśród studentów oraz zbadanie roli czujności przedsiębiorczej w pośredniczeniu w tej relacji.* ***METODYKA:*** *W badaniu przyjęto podejście ilościowe, w którym hipotezy zostały oszacowane statystycznie przy użyciu modelowania równań strukturalnych (PLS-SEM) w oparciu o dane ankietowe z wykorzystaniem samodzielnie wypełnionego kwestionariusza (n=450) z kilku uniwersytetów w Indonezji.* ***WYNIKI:*** *Analiza wskazuje, że znajomość ekonomii ma znaczący wpływ na czujność uczniów w zakresie przedsiębiorczości i zamiar rozpoczęcia nowej działalności gospodarczej. Rzeczywiście, przedsiębiorcza czujność może pośredniczyć w związku między znajomością ekonomii a zamiarem założenia nowej firmy. Jednak wśród wymiarów czujności przedsiębiorczej skanowanie i wyszukiwanie nie powiodło się w określeniu intencji studentów do założenia nowej firmy.* ***IMPLIKACJE:*** *Wynik tych badań może zapewnić wgląd w literaturę na temat przedsiębiorczości i decydentów zainteresowanych tworzeniem nowych przedsiębiorstw. Poza tym instytucje edukacyjne mogą rozważyć kwestię umiejętności ekonomicznych jako część swoich programów nauczania, aby wspierać zamiary studentów dotyczące zakładania działalności gospodarczej. Ponadto znajomość ekonomii musi być powiązana z przykładami odnoszącymi się do działalności przedsiębiorczej, zwłaszcza w zakresie produkcji, dystrybucji i marketingu internetowego.* ***ORYGINALNOŚĆ I WARTOŚĆ:*** *Interesujące wyniki tego artykułu przypominają, że czujność przedsiębiorcza jest jedną ze zmiennych predykcyjnych i mediatorów zwiększania intencji uczniów. Oznacza to, że czujność przedsiębiorczą można zwiększyć dzięki znajomości zagadnień ekonomicznych, a także w jaki sposób należy je wykorzystać do ulepszenia programu nauczania i pedagogiki nauczania. Ponadto instytucje edukacyjne mogłyby zapewnić programy staży biznesowych i inkubatory przedsiębiorczości, aby wzbudzić w studentach chęć rozpoczęcia działalności gospodarczej.*

Słowa kluczowe*: wiedza ekonomiczna, czujność przedsiębiorcza, intencja, rozpoczęcie działalności gospodarczej*

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Conflicts of interest

The authors declare no conflict of interest.

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