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Psychological determinants of entrepreneurial intentions and behaviors

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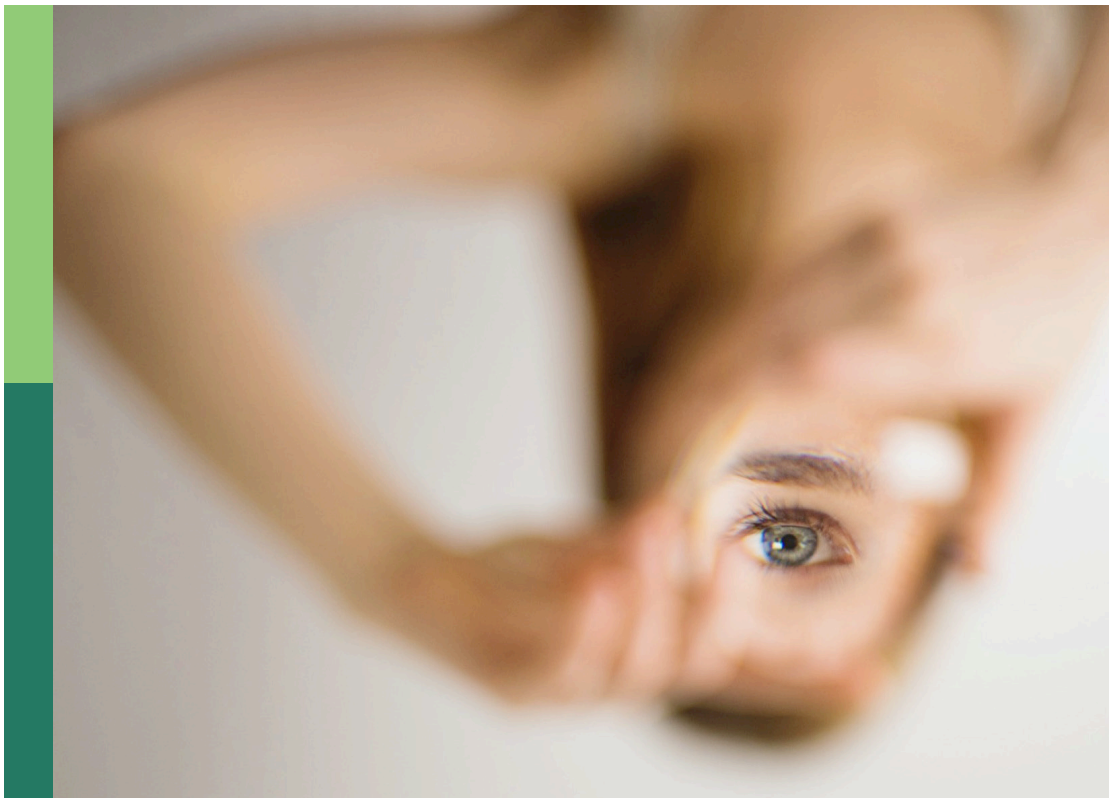

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Psychological determinants of entrepreneurial intentions and behaviors

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Editorial: Psychological determinants of entrepreneurial intentions and behaviors; contributions of Robert D. Hisrich to the field of entrepreneurship

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KEYWORDS

psychology, personality, entrepreneurship, entrepreneurial intentions, behaviors

Editorial on the Research Topic
Psychological determinants of entrepreneurial intentions and behaviors

Introduction

Professor Robert D. Hisrich, Ph.D., the co-editor of this Research Topic, passed away in February 2023, so we decided to dedicate this editorial to him and his work and describe articles in this Research Topic (a Research Topic on *Psychological determinants of entrepreneurial intentions and behaviors*) considering extensions of his research.

Robert D. Hisrich

Robert D. Hisrich, born in 1944, was a wonderful person, the best mentor, the best professor, and one of the greatest scholars of all time in the field of entrepreneurship. We are very grateful to him for helping, teaching, and inspiring us and numerous academics and practitioners globally. He will live in our hearts and memories forever. His works will be read and cited also by future generations.

Professor Hisrich was the Bridgestone Chair of International Marketing & Director of The Global Management Center and International Programs at Kent State University, Kent, Ohio. He also held visiting or honorary professor positions at universities in six different countries outside the United States (e.g., the longest cooperation with the School of Economics and Business at the University of Ljubljana, Slovenia, since 1995). His past positions included, e.g., Garvin Professor of Global Entrepreneurship and Director, Walker Center for Global Entrepreneurship, Thunderbird School of Global Management, Phoenix, Arizona; Malachi Mixon III Chair in Entrepreneurial Studies and Professor and Chair of Strategy Division and Entrepreneurship Division, Weatherhead School of Management, Case Western Reserve University, Cleveland, Ohio; Chair of the Entrepreneurship Division of the Academy of Management; Bovaird Chair of Entrepreneurial Studies and Private

Enterprise and Professor of Marketing, College of Business Administration, University of Tulsa, Tulsa, Oklahoma; Associate Professor of Marketing, Graduate School of Management, Boston College, Chestnut Hill, Massachusetts; Adjunct Professor of Marketing and Technology, Innovation Center, Massachusetts Institute of Technology, Cambridge, Massachusetts; Faculty Associate Small Business Development Center; Director, Small Business Institute; Director, H&B Associates, a marketing and management-consulting firm. He authored or co-authored 37 books and more than 300 articles on entrepreneurship, international business, venture capital, management, and marketing.

His two most influential books were Entrepreneurship (Hisrich et al., 2020), 11 published editions and the 12th in preparation, and The Woman Entrepreneur (Hisrich and Brush, 1985). The Entrepreneurship books broadened the horizons of entrepreneurship, starting businesses, and managing small and medium-sized enterprises (SMEs) and large corporations of numerous entrepreneurs, businesspeople, students, government officials, and others. It has been read globally in English and other languages. The Woman Entrepreneur book highlights the importance of women in entrepreneurship and their characteristics. The famous definition of entrepreneurship states (Hisrich et al., 2005, p. 8; Hisrich et al., 2007, p. 576) the following: "Entrepreneurship is the process of creating something new with value by devoting the necessary time and effort, assuming the accompanying financial, psychic, and social risks, and receiving the resulting rewards".

His most influential articles—the top 30 publications with 10 or more citations in the Web of Science—are displayed in Table 1. His articles were the most influential in 10 areas (Table 2), among which the top 3 were business, management, and economics, followed by psychology (applied and multidisciplinary). Specifically, the topics covered by his works were intrapreneurship, venture capital, female entrepreneurship, psychological aspects of entrepreneurship, SME internationalization, ethics of entrepreneurs, entrepreneurship in transition economies, new venture creation, and marketing.

Psychological determinants of entrepreneurial intentions and behaviors

Current researchers in the field of entrepreneurship are standing on the shoulders of giants—the past researchers (Robert D. Hisrich and others), who made prior developments to theories and concepts. For example, Hisrich (1990) presented the features of entrepreneurship and intrapreneurship from a psychological perspective. This Research Topic covers topics in entrepreneurial psychology with a range of original research articles from different research areas and perspectives that examine personality determinants of entrepreneurship and used data from various countries (Australia, China, Malaysia, Saudi Arabia, Slovenia, Spain, South Africa, and the United States of America). Hisrich et al. (2007, p. 575) motivated researchers within entrepreneurial psychology "to develop theory and undertake empirical research focusing on five key topic areas: the personality characteristics of entrepreneurs, the psychopathology of entrepreneurs, entrepreneurial cognition, entrepreneurship education, and international entrepreneurship". This Research Topic focused mostly on the personality characteristics of entrepreneurs.

Antoncic (2020) proposed directions for future research: "Personality correlates of entrepreneurs need to be researched in cross-cultural comparative studies and in studies that include sociological elements, which may be related to the formation of the personality or behavior of individuals with entrepreneurial intentions and entrepreneurs and intrapreneurs. The personality differences between entrepreneurs and intrapreneurs also need to be investigated in greater detail in future research. Theoretical models need to be, on one hand, more comprehensive (with many different correlates) and, on the other hand, more detailed (with many sub-dimensions and facets in quantitative research, as well as with more in-depth explanations of phenomena in qualitative research)." This Research Topic incorporated these directions well since it includes the following: a cross-cultural study (Soltwisch et al.); studies with sociological elements (Antončič and Auer Antončič; Bai et al.; Guo et al.; Qiu et al.); studies including intrapreneurship elements (Thomran et al.; Soltwisch et al.); studies with more comprehensive theoretical models (Antončič and Auer Antončič; Bergner et al.; Guo et al.; Heinemann at al.; Soltwisch et al.; Volery and Mattes); a case study (Bai et al.); and studies examining social (Bergner et al.; Soltwisch et al.) and serial (Bai et al.) entrepreneurial intentions.

The key personality correlates of entrepreneurship were summarized in past research (e.g., Antoncic, 2020): the Big Five personality factors, entrepreneurial self-efficacy, need for independence, risk-taking propensity, internal locus of control, and need for achievement. Most of these elements are included in this Research Topic, with the addition of other personality and non-personality correlates of entrepreneurship: (1) Volery and Mattes: the Big Five personality, education, necessity entrepreneurs, and self-employment survival/exit; (2) Antončič and Auer Antončič: all psychology correlates from Antoncic (2020), sociological elements (family business background, local business support background), and start-up intentions and actions; (3) Heinemann et al.: epistemic curiosity, openness to experience, entrepreneurial alertness, and entrepreneurship (intention and orientation); (4) Hamzah and Othman: internal locus of control, external locus of control, and entrepreneurial competency; (5) Qiu et al.: faultline configurations and the entrepreneurial team performance; (6) Thomran et al.: autonomy, risk-taking, proactiveness, innovativeness, competitive aggression, cost advantage, and differentiation advantage; (7) Guo et al.: improvisation, entrepreneurial self-efficacy, policy support for entrepreneurship, and entrepreneurial intention; (8) López-Núñez et al.: self-efficacy, emotional intelligence, the Big Five personality, and entrepreneurial intention; (9) Soltwisch et al.: decision styles, cultural orientation, entrepreneurial intention, and social entrepreneurial intention; (10) Bergner et al.: personality, cognition, entrepreneurial exposition, and social entrepreneurial intention; (11) Bai et al.: entrepreneurial expectations, identification and evaluation of opportunities, entrepreneurial failure learning, entrepreneurial cognitive schema, behavioral addiction tendency, emotional perception and motivation, entrepreneurial experience, environmental

TABLE 1 Top 30 publications in the Web of Science (sorted by the number of citations).

Rank	Title	References	Journal	Citations
1	Intrapreneurship: Construct refinement and cross-cultural validation	Antoncic and Hisrich, 2001	Journal of Business Venturing	581
2	Toward a model of venture capital-investment decision-making	Fried and Hisrich, 1994	Financial Management	324
3	Israeli women entrepreneurs: An examination of factors affecting performance	Lerner et al., 1997	Journal of Business Venturing	211
4	Entrepreneurship Intrapreneurship	Hisrich, 1990	American Psychologist	200
5	Entrepreneurship research and practice - A call to action for psychology	Hisrich et al., 2007	American Psychologist	174
6	Human capital and SME internationalization: A structural equation modeling study	Ruzzier et al., 2007b	Canadian Journal of Administrative Sciences -Revue Canadienne des sciences de l administration	154
7	The female entrepreneur - A career development perspective	Bowen and Hisrich, 1986	Academy of Management Review	153
8	The venture capitalist - A relationship investor	Fried and Hisrich, 1995	California Management Review	131
9	Strategy and the board of directors in venture capital-backed firms	Fried et al., 1998	Journal of Business Venturing	129
10	How venture capital firms differ	Elango et al., 1995	Journal of Business Venturing	119
11	Intuition in venture capital decisions – An exploratory-study using a new technique	Hisrich and Jankowicz, 1990	Journal of Business Venturing	104
12	Entrepreneurs' creativity and firm innovation: The moderating role of entrepreneurial self-efficacy	Ahlin et al., 2014a	Small Business Economics	93
13	Ethics and entrepreneurs - An international comparative study	Bucar et al., 2003	Journal of Business Venturing	85
14	Product innovation and firm performance in transition economies: A multi-stage estimation approach	Ramadani et al., 2019a	Technological Forecasting and Social Change	66
15	Entrepreneurship in the Soviet-union and post-socialist Russia	Ageev et al., 1995	Small Business Economics	48
16	Perceived risk in store selection	Hisrich et al., 1972	Journal of Marketing Research	42
17	Intrapreneurship strategy for internal markets–Corporate, non-profit and government institution cases	Nielsen et al., 1985	Strategic Management Journal	41
18	Tthe Russian entrepreneur	Hisrich and Grachev, 1993	Journal of Business Venturing	40
19	Beekeeping as a family artisan entrepreneurship business	Ramadani et al., 2019b	International Journal of Entrepreneurial Behavior and Research	30
20	Risk-taking propensity and entrepreneurship: The role of power distance	Auer Antoncic et al., 2018	Journal of Enterprising Culture	25
21	The internationalization of SMEs: Developing and testing a multi-dimensional measure on Slovenian firms	Ruzzier et al., 2007a	Entrepreneurship and Regional Development	25
22	Technological innovativeness and firm performance in Slovenia and Romania	Antoncic et al., 2007	Post-Communist Economies	24
23	Selecting superior segmentation correlate	Hisrich and Peters, 1974	Journal of Marketing	24
24	Entrepreneurial stressors as predictors of entrepreneurial burnout	Wei et al., 2015	Psychological Reports	19
25	Exploring the moderating effects of absorptive capacity on the relationship between social networks and innovation	Ahlin et al., 2014b	Journal of East-European Management Studies	18
26	Manufacturing entrepreneurs – An empirical-study of the correlates of employment growth in the Tulsa MSA and rural East Texas	Box et al., 1994	Journal of Business Venturing	17

(Continued)

TABLE 1 (Continued)

Rank	Title	References	Journal	Citations
27	Entrepreneurial openness: Concept development and measure validation	Slavec et al., 2017	European Management Journal	13
28	The mediating role of corporate entrepreneurship for externam environment effects on performance	Kearney et al., 2013	Journal of Business Economics and Management	13
29	New business formation through the enterprise development center - A model for new venture creation	Hisrich, 1988	IEEE Transactions on Engineering Management	11
30	Executive advertisers views on comparison advertising	Hisrich, 1983	Sloan Management Review	10

Source: Web of Science (2023).

TABLE 2 Impact–top 10 categories.

Rank	Category	Citations (impacted publications)	% of 2,130 citations
1	Business	1,096	51.5%
2	Management	894	42.0%
3	Economics	268	12.6%
4	Psychology applied	91	4.3%
5	Business finance	84	3.9%
6	Educational research	59	2.8%
7	Environmental studies	59	2.8%
8	Green sustainable science technology	57	2.7%
9	Environmental sciences	56	2.6%
10	Psychology multidisciplinary	54	2.5%

Source: Web of Science (2023).

conditions, financial conditions, demographic factors, and serial entrepreneurial intention.

Conclusion

Articles in this Research Topic—the Research Topic on *Psychological determinants of entrepreneurial intentions and behaviors*—have expanded the prior knowledge base about several psychological determinants of entrepreneurship and provided recommendations for research and practice.

Author contributions

BA and JA contributed to the conception and design of the article, wrote the first draft of the manuscript, and wrote all sections. Both authors contributed to the manuscript's revision and read and approved the submitted version.

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We are very grateful to our friend, mentor, and academic colleague Professor Robert D. Hisrich, Ph.D. (1944–2023).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Improvisation and university students' entrepreneurial intention in China: The roles of entrepreneurial self-efficacy and entrepreneurial policy support

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In the VUCA era, determining how to deal with environmental uncertainty has become one of the core issues. Research shows that improvisation is an effective way to deal with rapid changes and to obtain unexpected opportunities in a complex and changeable environment. Improvisation, as a needed capability in the entrepreneurial process, can also provide key strategies to effectively deal with emergencies. Although previous studies have explored the outcomes of improvisation in the entrepreneurial field, this paper aims to investigate in depth whether and how improvisation affects entrepreneurial intention in China. A moderated mediation model was constructed and tested using data from 251 Chinese university students to explore the influence mechanism of improvisation on entrepreneurial intention by combining social cognitive theory and the entrepreneurial event model. The results of this empirical analysis found that improvisation has a positive effect on entrepreneurial intention and entrepreneurial self-efficacy. Entrepreneurial self-efficacy plays a fully mediating role in the relationship between improvisation and entrepreneurial intention. Moreover, entrepreneurial policy support has been found to significantly moderate the mediated relationship between improvisation and entrepreneurial intention by entrepreneurial self-efficacy. The findings suggest that individuals should cultivate improvisation capabilities and entrepreneurial self-efficacy to enhance their entrepreneurial intention. They also need to pay attention to the dynamics of entrepreneurial policies in China. This study contributes to the extant literature by providing deeper insight into the relationship between improvisation and entrepreneurial intention and also has important practical implications for promoting entrepreneurial intention formation in contexts with environmental uncertainty like China.

KEYWORDS

improvisation, entrepreneurial self-efficacy, entrepreneurial intention, entrepreneurial policy support, China

Introduction

With the development of the economy, the expansion of universities and the negative impact of the Covid-19 pandemic, the employment situation of Chinese university graduates has become increasingly severe. University students are facing huge employment pressure. To alleviate this problem, the Chinese government encourages young people to start businesses and provides a large number of entrepreneurial preferential measures (Antoncic et al., 2015; He et al., 2019). However, entrepreneurship is a high-risk activity, and realistic factors, such as environmental uncertainty, resource scarcity, and information authenticity, make it difficult for university students to start a business (Fisher et al., 2021). University students' entrepreneurship is an entrepreneurial process with the special group of college students and graduate students as the main body. University students are the main force of entrepreneurship in China, and it is vital to understand how university students generate entrepreneurial behavior to encourage entrepreneurship (Rodriguez-Gutierrez et al., 2020; Sheng and Chen, 2022). Prior research has examined the drivers of entrepreneurship by examining why individuals form entrepreneurial intention (Cai et al., 2020b; Wang et al., 2021a). In China, the largest transitional economy, the business, institutional and technological environment is highly distinctive and complex compared to mature market economies (Yu et al., 2018). Improvisation is a combination of intuition, creativity and bricolage driven by time pressure, which can improve aspects of adaptation and become an important way to cope with uncertainty and the complex environment (Malucelli et al., 2021). Consequently, improvisation seems to be the most reasonable way to understand the formation of entrepreneurial intention in China. However, in view of the extant literature, only Hmieleski and Corbett (2006) point out that improvisational individuals tend to seek entrepreneurial opportunities and generate entrepreneurial intention based on the mature economies. We know little about whether and how improvisation has an influence on entrepreneurial intention in China.

Moreover, the impact of improvisation on entrepreneurial intention is not autonomous, and it occurs through certain mediating variables. Based on social cognitive theory, Pfitzner-Eden (2016) indicates that individuals form beliefs about self-efficacy by interpreting information about their capabilities (Bandura, 1997). Similarly, entrepreneurial self-efficacy, a belief that individuals can effectively complete entrepreneurial activities and achieve success (Antoncic et al., 2015, 2021; Hsu et al., 2019; Edwards et al., 2022), may be affected by their capabilities, such as improvisation. The entrepreneurial event model posits that entrepreneurial intention stems from the feasibility of entrepreneurship, the perception of feasible future states related to starting a business successfully, which is influenced directly by entrepreneurial self-efficacy (Esfandiar et al., 2019; Cai et al., 2020b; Antoncic et al., 2021; Rakib et al., 2022). It can be seen that improvisation affects entrepreneurial intention through the bridge of entrepreneurial self-efficacy. Furthermore, potential entrepreneurs in China are faced with more significant unprecedented uncertainty than those in developed countries given that they are in a critical period of transforming its development mode, optimizing its economic structure and transforming its growth drivers at this stage (Yu et al., 2018). To cope with such environmental turbulence, individuals need to seize fleeting entrepreneurial opportunities. The policy orientation boosts entrepreneurial behavior and guides national economic development. Therefore, the entrepreneurial policy support has critical moderating effects on individual entrepreneurial choices.

Numerous indicators show that over the past three decades, emerging markets have become increasingly important in the global economy (Yu et al., 2018, 2020; Grover Goswami et al., 2019). As the world's largest emerging economy, China's entrepreneurial environment is full of uncertainty and unpredictability (Liu and Almor, 2016). This means that huge changes in market demand and rapid technological innovation have made environmental uncertainty a key feature that must be considered in entrepreneurial activities. Improvisation can help individuals effectively address the challenges posed by such environmental uncertainties (Best and Gooderham, 2015). Thus, compared with U.S. or European markets, improvisation research is more meaningful in the Chinese context. In addition, due to the particularity of the Chinese system, the government's policy orientation has a substantial contingent impact on enterprises. Therefore, conducting this research in the context of China has important significance.

By integrating social cognitive theory and the entrepreneurial event model, we explore the influence mechanism of improvisation on entrepreneurial intention by examining the mediating role of entrepreneurial self-efficacy using data from China, the largest transitional economy. This study contributes to the extant literature in the following ways. First, it provides empirical evidence for the direct impact of improvisation on entrepreneurial self-efficacy and entrepreneurial intention in China's transition economy. Second, by exploring the mediating role of entrepreneurial self-efficacy, this paper opens the "black box" of the relationship between improvisation and entrepreneurial intention. Finally, it provides new insights into the relationship between entrepreneurial self-efficacy and entrepreneurial intention under high uncertainty by exploring the antecedent impact of improvisation and the moderating effect of the entrepreneurial policy support.

Theoretical background and conceptual model

Weick (1998) first introduced ideas that could improve organizational improvisation through descriptions of jazz improvisation. Magni et al. (2018) propose that improvisation is a process that can lead to personal gains or risks, and individual improvisation expresses a conscious choice that abandons established procedures to deal with emergencies (Leybourne and Sadler-Smith, 2006). When facing new problems or opportunities,

environmental uncertainty makes it difficult to plan or utilize trial and error. Heuristic thinking appears to be more efficient than systematic thinking. Improvisation seems to be one of the most important abilities that potential entrepreneurs need to have (Hmieleski and Corbett, 2006; Gojny-Zbierowska and Zbierowski, 2021). In summary, we draw on prior work to define improvisation as an individual's ability to use existing resources to achieve goals innovatively and spontaneously under tremendous pressure.

In social cognitive theory, triadic reciprocal causation is used to interpret psychosocial functioning. According to triadic reciprocal causation, behavioral, cognitive and other personal and environmental factors are the determinants of mutual influence (Wood and Bandura, 1989; Rakib et al., 2022). Entrepreneurial behavior is affected by cognitive and personal factors, such as entrepreneurial self-efficacy and personal capabilities (Bandura, 1977; Leybourne and Sadler-Smith, 2006; Antoncic et al., 2015; Schunk and DiBenedetto, 2020; Cai et al., 2020b). Improvisation as a personal capability allows individuals to seek opportunities to realize entrepreneurial behavior. Entrepreneurial intention is one of the most effective indicators of entrepreneurial behavior, which is usually defined as one's desire to start a business (Bae et al., 2014; Esfandiar et al., 2019; Douglas et al., 2021; Gojny-Zbierowska and Zbierowski, 2021). Therefore, improvisation is essential for generating entrepreneurial intention. Also, improvisation has an impact on entrepreneurial self-efficacy. Bandura (1997) proposes that individuals develop self-efficacy by interpreting information about their capabilities, such as mastery experiences, vicarious experiences, verbal persuasion and physiological and affective states, which are the authentic indicators of one's capabilities (Pfitzner-Eden, 2016). Having a functional coping ability undoubtedly contributes to a sense of personal efficacy (Bandura, 1977). Hence, improvisation is conducive to overcoming difficulties in entrepreneurship and enhancing entrepreneurial self-efficacy.

Moreover, the entrepreneurial event model demonstrates that entrepreneurial self-efficacy can impact entrepreneurial intention through entrepreneurial perceived feasibility (Bullough et al., 2014; Huang et al., 2021). Combined with social cognitive theory, entrepreneurial self-efficacy can be used as a pathway to explain the relationship between improvisation and entrepreneurial intention. Finally, contingency theory suggests that individuals' behavioral effects change under different situations (Harrison, 2018). Government policy, one of the critical environmental factors in entrepreneurship, has significant support and guidance effects (Wang et al., 2016). Thus, we introduce entrepreneurial policy support to explore the impact of cognition on individual behavior under different regional entrepreneurial policies.

Applying social cognitive theory and the entrepreneurial event model, we construct a well-suited framework to examine how improvisation impacts entrepreneurial intention using data from China, the largest transitional economy characterized by turbulence and changes. First, as shown in Figure 1, we examine the effect of improvisation on

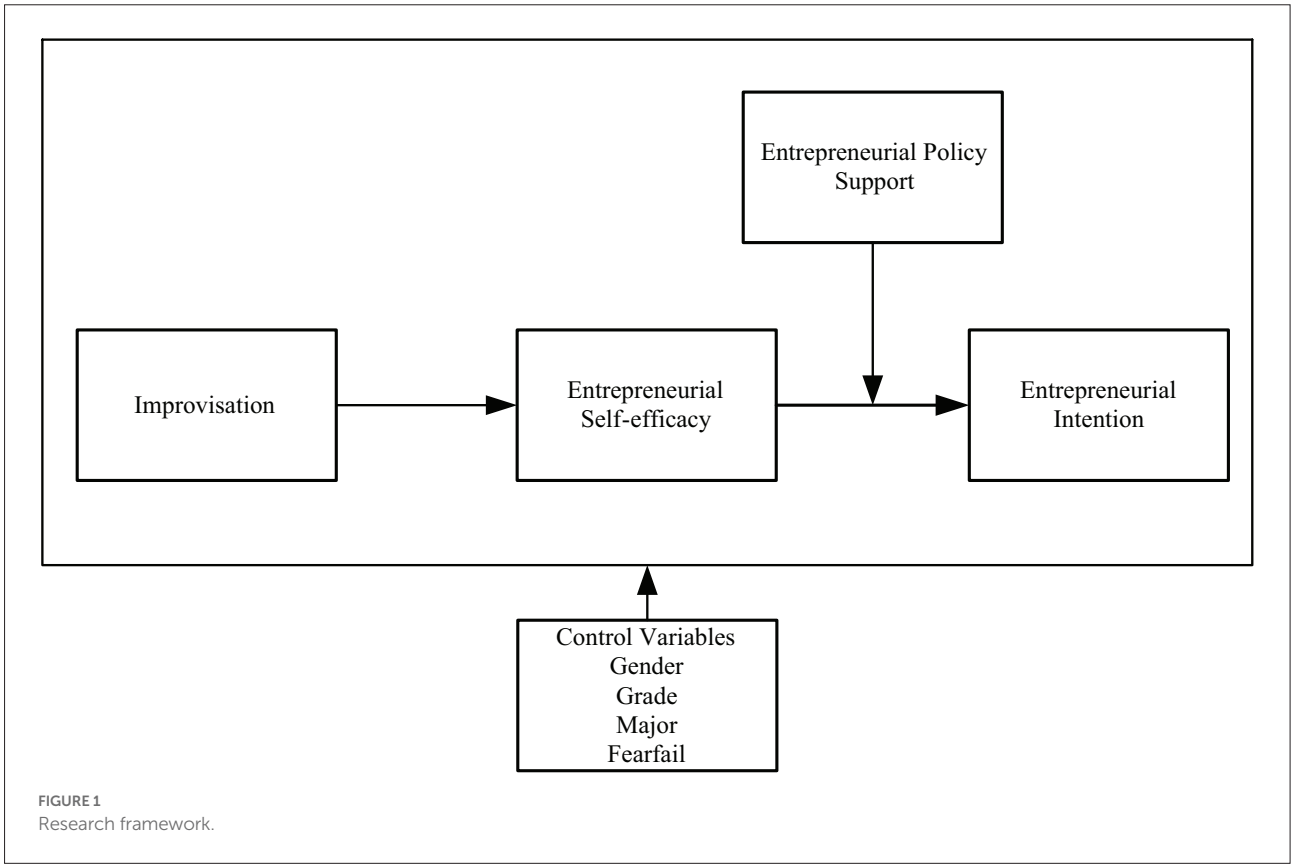

FIGURE 1
Research framework.

entrepreneurial intention and entrepreneurial self-efficacy. Second, we examine the mediating role of entrepreneurial self-efficacy in the relationship between improvisation and entrepreneurial intention. Finally, we discuss the moderating role of entrepreneurial policy support (Figure 1).

Hypothesis

Improvisation and entrepreneurial intention

Improvisation consists of three dimensions: (1) creativity and bricolage, (2) the ability to function and excel under pressure-filled and stressful environments and (3) spontaneity and persistence (Hmieleski and Corbett, 2006). In general, improvisation focuses on using existing resources to spontaneously and creatively seize opportunities and achieve goals under time pressure and risk. According to social cognitive theory, improvisation is the core element of entrepreneurial motivation and the key to explaining entrepreneurial intention.

Specifically, as a dimension of improvisation, creativity and bricolage refer to the ability to creatively recombine available resources under the condition of resource constraints in entrepreneurial activities. Creativity and bricolage enable individuals to integrate and recompose limited resources in time, generate novel and valuable solutions and grasp fleeting entrepreneurial opportunities to facilitate entrepreneurial behavior in a resource-constrained environment (Vera and Crossan, 2005; Kumar and Shukla, 2022). Creativity is commonly associated with creative and innovative ideas for starting a new business (Cai et al., 2020a; Murad et al., 2021; Wang et al., 2021a). Duckworth et al. (2016) found a direct and positive relationship between creativity and entrepreneurial intentions. Murad et al. (2021) suggested that creativity is suitable for considering entrepreneurship as a career option and essential for initiating the entrepreneurial process, which leads to the design of new products. Therefore, creative individuals are more inclined to launch their own firms. Moreover, the research of Liu and Zhou (2020) research shows that bricolage can maximize the value of resources and encourage individuals to seize business opportunities and participate in business activities. In the entrepreneurial processes, predetermined preparations do not always work well, so creativity and bricolage are particularly essential to sense entrepreneurial opportunities and increase entrepreneurial intention.

In addition, Duxbury (2014) argues that time pressure is another crucial element implicit in improvisation. With increasing market competition and the acceleration of technological innovation, individuals do not have enough time to conduct detailed market research and need to rely on their intuition to make decisions and implement them quickly. Duxbury (2014) as a result, given the enormous pressure, the ability to function in stressful environments is critical to capturing unpredictable opportunities and realizing entrepreneurial behavior.

Furthermore, spontaneity and persistence—another dimension of improvisation—represent individuals' action orientation and determination to achieve goals and solve problems (Hmieleski and Corbett, 2006, 2008). This dimension emphasizes the simultaneous occurrence of composition and implementation; in the face of emergencies, the time interval between planning and execution is almost the same. Individuals who are high in this dimension tend to prefer action rather than analysis and are highly concerned with the problem at hand (Vera and Crossan, 2005). Spontaneity and persistence allow individuals to identify entrepreneurial opportunities, integrate existing resources and adhere to their targets through actions.

Accordingly, in the Chinese context, with high uncertainty brought about by rapid technological and market changes, improvisation allows individuals to perceive and respond to environmental changes and spontaneously and creatively recombine the resources at hand. Improvisational individuals are more inclined to shape and seize entrepreneurial opportunities to increase their entrepreneurial intention. Thus, we propose the following:

> *H1*: Improvisation is positively related to entrepreneurial intention.

Improvisation and entrepreneurial self-efficacy

According to social cognitive theory, information about people's capabilities has an impact on self-efficacy. Individuals with the ability to cope in emergency circumstances undoubtedly have a high perception of efficacy (Bandura, 1977). Therefore, improvisation enhances the advantages of survival and improves entrepreneurial self-efficacy.

As an essential element of improvisation, creativity and bricolage may have an impact on entrepreneurial self-efficacy. The creative use of resources at hand is often related to problem solving (Hansen et al., 2011; Antoncic et al., 2018). In a challenging environment, people are often determined to use various methods of overcoming obstacles and solving problems (Zhou et al., 2012). As such, successful problem solving can improve self-perception, leading one to engage in more challenging behaviors and tasks. Biraglia and Kadile (2017) show that the ideas generated by individuals using creativity can foster their self-confidence to perform related activities in a specific field. Sun et al. (2020) argue that resource bricolage enables individuals to find undiscovered entrepreneurial opportunities, which increases their confidence in entrepreneurship when facing more substantial resource constraints. Therefore, individuals with high creativity and bricolage are more convinced that they have entrepreneurial self-efficacy.

In addition, improvisational capabilities are critical in pressure-filled and stressful environments. People constantly face a lot of pressure when starting a business, for example, time pressure, role conflicts, and coping with past failures (Duxbury, 2014; Wei et al., 2015; Schmutzler et al., 2019). Differing sources

of pressure cause potential entrepreneurs to doubt their entrepreneurial abilities. Klassen et al. (2013) show that developing teachers' capabilities in managing overall work stress builds self-efficacy. When faced with risk and uncertainty in entrepreneurship, if potential entrepreneurs can overcome tremendous pressures and develop positive attitudes, they will gain more confidence in starting a business.

The opportunities in the entrepreneurial process are always "written in water" and require that individuals with improvisational capabilities, such as spontaneity and persistence, seize them. Adomako et al. (2016) state that opportunities are often fleeting and cannot be easily predicted. Individuals are required to react spontaneously instead of preparing for unknown situations (Vera and Crossan, 2005). In addition, resilient individuals are more inclined to follow the entrepreneurial path they chose and take actions to achieve goals (Gompers et al., 2010). Therefore, individuals who can respond spontaneously and pursue their goals persistently may have a greater chance of success, increasing entrepreneurial confidence.

In China, entrepreneurial practices have undergone significant transformations due to emerging technology and market changes. When faced with new complex problems in entrepreneurship, most individuals lack the available methods for reference or imitation (Hmieleski and Corbett, 2008; Bresman, 2010), leading to doubt and anxiety about one's entrepreneurial choices. Improvisation forms a new source of emotional security in entrepreneurship to creatively identify practical solutions even if someone has insufficient experience, particularly enhancing entrepreneurial confidence. Therefore, to enhance entrepreneurial self-efficacy, we need to emphasize the role of improvisation. Thus, we propose:

> *H2*: Improvisation is positively related to entrepreneurial self-efficacy.

The mediating role of entrepreneurial self-efficacy in the relationship between improvisation and entrepreneurial intention

In light of the entrepreneurial event model, entrepreneurial self-efficacy is a prerequisite for entrepreneurial intention and behavior (Esfandiar et al., 2019; Cai et al., 2020b; Antoncic et al., 2021; Rakib et al., 2022). The entrepreneurial event model posits that perceptions of feasibility are directly influenced by self-efficacy. Feasibility can increase the propensity to take entrepreneurial actions and contribute to the entrepreneurial process by identifying and recognizing credible new entrepreneurial opportunities (Bullough et al., 2014). Entrepreneurial self-efficacy helps individuals generate entrepreneurial intention under the premise of high feasibility. The mediating role of entrepreneurial self-efficacy mainly focuses on the relationship between personality, risk propensity and entrepreneurial intention (Mei et al., 2017; Gu et al., 2018). However, there is no detailed explanation of the impact of improvisation on entrepreneurial intention *via* entrepreneurial self-efficacy.

Individuals often need to assess the uncertain external environment and relevant tasks when realizing their entrepreneurial ideas in China (Yu et al., 2018). Improvisation precisely offers them the confidence and courage to cope with unpredictability, enhance subjective initiatives and develop more preferences to generate entrepreneurial ideas (Magni et al., 2009). The achievement brought about through improvisation is an essential manifestation of examining whether participating in entrepreneurship is suitable. Individuals with improvisational capabilities are more inclined to adopt heuristic thinking (Hmieleski and Corbett, 2006; Leybourne and Sadler-Smith, 2006; Biraglia and Kadile, 2017). This kind of thinking helps people creatively use the resources at hand to generate innovative ideas and solutions to problems under time pressure and resource shortages. The achievement due to improvisation allows individuals to believe they can play a role in the entrepreneurial process, effectively enhancing entrepreneurial confidence and better perceiving entrepreneurial self-efficacy. Strong entrepreneurial self-efficacy has a promoting effect on the perception of entrepreneurial feasibility and makes them believe that they are capable of playing the role of an entrepreneur to show a significant predisposition toward nurturing entrepreneurial intention. Based on the above theories and analysis, we suggest that entrepreneurial self-efficacy plays a mediating role between improvisation and entrepreneurial intention. Thus, we propose:

> *H3*: The relationship between improvisation and entrepreneurial intention is mediated by entrepreneurial self-efficacy.

Moderated-mediation effect of entrepreneurial policy support

According to contingency theory, the external environment is a vital factor guiding individual behavior. Specifically, in a favorable situation, it is easier for an individual to achieve his or her established goals (Harrison, 2018). In China, with the development of entrepreneurial policies, improvisation may be more effective for enhancing entrepreneurial intention by entrepreneurial self-efficacy. Currently, the Chinese government is vigorously developing infrastructure construction and providing government incubators and venture capital-guided funds, which have effectively lowered the threshold for entrepreneurship, provided better entrepreneurial resources for individuals, enabling them to better display improvisational capabilities, enhanced entrepreneurial confidence and the feasibility of entrepreneurship (Korsching et al., 2001; Lan et al., 2018). With the support of entrepreneurial policies, improvisational ability is more easily transformed into entrepreneurial intention through entrepreneurial self-efficacy. The entrepreneurial policy support

positively moderates the indirect relationship between improvisation and entrepreneurial intention through entrepreneurial self-efficacy. Thus, we propose:

> *H4*: Entrepreneurial policy support moderates the relationship between entrepreneurial self-efficacy and entrepreneurial intention.

Materials and methods

Sampling and data collection

Some scholars advocate that the study of entrepreneurial intention should be conducted in the early stages of individual development. For example, research on the entrepreneurial intention of university students who have not yet started their careers can obtain a forward-looking perspective that avoids retrospective bias (Carter et al., 2003). In addition, university students are a relatively homogeneous group, which can effectively reduce the influence of individual differences on the research results and help understand the formation mechanism of entrepreneurial intention (Malebana, 2017). Data for this study were obtained through a questionnaire-based survey instrument implemented in China. According to the 2018 China Mass Entrepreneurship Index Report released by the Innovation and Entrepreneurship Research Center of Southwest Jiaotong University, we divide the regions into upstream and downstream regions. The report has now become an index monitoring system to observe the basic trend and entrepreneurial performance of "mass entrepreneurship and innovation" in China. To ensure the validity and generality of our results, we collected data from July to September 2018 from these regions as our survey locations: upstream regions, such as Jiangsu Province, Guangdong Province, Shanghai and Beijing, and downstream regions, such as Jilin Province and the Inner Mongolia Autonomous Region. A total of 450 questionnaires were distributed randomly, and 330 were returned. After excluding invalid questionnaires (with incomplete or inconsistent answers), we retained 251 valid questionnaires. To test non-response bias, we compared the early and late responses based on the assumption that the opinions of the late responses represented the opinions of non-respondents (Armstrong and Overton, 1977). Concerning entrepreneurial intention, the results of the *t*-test yielded no statistically significant differences between the early and late responses. Therefore, non-response bias does not seem to be a concern.

Questionnaire and measures

We developed a questionnaire based on the theoretical literature widely cited. The questionnaire was first written in English and was then translated into Chinese according to the standard method of back-translation. Subsequently, the Chinese version was translated back into English by a third party for comparison with the first English version. This process was repeated until the two versions showed little substantive differences. After the translation, we sent the questionnaire to three professors to review, and then we revised it based on their suggestions. Next, a pilot test was conducted with 50 university students until no new feedback was received; we revised the questionnaire further based on the pilot study. To ensure the accuracy of the data, respondents received proper training before taking the survey.

All items are measured using five-point Likert-type scales drawn from the literature. University students were asked to score these constructs according to their views on the items, measuring them on a scale of 1 (strongly disagree) to 5 (strongly agree). The selected items measuring improvisation were proposed by Hmieleski and Corbett (2006). After the pilot test, we found many items on the scale led to inaccurate measurement so we deleted those with vague wordings and combined those with high similarity, eventually resulting in 13 items. Improvisation includes three dimensions: (1) creativity and bricolage, (2) the ability to function and excel under pressure-filled and stressful environments and (3) spontaneity and persistence. In this research, we consider improvisation to be a combination of these elements. We aggregated all items evaluating dimensions of improvisation to measure it completely. The scale developed by Forbes (2005) was adapted for use in this study to be suitable for China's national conditions. We selected a seven-item scale related to entrepreneurial self-efficacy after combining similar items from the same domain. The five-item scale measuring entrepreneurial intention was selected based on Liñán and Chen's (2009) scale in the literature. According to the global entrepreneurship monitor (2006), the measurement scale of the entrepreneurial policy support was constructed using a four-item scale. The GEM (2006) report points out that governments have an important role in encouraging entrepreneurial activity. The creation of institutions conducive to entrepreneurial activity, such as respect and enforcement of the rules of law, legal and financial transparency and a fair, competitive environment, is the fundamental responsibility of government (Bosma and Harding, 2006). In addition to these general principles, the entrepreneurial policy support in our study is at the regional level instead of the national level. As each region is at a different stage of development and faces different opportunities, effective policies for entrepreneurship need to be tailored to the local context (He et al., 2019). Thus, the entrepreneurial policy support was assessed from four aspects: preferential tax policies, registration and approval procedures, consulting services and local policies and regulations. The coefficient alphas of all variables are above 0.90. These results suggest that the theoretical constructs exhibit high reliability. This study also includes controls for several variables that might affect the hypothesized relationships, including demographic variables, such as gender, grade and major, studied in past research (Zhang et al., 2014; Piperopoulos and Dimov, 2015). Gender is a dummy variable, with a value of "1" assigned for male and a "0" assigned for female. Major is a dummy variable, with engineering assigned a value of "1" and others assigned a "0," and management is assigned a value of "1" and others are "0." In addition, a lower fear of failure is conducive to increasing entrepreneurial activities (Schmutzler et al., 2019). Therefore, "fear of failure would prevent individuals from starting a new business" (Fearfail) is also set as a control variable. "Fear of

failure" includes a dummy variable with "1" representing when the fear of failure prevents an individual from starting a new business and "0," otherwise.

Results

Measurement model

Following guidelines from Anderson and Gerbing (1988), a measurement model must be tested before evaluating the conceptual model. Exploratory factor analysis (EFA) with SPSS 22.0 software was used to identify underlying constructs. Principal axis factoring was carried out, followed by varimax rotation with Kaiser Normalization. Only factors with eigenvalues of more than one have been retained. All factors with eigenvalues less than one were considered insignificant and hence dropped. A total of four factors with eigenvalues greater than one were identified, which cumulatively explain 65.825 percent of the total variance of the data, namely, improvisation (factor 1), entrepreneurial self-efficacy (factor 2), entrepreneurial intention (factor 3) and entrepreneurial policy support (factor 4). All items used in the constructs are presented in Table 1. We then used a confirmatory

TABLE 1 | Factor loadings, Cronbach's alpha, AVE and CR.

Four Factors and Scale Items	Factor Loading	Cronbach's Alpha	AVE	CR
Improvisation		0.929	0.509	0.930
Indicate your level of agreement with the following statements				
1. I serve as a good role model for creativity	0.741			
2. I demonstrate originality in my work	0.781			
3. I take risks in terms of producing new ideas in completing projects	0.790			
4. I think outside of the box	0.773			
5. I identify opportunities for new services/ products	0.775			
6. I find new uses for existing methods or equipment	0.750			
7. I identify ways in which resources can be recombined to produce novel products	0.817			
8. I perform better under time pressure	0.702			
9. I need pressure in order to focus	0.662			
10. I "think on my feet" when carrying out actions	0.755			
11. I respond to problems in a "spur of the moment" way	0.594			
12. I am a persistent person	0.534			
13. I don't let past failures hinder future performance	0.522			
ESE		0.913	0.605	0.914
To what extent do you agree with the following statements regarding your degree of certainty in your ability to perform entrepreneurial-related task				
14. Conduct market analysis	0.746			
15. Develop new markets	0.819			
16. Develop new products and services	0.772			
17. Conduct strategic planning	0.828			
18. Reduce risk and uncertainty	0.809			
19. Take calculated risks	0.796			
20. Perform financial analysis	0.662			
EI		0.934	0.740	0.934
Indicate your level of agreement with the following statements				
21. My professional goal is to become an entrepreneur	0.849			
22. I will make every effort to start and run my own firm	0.886			
23. I am determined to create a firm in the future	0.906			
24. I have very seriously thought of starting a firm	0.797			
25. I have the firm intention to start a firm some day	0.860			
EPS		0.901	0.695	0.901
Indicate your level of agreement with the following statements				
26. The government provides many preferential tax policies for entrepreneurship	0.840			
27. The registration and approval procedures of enterprises are simplified and convenient	0.785			
28. The government provides many consulting services for entrepreneurship	0.860			
29. The local government performed well in normalizing the policies and laws related entrepreneurship	0.848			

Note: CR: Composite reliability; AVE: Average variance extracted.

factor analysis (CFA) with AMOS 22.0 software involving these four constructs. The measurement model provides a good fit to the data: $\chi^2(371) = 836.444$, $p < 0.001$, $\chi^2/df = 2.255$, RMSEA = 0.071, SRMR = 0.050, CFI = 0.909, IFI = 0.910, TLI = 0.901. LO-HI intervals for RMSEA are 0.064–0.077 within the acceptable range (Schreiber et al., 2006). Compared with three-factor, two-factor and one-factor alternative models, the results in Table 2 show that the four-factor model fits well. In addition, all fit indicators meet the required standards. Therefore, these items were retained; the factor loadings are presented in Table 1. Straub (1989) proposes that 0.5 is the cutoff level of the factor loadings of selected measures. Typically, loadings of 0.5 or greater are considered significant (Terziovski, 2010; Gunawan and Huarng, 2015; Lioukas and Reuer, 2015; Peña Häufler et al., 2021; Song et al., 2021; Wang et al., 2021b). The loadings of all items are basically greater than 0.7 and exceed 0.5, which shows adequate convergent validity.

Table 1 demonstrates the average variance extracted (AVE) and composite reliability (CR). All AVE values exceed the 0.5 threshold (Fornell and Larcker, 1981), and all CR values are greater than the 0.7 critical value (Bagozzi and Yi, 2012). Table 3 displays the descriptive statistics and correlations in this study. Consistent with the theoretical logic we proposed, improvisation is positively associated with entrepreneurial self-efficacy and entrepreneurial intention. Entrepreneurial self-efficacy is positively associated with entrepreneurial intention. We also calculated the square root of AVE for each construct as shown in the diagonal elements of Table 3. The results demonstrate that the square root of AVE is greater than the correlations in the corresponding rows and columns, indicating good discriminant validity (Fornell and Larcker, 1981).

Common method variance (CMV) is generated when all variables are simultaneously measured using a single instrument (Malhotra et al., 2017). To avoid CMV as much as possible, we adopt procedural and statistical controls. The procedural techniques include protecting respondents' anonymity, placing the constructs in different sections and improving scale items to reduce ambiguity. Concerning statistical techniques, Harmon's single-factor model was tested by applying a CFA to reveal that the model fit the data poorly: $\chi^2(377) = 2559.496$, $p < 0.001$, $\chi^2/df = 6.789$, RMSEA = 0.152, SRMR = 0.126, CFI = 0.574, IFI = 0.577, TLI = 0.542. It indicates that the single-factor model is unacceptable, and CMV is unlikely to affect the results of this study (Tables 1-3).

TABLE 2 | Confirmatory factor analysis.

Model	χ^2/d.f.	TLI	IFI	CFI	RMSEA	SRMR
4-factor model	2.255	0.901	0.910	0.909	0.071	0.050
3-factor model[1]	3.692	0.787	0.805	0.804	0.104	0.086
2-factor model[2]	5.369	0.654	0.681	0.680	0.132	0.106
1-factor model[3]	6.789	0.542	0.577	0.574	0.152	0.126

Note: n=251; [1]Combines improvisation and entrepreneurial self-efficacy into potential factors; [2]Combines improvisation and entrepreneurial self-efficacy and entrepreneurial intention into potential factors; [3]Combines all variables into one variable.

Mediating effect testing

After estimating the CFA model, we first used regression analysis with SPSS 22.0 software for evaluating H1 and H2, and then used structural equation modeling (SEM) with AMOS 22.0 software for evaluating the mediation analysis, not including the moderation effect. First, we found that H1 was supported by a regression analysis on the effect of improvisation on entrepreneurial intention ($\beta = 0.434$, $p < 0.001$). Second, we found that H2 was supported by a regression analysis on the effect of improvisation on entrepreneurial self-efficacy ($\beta = 0.567$, $p < 0.001$). Third, we adopted a SEM for testing H3. Figure 2 and Table 4 present the results of the SEM as well as the estimated effects, which provide a good model fit: $\chi^2(382) = 836.584$, $p < 0.001$, $\chi^2/df = 2.190$, RMSEA = 0.069, SRMR = 0.051, CFI = 0.901, and IFI = 0.902. As illustrated in the model, improvisation is positively and significantly related to entrepreneurial self-efficacy ($\beta = 0.664$, $p < 0.001$). Further, entrepreneurial self-efficacy is positively and significantly related to entrepreneurial intention ($\beta = 0.632$, $p < 0.001$). Improvisation does not have a significant impact on entrepreneurial intention ($\beta = 0.101$, $p > 0.05$). Therefore, entrepreneurial self-efficacy plays

TABLE 3 | Variables mean, standard deviation and correlations.

Factors	Mean	SD	1	2	3	4	5	6	7	8	9
Gender	1.460	0.499	1.000								
Grade	2.430	0.862	0.056	1.000							
Engineering	0.371	0.484	−0.275**	0.054	1.000						
Management	0.251	0.434	0.279**	−0.036	−0.444**	1.000					
Fearfail	1.310	0.462	−0.161*	−0.115	−0.045	0.033	1.000				
EPS	3.075	0.848	−0.017	0.033	0.032	−0.008	0.158*	0.834			
Improvisation	3.270	0.607	−0.167**	−0.102	−0.009	−0.035	0.260**	0.407**	0.713		
ESE	3.239	0.680	−0.214**	−0.095	−0.026	0.000	0.272**	0.246**	0.614**	0.778	
EI	2.943	0.875	−0.235**	−0.042	0.059	−0.059	0.182**	0.078	0.470**	0.646**	0.860

Note: n=251; *$p \leq 0.05$, **$p \leq 0.01$; ***$p \leq 0.001$.

TABLE 4 | Mediation model test.

Path	β	S.E	C.R	p
Gender⇒ EI	−0.076	0.075	−1.667	0.095
Grade⇒ EI	0.050	0.140	0.586	0.558
Engineering⇒ EI	0.014	0.096	0.293	0.769
Management⇒ EI	−0.036	0.050	−2.852	0.004
Fearfail⇒ EI	−0.026	0.163	−0.425	0.671
Improvisation⇒ ESE	0.664	0.075	8.824	0.000
ESE⇒ EI	0.632	0.114	7.572	0.000
Improvisation⇒ EI	0.101	0.103	1.327	0.184

Note: n=251; β = Coefficient estimates; S.E = Standard error; C.R = Critical ratio; p = Level of significance.

a fully mediating role between improvisation and entrepreneurial intention, supporting H3. In addition, this paper also used SPSS 22.0 software to examine whether there are differences in the results for different regions. The significance levels of different regions are basically the same, so the regions do not lead to significant differences in the formation of entrepreneurial intentions. In downstream regions (N = 136), improvisation is positively and significantly related to entrepreneurial intention (β = 0.434, p < 0.001) and entrepreneurial self-efficacy (β = 0.612, p < 0.001). Entrepreneurial self-efficacy plays a mediating role between improvisation and entrepreneurial intention (β = 0.566, p < 0.001). In upstream regions (N = 115), improvisation is positively and significantly related to entrepreneurial intention (β = 0.468, p < 0.001) and entrepreneurial self-efficacy (β = 0.482, p < 0.001). Entrepreneurial self-efficacy plays a mediating role between improvisation and entrepreneurial intention (β = 0.560, p < 0.001) (Table 4, Figure 2).

Moderated mediation effect testing

After testing the mediation analysis, we used the bootstrap method with the SPSS process for evaluating H4. H4 suggests that entrepreneurial policy support interacts with entrepreneurial self-efficacy to impact entrepreneurial intention. A moderated mediation analysis is appropriate for testing the effects (Hayes, 2017). To test the moderated mediation model relationship provided four requirements without obtaining this moderated mediation do not exist. The suggestions are following, (a) the relationship between exogenous and endogenous should significant; (b) the interaction of moderator and mediator on endogenous should significant; (c) the relationship between the mediator and the endogenous variable should be significant; (d) the degree of conditional indirect effect has to be different at low, medium and high levels for moderator (Wang et al., 2021a). To test the conditional indirect effect through H4, Table 5 shows that (β = 0.234, t = 2.531, p < 0.05) significant relationship between improvisation and entrepreneurial intention and met with the condition (a). The interaction effect (β = 0.121, t = 2.111, p < 0.05) between entrepreneurial self-efficacy and entrepreneurial policy support is also significant that satisfies the condition (b). Table 3 shows that entrepreneurial self-efficacy has a direct positive and significant effect on entrepreneurial intention (β = 0.735, t = 9.347, p < 0.001) that met the condition criteria (c). Table 6 shows that the conditional indirect effect of improvisation on entrepreneurial intention through entrepreneurial self-efficacy (β = 0.838, p = 0.652; 1.025) that is positive and significant for high levels of entrepreneurial policy support (+1sd), and (β = 0.735, p = 0.580; 0.890) is also positive and significant for medium levels of entrepreneurial policy support (0) and (β = 0.633, p = 0.455; 0.811) is also a positive sign for low levels (−1sd) of entrepreneurial policy support but the degree of conditional indirect effect is different at low, medium and high levels for entrepreneurial policy support and accord with the condition (d). Thus, there is a conditional indirect effect of improvisation on entrepreneurial intention through entrepreneurial self-efficacy, supporting H4. We also found there is some differences in the level for entrepreneurial policy support. With low levels for entrepreneurial policy support, entrepreneurial self-efficacy has a significant positive effect on entrepreneurial intention, and with high levels of entrepreneurial policy support, although entrepreneurial self-efficacy also has a significant positive effect on entrepreneurial intention, and has more intense influence, indicating that with the increase of levels of entrepreneurial policy support, the effect of entrepreneurial self-efficacy on entrepreneurial intention is gradually increasing. In addition, at the three levels of entrepreneurial policy support, the mediating effect of entrepreneurial self-efficacy in the relationship between improvisation and entrepreneurial intention also showed an increasing trend. That is to say, with the improvement of the level of entrepreneurial policy support, the individual's improvisational ability is more likely to enhance his entrepreneurial intention by improving entrepreneurial self-efficacy (Tables 5, 6).

Discussion and implications

Discussion

On the basis of social cognitive theory and the entrepreneurial event model, this article explores the influencing mechanism of improvisation on entrepreneurial intention in China's transition economy and investigates the mediating role of entrepreneurial self-efficacy and the moderating role of entrepreneurial policy support in this relationship. Combining the theoretical research with the empirical study of data obtained *via* questionnaires, we find that improvisation has a positive effect on entrepreneurial intention and entrepreneurial self-efficacy and this relationship can be transmitted through the continuous mediating role of entrepreneurial self-efficacy and the moderating role of entrepreneurial policy support. Overall, this research initially improves the relationship between improvisation and entrepreneurial intention and introduces entrepreneurial

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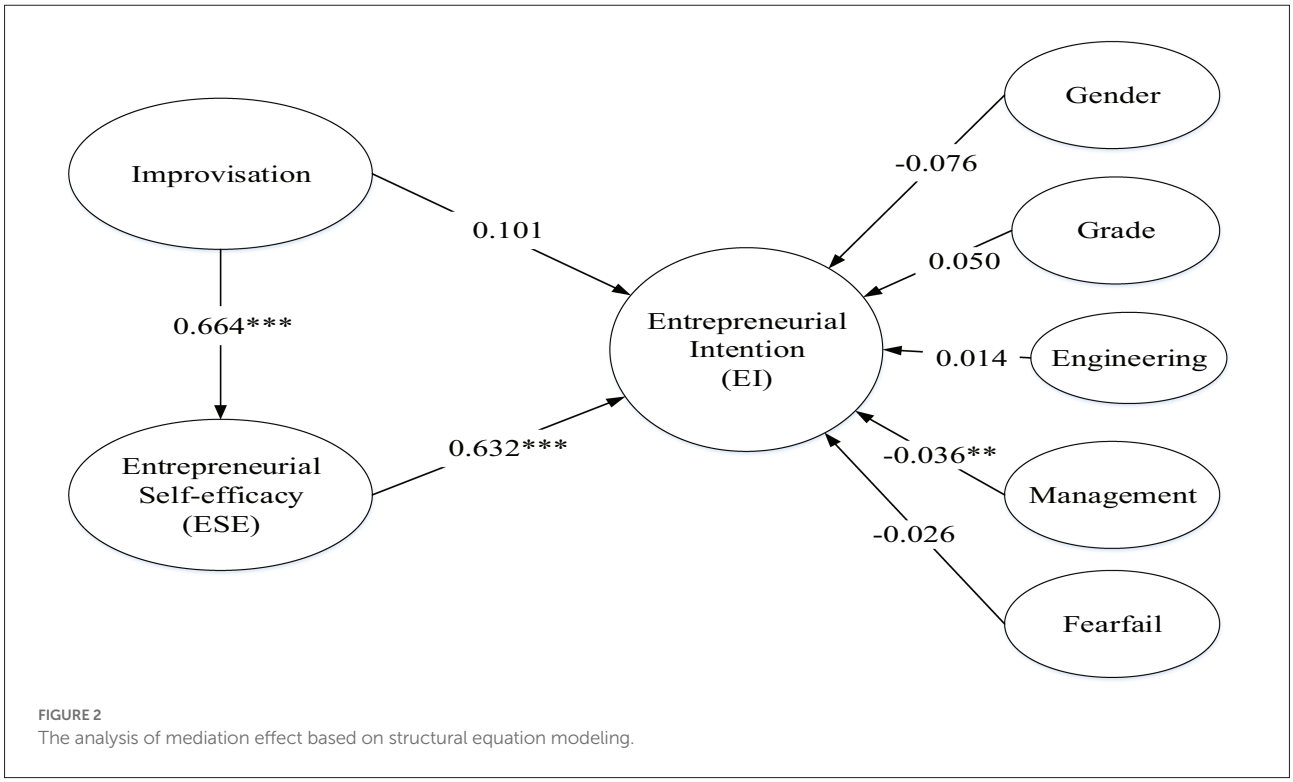

FIGURE 2
The analysis of mediation effect based on structural equation modeling.

TABLE 5 | Direct, indirect and conditional effects.

Paths	β	S.E	*t*-Value	*p*	Bias-corrected Percentile 95% CI	
					Lower	Upper
X→Y	0.234	0.092	2.531	0.012	0.052	0.416
X→M	0.635	0.058	10.928	***	0.521	0.750
M→Y	0.735	0.079	9.347	***	0.580	0.890
M×W→Y	0.121	0.057	2.111	0.036	0.008	0.234
Controls						
Gender→Y	−0.103	0.092	−1.118	0.265	−0.284	0.078
Grade→Y	0.033	0.049	0.67	0.504	−0.063	0.129
Engineering→Y	−0.103	0.097	0.977	0.330	−0.097	0.287
Management→Y	−0.016	0.108	−0.15	0.881	−0.229	0.197
Fearfail→Y	0.012	0.095	0.129	0.897	−0.175	0.200

Note: n=251; X=Improvisation; M=Entrepreneurial self-efficacy; Y=Entrepreneurial intention; W=Entrepreneurial policy support; β = Coefficient Estimates; S.E=Standard error; p = Level of significance; Bootstrapping=5000; CI=Confidence of interval 95%; *$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$.

self-efficacy and entrepreneurial policy support to open the "black box" in transitional economies, such as China, with high environmental uncertainty.

Concerning H1, it was predicted that improvisation is positively related to entrepreneurial intention, and this is accepted. Our empirical research results are parallel with Hmieleski and Corbett's (2006) study of mature economies showing that improvisation has a positive relationship with entrepreneurial intention, which means that in both mature and transitional economies, improvisation can effectively promote entrepreneurial intention. When resource limitations are prohibitive and an individual is confronted with a novel entrepreneurial problem or opportunity, improvisation appears to be the most reasonable course of action. Individuals with a propensity for improvisation display a tendency toward self-selecting themselves into the field of entrepreneurship.

Regarding H2, it was predicted that improvisation significantly influences entrepreneurial self-efficacy, which is supported. Entrepreneurial self-efficacy has been recognized in relation to improvisation in terms of opportunity development, creativity and idea generation (Hmieleski and Corbett, 2008). This finding is similar to the recent studies of Balachandra (2019); which

TABLE 6 | Conditional indirect effect of improvisation on entrepreneurial intention through entrepreneurial self-efficacy.

	β	S.E	Percentile 95% CI		*p*
			Lower Bound	Upper Bound	
The conditional indirect effect at high, medium and low entrepreneurial policy support					
Low (-1sd) entrepreneurial policy support	0.633	0.090	0.455	0.811	***
Medium (0) entrepreneurial policy support	0.735	0.079	0.580	0.890	***
High (+1sd) entrepreneurial policy support	0.838	0.095	0.652	1.025	***

Note: Bootstrapping sample size = 5000; β = Coefficient estimates; $^{**}p \leq 0.05$; $^{**}p \leq 0.01$; $^{***}p \leq 0.001$.

indicated that improvisation can promote an entrepreneurial mindset. The entrepreneurial mindset is founded on entrepreneurial self-efficacy, which is a broader definition of self-efficacy that encompasses the entire process of beginning a firm, allowing individuals to recognize their ability to adapt and/or act in crucial moments.

In H3, it was proposed that entrepreneurial self-efficacy has a mediating effect in the relationship between improvisation and entrepreneurial intention, which is accepted. This finding is similar to previous research (Mei et al., 2017; Gu et al., 2018; Cai et al., 2020b). People with high self-efficacy tend to have more entrepreneurial intentions. Individuals with high levels of improvisation tend to be more comfortable dealing with situations of uncertainty and risk and, in fact, perceive the objectively same situation as less risky than others. Consequently, they are more likely to anticipate experiencing less anxiety about an entrepreneurial opportunity, to perceive a greater sense of control over outcomes, and to judge the likelihood of receiving positive rewards as being greater, all of which are associated with higher levels of entrepreneurial self-efficacy.

Discussing H4, we found that entrepreneurial policy support moderates the mediated relationship between improvisation and entrepreneurial intention by entrepreneurial self-efficacy. This result is consistent with earlier studies (Schmutzler et al., 2019; Neneh, 2022). While most people will analyze whether they have the requisite skills to start a business before opting to do so, it is also well-known that an entrepreneurial career is fraught with risk and challenges. Given the dangers and uncertainty inherent in an entrepreneurial career, entrepreneurial policy support allows individuals to leverage their improvisational ability to form their entrepreneurial intentions. Such entrepreneurial policy support results in a supply of financial and instrumental assistance, which encourages the development of entrepreneurial intentions in the face of uncertainty.

Theoretical implications

Our research contributes to the existing theoretical literature in several ways. First, we analyzed the relationship between improvisation and entrepreneurial intention in China and examined it empirically, contributing to developing improvisation research and the self-efficacy theory. Although literature that focuses on this relationship in mature economies exists (Hmieleski and Corbett, 2006, 2008), few scholars have examined whether improvisation could be a predictor of entrepreneurial intention in China's transitional economy. Compared to mature economies, the external environment in transitional economies exhibits a high degree of uncertainty (Yu et al., 2020). The transition from a planned economy to a market driven one changes fundamental assumptions, criteria and decision making and represents a genuine transformation, which requires a fundamental paradigm shift and a mentality that thrives on chaos. Therefore, our findings help expand the application of improvisation research in the context of transitional economies and emerging economies using data from China. In addition, existing research mainly sheds light on the influence of antecedents, such as entrepreneurial passion, emotional intelligence and entrepreneurship education on entrepreneurial self-efficacy (Piperopoulos and Dimov, 2015; Cai et al., 2020b). However, we propose the concept of improvisation as the source of entrepreneurial self-efficacy in particular to enrich the research on self-efficacy theory further.

Second, this research helps open the black box of the influence of improvisation on entrepreneurial intention by integrating the entrepreneurial event model with social cognitive theory. Our results indicate that entrepreneurial self-efficacy has a fully mediating role in the relationship between improvisation and entrepreneurial intention. It is crucial to explore how individuals can benefit from improvisation to expand the research on the antecedents of entrepreneurial intention further (Hmieleski and Corbett, 2006). Currently, many scholars consider entrepreneurial self-efficacy as an important mediator in the study of entrepreneurial intention (Mei et al., 2017; Wu et al., 2019; Cai et al., 2020b; Edwards et al., 2022; Kumar and Shukla, 2022). Since the existing literature does not provide detailed information to explain the mechanism of improvisation on entrepreneurial intention, we introduce entrepreneurial self-efficacy based on previous research to reveal the potential connections and attempts to provide preliminary evidence

theoretically. The results also confirm the mediating role of entrepreneurial self-efficacy and provide evidence that entrepreneurial self-efficacy, as a perception of self-efficacy crucial for entrepreneurial intention, is greatly facilitated by improvisation.

Finally, our research enriches the entrepreneurial intention literature by providing deeper insight into the conditions under which entrepreneurial self-efficacy has a more substantial effect on entrepreneurial intention in China. The moderation model results show that the entrepreneurial policy support moderates the relationship between entrepreneurial self-efficacy and entrepreneurial intention. As He et al. (2019) point out, since 2000, China has encouraged people to start businesses in the more impoverished western regions through tax incentives and financial development. Under the background of "Mass Entrepreneurship and Innovation," the overall entrepreneurial environment is gradually improving. However, due to the different stages of development and various opportunities, the entrepreneurial policies in each region are not the same. The idea of entrepreneurship is associated with the process of evaluation, discovery, exploration, and recognition of opportunities (Cai et al., 2020b). As shown in the moderated mediation model, in regions with better entrepreneurial policy support, entrepreneurial self-efficacy is more likely to form entrepreneurial intention. Thus, to stimulate entrepreneurial ideas, the transition economies of China, Brazil and Mexico have launched special entrepreneurial incentives (Covarrubias and Schiavon, 2018; Grover Goswami et al., 2019). Therefore, our study enriches the research on entrepreneurial self-efficacy and entrepreneurial intention based on policy enactment and encourages relevant empirical examinations in different contexts.

Practical implications

Our results also have implications for entrepreneurial practices in challenging business environments like transitional economies. First, we provide significant insight for individuals navigating the context of transitional economies, such as China. In the face of environmental uncertainty, we suggest that improvisation may be a key capability that helps promote higher entrepreneurial intention. Western studies have shown that improvisation can increase entrepreneurial intention (Hmieleski and Corbett, 2006, 2008), and our research also indicates that improvisation favors entrepreneurial intention in transitional economies. China is an important transitional economy experiencing institutional change from central planning to market competition (Cai et al., 2017). Given that countries undergoing economic transition share similar contexts, our research findings are applicable in China and other countries in transition. Considering that individuals face higher entrepreneurial uncertainty in transitional countries, the development of improvisational capability has important practical significance for their entrepreneurial intention. As such, we call on other transitional countries to focus on the research of improvisation, which is crucial to solving problems in the transition process. Second, it is suggested that individuals increase their improvisational capabilities, as the ability will indirectly transfer to entrepreneurial intention through entrepreneurial self-efficacy. The latter is considered a "vehicle" that is likely to lead to entrepreneurial intention, and it is recommended that individuals enhance their entrepreneurial confidence so they can more easily realize entrepreneurial ideas. Third, the government's intervention, such as entrepreneurial policies, provides a favorable climate to promote employment and entrepreneurship. Given this, we examined the entrepreneurial policy support in which individuals are more likely to transform entrepreneurial self-efficacy into entrepreneurial behavior, which has important practical significance for today's social and economic development, particularly in transitional economies.

Limitations and future research

Although this study has certain implications, several limitations require further attention. First, our research only examines the link using data from China's transition economy. We call for this research to be replicated and extended to other transition economies, since the issues discussed here are relevant to all former centrally planned economies undergoing transitions. In future research, data from other transitional countries, such as Eastern European countries including the former Soviet republics, could be collected to increase the validity of research conclusions. Moreover, the results might be different in mature market economies where external environmental conditions are more stable. Further studies could compare transitional economies and mature economies. Additionally, in our research, some items with high similarity and vagueness were omitted based on the context of China, but these items have content validity based on the literature, and thus could be included in future research in a different context to further this research. Finally, the research data were collected at one point in time. The evolution of the relationship between key variables was not captured. In addition to a cross-sectional research approach, future research could apply longitudinal research methods, such as long-term tracking surveys, to examine the interaction between variables over time, such as whether entrepreneurial self-efficacy and entrepreneurial intention has feedback on improvisation over time.

Data availability statement

The data presented in this study are available upon request from the corresponding author.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Faultline configurations affecting the entrepreneurial team performance of new generation of returning migrant workers in China: An empirical study based on fuzzy-set qualitative comparative analysis

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As the impact of faultlines is still without a consensus, to figure out how faultlines will hurt or promote the entrepreneurial performance can help the new generation of Chinese migrant workers to start their businesses successfully under the Rural Revitalization Strategy. This study addressed a fuzzy-set qualitative comparative analysis (fsQCA) based on 32 returning entrepreneurial teams from a complexity perspective. We firstly introduced three faultline categories for migrant workers and selected five of the faultlines with high factor loads in each category for further analysis. Then a scale was developed to measure the team performance. By conducting fsQCA, four types of faultline configurations were found: (1) background-experience actuation; (2) guidance-balance lacking; (3) role-cognition conflict; and (4) information-decision polarization. The "background-experience actuation" type will promote the entrepreneurial performance while the other types will hurt the performance. Theoretically, breaking through the limitations of traditional regressions in previous studies, fsQCA is used to explore the complex interactions and integrated effects among different categories of faultlines, demonstrates that the unstable impact is just a one-sided representation of the overall effect, and fills the general faultline theory with Chinese specific scenario and small-sized entrepreneurship. Practically, several implications are proposed to optimize the heterogeneity of the returning migrant workers' entrepreneurial teams and increase their performances, such as constructing the "balance" and "guidance" mechanism, enriching the background diversity of the members and solving

the information-decision faultlines into individual diversity, etc., which can also be utilized by migrant worker entrepreneurs in other developing areas in the world.

KEYWORDS

the new generation of migrant workers, team faultline, fsQCA, returning entrepreneurship, Rural Revitalization Strategy

Introduction

The construction of modern business in rural areas is always a challenging problem in the world (Malecki, 2003), especially in the developing countries in Southeast Asia, Africa, Latin America, etc., where the rural laborers tend to flow into metropolises with opportunities and resources that cannot be acquired in rural areas, leading to more serious urban-rural imbalance and abnormal urbanization. These workforces are the so-called "migrant workers" who earn their livings in the city while actually have a rural identity. Considering that the extreme outflow of the workforces may contribute to the "the rural penalty" and "rural differential" (Hite, 1997; Hobbs and Blodgett, 1999) restricting the economic development of the countryside, governments across the world are trying to balance the developing level and resource distribution between urban and rural areas, and encourage migrant workers with knowledge and resources to flow back to their rural hometowns. In China, the government has put forward the "Rural Revitalization Strategy," and taken measures to facilitate economic development, farmers' employment and entrepreneurship in rural areas by encouraging the integration of the First, Second, and Third Industry (Cpc Central Committee and State Council, 2022). By excavating multiple values in rural areas, cultivating advantageous and characteristic industrial clusters and implementing comprehensive measures such as the "Rural Revitalization through Digital Commerce" project, several progresses will be made in the field of the agricultural modernization, and the "common prosperity" of people will be significantly promoted. Under these initiatives, various supporting policies have been enacted to attract young migrant workers to leave for their hometowns to start their own businesses. Among them, the new generation of migrant workers has gradually become a prominent part. They play an important role in China's new urbanization and healthy economic and social development (Liu and Xia, 2017), and have become a crucial micro-entity to facilitate the implementation of the Rural Revitalization Strategy and a crucial starting point for policymakers to create equal opportunities between urban and rural areas, inclusive economic growth and shared prosperity.

The new generation of migrant workers in China refers to an emerging group of migrant workers who were born after 1980s, have received some education but have almost no agricultural experience and are engaged in non-agricultural activities in the cities (Wang, 2001). They have not only experienced major economic and social changes such as the comprehensive Reform and Opening-up and the advent of the digital age, forming various background-experience differences, but also received their basic education and job training in the cities and have accumulated a lot of knowledge and experience for basic production, as well as boarder views and richer networking than their rural peers. These factors lead to the great heterogeneity and diversity of Chinese migrant workers in intergenerational, growth background, expertise, and entrepreneurial cognition, which is a basis for bringing rare, unique external commercial resources, information, and knowledge into the entrepreneurial teams (Bourdieu, 1986; Coleman, 1988; Burt, 1997; Acquaah, 2007) so as to enhance their dynamic capability to adjust to the uncertain changes. As the studies of the diversity are gradually deepened from the individual into subgroup level, faultlines proposed by Lau and Murnighan (1998) can be introduced to analyze the diversity among subgroups in their entrepreneurial organizations. To figure out how faultlines will hurt or promote the entrepreneurial performance can help the new generation of Chinese migrant workers to start their businesses successfully under the Rural Revitalization Strategy.

Previous studies mainly divide team faultlines into two categories, i.e., the social-category and information-based faultlines. Most scholars believe that in general, the social-category faultlines tend to negatively affect the entrepreneurial results, while the information-based faultlines tend to positively affect the entrepreneurial results (Bezurukova et al., 2009, Bezrukova et al., 2012; Hutzschenreuter and Horstkotte, 2013; Cooper et al., 2014; Zhang et al., 2020). They supposed that the social-category faultlines will bring the social stereotypes and bias among subgroups and causing "group-in" and "group-out" barriers that damage the communications and performance (Byrne, 1971; Lincoln and Miller, 1979; Jackson et al., 1995), but the information-based faultlines will make the knowledge of the whole team more diverse to finish the group tasks, so as to promote the entrepreneurial performance. There are also some researchers proposing different opinions about the influencing direction of the faultlines. Some of them suppose that the information-based faultlines can act detrimentally

(Baek Choi and Thomas, 2009; Georgakakis et al., 2017) while others suggest that the relationship between faultlines and the results is not linear (Sun, 2015; Hu and Ge, 2020; Ma et al., 2021).

Although the effect of the faultlines have been discussed for decades due to its complex mechanism, it is still in discussion without a consensus. By applying traditional research methods such as multiple linear regression, structure equation model (SEM), and moderated mediating model, etc., the existing studies can only focus on the net effect of a single variable (Ragin, 1987, 2000; Ragin and Fiss, 2008), including relationships among the independent and independent variables (x to y), mediators (x to m to y) and moderators (x to y under m). As the final impact of faultlines may depend on their comprehensive effects (Bezrukova et al., 2012), the linear relationships might not completely reflect the intricate interactions and integrated influence of multiple sorts of faultlines on the entrepreneurial results (e.g., $x_1 + x_2 + x_3$ to y) in the complex managerial scenarios (Misangyi et al., 2017). Therefore, the combinations formed by antecedent conditions in the team, which are the so-called "configurations," should be introduced for this research (Miller, 1986, 1996).

Based on the configuration perspective, the fuzzy-set qualitative comparison analysis (fsQCA) overcomes the limitations of correlation or regression research methods, and discusses the complex causal relationship between conditional configuration and outcome variables from an overall view (Miller, 1986; Ragin, 2000, 2008; Lacey and Fiss, 2009), and is widely used to explore the complexity problems in the managerial reality (Meyer et al., 1993; Delery and Doty, 1996; Miller, 1996; Ragin, 2000). *Via* conducting the QCA, we can find out the faultline configurations that cause the high or non-high performance of the new generation of returning migrant workers' entrepreneurial teams and have a better understanding of the various comprehensive effects of different types of demographic faultlines, and carry out investigations on whether the relationship between these faultline configurations and organizational performance has a causal asymmetry (Rihoux and Ragin, 2009), i.e., if configuration x can cause the outcome y, can we conclude that the configuration x must exist when the outcome y occurs?

The contributions and novelties in this study contain both theoretical and practical aspects as follows: theoretically, breaking through the limitations of traditional correlations and regressions, fsQCA is used as a new method to explore the complex interactions among different categories of faultlines in the returning entrepreneurial teams and focus on the integrated effects of faultlines, which explains that the unstable impact of the faultlines influenced by role cognition, gender stereotype and balanced interpersonal relationship is a one-sided representation of the overall effect, and fills the general faultline theory by being applied and analyzed in Chinese specific scenario and small-sized entrepreneurship. Practically, cognitive theory is applied to optimize the human resource structure of the returning migrant workers' entrepreneurial teams and increase their performances, and several suggestions corresponding to each faultline configurations have been proposed, which provides an academic basis for the relevant policy departments to take specific and accurate countermeasures to promote the concrete implementation of the Rural Revitalization Strategy in China, and can also be utilized by migrant worker entrepreneurs planning to start their businesses under similar conditions of member heterogeneity in Southeast Asia, Latin America, Africa, and other developing areas.

This article is organized as follows. Section "Literature review" illustrates a complete review for the disagreement in the impact of faultlines, as well as the mechanism of the three faultline categories or dimensions based on existing literature. Section "Materials and methods" introduces the research design in detail. Section "Results" shows the results of the fsQCA. In section "Discussion" we have a throughout discussion about the theoretical values, managerial implications and suggestions, and the limitations and the future works.

Literature review

The impact of team faultlines

The concept of team faultline was put forward to deepen the research on the impact of team diversity on team dynamics (Lau and Murnighan, 1998). The team faultline is a hypothetical boundary of one or more subgroups, which will divide the whole team into several subgroups according to different demographic characteristics. Under the division of team faultline, the members of each subgroup have one or more similar demographic characteristics, forming the homogeneity of members in the subgroup and the heterogeneity between subgroups. The members inside and outside the subgroup are divided into "group-in" and "group-out" members. Inspired by the concept of faultline in geology, this concept emphasizes three comparable characteristics: (1) the characteristics of different dimensions of members in the subgroup are similar to different strata and have a sense of levels; (2) potential faultlines need to be activated by external forces; (3) the strong team faultline will show the importance of different attribute levels between subgroups and increase the possibility of conflicts between subgroups.

The analysis of the impact or effectiveness of the team faultline, i.e., the relationship between the team faultline and the team processes and results, in particular team performance, is the focus of research on the team faultline. Currently, academic community has conducted extensive empirical research on the direct effect of team faultlines on performance and the effect of different types of faultlines on performance through

different intermediary and moderating variables from the two perspectives of generality and contingency.

General perspective

Early studies focused on the direct negative effects of the team faultlines on team performance from a general perspective. Originally, Lau and Murnighan (1998) proposed that team conflict caused by the demographic attributes of the team faultline would exacerbate mistrust among members and reduce group satisfaction. By analyzing the subgroup fragmentation in the workgroups or the TMTs in real business organizations, many scholars are also convinced that, with the increase of the general faultline strength, the team performance will be spoiled (Li and Hambrick, 2005; Barkema and Shvyrkov, 2007; Ndofor et al., 2015; Vandebeek et al., 2016). However, as the mechanism of the impact of team faultline on an enterprise's performance may be highly complex, it's difficult to draw a firm conclusion just by simply considering the correlation between the two. Therefore, the research on the effectiveness of faultline will soon change the perspective of generality into contingency, which is also at the root of the long-standing disagreement about the relationship between team failure and performance, i.e., as the managerial scenario changes, the faultlines might act totally differently.

Contingency perspective

In the stage of conducting research from the perspective of contingency, the academic community classifies the team faultline into social-category faultlines, characterized by demographic attributes such as gender, age, and race, and information-related faultlines, characterized by educational background and work experience, according to the correlation between the faultline and team tasks (Bezurukova et al., 2009), or bio-demographic faultlines and task-related faultlines (Hutzschenreuter and Horstkotte, 2013), and discussed in combination with mediation and moderating model. This kind of research refined the independent variable types of faultlines and laid a foundation for exploring the comprehensive action mechanism of various complex types of faultlines. However, the academic community has produced the following main divergent views on the action direction of different types of faultlines:

1. Information-related faultlines are usually positively correlated with team performance, while social-category faultlines are generally negatively correlated with team performance. Bezurukova et al. (2009) put forward this view and studied the team identification and faultline width as moderating variables; later, Bezrukova et al. (2012) further believed that if the information-related faultlines could not offset the negative impact of the social-category faultlines, the team performance would show a downward trend; Through empirical research on 61 German enterprises, Hutzschenreuter and Horstkotte (2013) also verified the positive effect of bio-demographic faultlines on product extension and the negative impact of task-related faultlines on that; Zhang et al. (2020) further argued that the social-category faultlines and information-related faultlines of entrepreneurial team jointly affect the intermediary variables of role clarity under the moderating effect of team identity, and ultimately affect entrepreneurial performance. Cooper et al. (2014) indicated that information-based faultline strength promotes the performance under low environmental dynamism, high complexity, and high munificence, while hurts the performance under high environmental dynamism, low complexity, and low munificence. Tuggle et al. (2010) made a research on the faultlines' impact on several fields including strategies, innovation, international expansion as well as decision-making, and all of the results show the detrimental effect of the social-category faultlines.
2. The information-related faultlines have a significant negative effect, but the effect of social-category faultlines is unpredictable. For example, Georgakakis et al. (2017) conducted empirical research on 248 large international companies, focusing on the impact of CEO-TMT social-category faultlines and enterprise performance on the company's financial performance under the adjustment of intermediary variables such as CEO-TMT similarity, tenure overlap, experience diversity and other mediating variables, while the impact of knowledge-related faultlines was not significant; Baek Choi and Thomas (2009) found that both relationship-focused faultlines and task-focused faultlines impair organizational performance.
3. The strength of both information-related and social-category faultlines has an inverted "U" relationship with enterprise performance. For instance, the research of Sun (2015) and Hu and Ge (2020) shows that with the increase of the strength of the two types of team faultlines in the entrepreneurial team, under the moderating effect of various variables, its influence on the team innovation performance changes from negative to positive and then back to negative. Ma et al. (2021) analyzed listed manufacturing corporates in China and found that there is also an inverted U-shaped relationship between task-related faultline and green technology innovation, while bio-demographic faultline has no significant influence on green technology innovation. Only by controlling the strength of team faultlines in a reasonable range can the company's innovation performance reach the best level.

Besides, scholars also draw their attention to figure out how environmental factors mediating or moderating the impact of the faultlines based on the contingency perspective:

1. For mediating effects, scholars have paid their attentions to the intermediation of the further inter-relationship among members. Quite a few scholars took relationship and task conflict as intermediary variables, and indicated that both information-based and social-category faultlines will possibly raise the relationship and task-focused faultlines, and both of the two conflicts may spoil the team performance (Pearsall et al., 2008; Baek Choi and Thomas, 2009; Thatcher and Patel, 2012); Veltrop et al. (2015) found that the team faultline has the disruptive effects on reflexivity which can promote the team results; Zhang et al. (2020) verified that the role clarity that can strengthen the team performance will be inversely affected by faultlines, etc.
2. For moderating effects, existing research mainly investigated outer factors such as environmental uncertainty (Yang and Zang, 2022), environmental dynamics (Cooper et al., 2014), etc., and inner factors such as team identification (Bezurukova et al., 2009; Zhang et al., 2020), shared objectives (Knippenberg et al., 2010), CEO-TMT interactions and similarities (Kaczmarek et al., 2012; Georgakakis et al., 2017), task interdependence (Kwon and Lee, 2020), dual leadership (Zhang et al., 2019, 2022), etc. Most of the studies we mentioned demonstrate that as the degree of complexity and change of the outside environments increases, the faultlines' negative effect will be alleviated as the focus of the members will be shifted from inner conflicts to outer survival or development; as the identification and consensus becomes stronger and the communication and learning systems becomes more mature, the overall awareness of members and the paths to deal with conflicts are more complete, so the impact of the faultlines can also be adjusted to positive. These moderating results have challenged the traditional mindset about the negative faultline influence based on general perspective with persuasive empirical evidence.

To sum up, from the perspective of research methods, although the existing studies are of great significance for understanding the mechanism of team faultline effectiveness, most of them use the general and contingency perspective *via* the traditional regression analysis method to study the correlation between the mutually independent faultline conditions and the outcomes to judge the positive and negative effects. Such research based on mutually independent team faultlines is not conducive to considering the impact of multiple team faultlines on team performance comprehensively, as well as the in-depth exploration of the comprehensive mechanism of the complex relationship between different types of team faultlines under managerial practice. This means that a new method which can analyze the integrated impact of different types of the faultlines should be applied in our study to contribute to fill the present research gap.

Faultline categories in the new generation of Chinese migrant workers' entrepreneurial teams

Based on the understanding of the new generation of migrant workers and the explanations of the mechanism of different types of team faultlines in previous studies, we summarize three typical categories or dimensions of the faultlines for the new generation of migrant workers' entrepreneurial teams. Faultlines in the same category have similar natures and mechanism to affect the entrepreneurial performance of the teams. Their detailed influencing mechanisms are as follows.

The information-decision faultlines

This type of faultline includes expertise faultline, risk preference faultline, etc. These faultlines are based on the knowledge perspective and preference when making decisions on a specific business behavior in the short-term after starting entrepreneurship, which can be strongly related to the specific business decisions of the returning entrepreneurial team, and affect the formation of the diversified decision-making information resource pool in the entrepreneurial team of the new generation of returning migrant workers. According to information decision theory, when team members are aware of their knowledge differences, they will spontaneously or consciously use the multiple value of differences and efficiently use all available cognitive resources in the team to form a knowledge pool (Tsui et al., 1992; Jehn, 1997; Williams and O'Reilly, 1998; Jehn, 1999; Webber and Donahue, 2001; Bezurukova et al., 2009), and be able to allocate resources in a timely and flexible manner as team members work together to complete tasks and make decisions. Additionally, team members may also be more willing to collaborate across faultlines (Gibson and Vermeulen, 2003; Cramton and Hinds, 2005) to form a "synthetic perspective" based on the whole team, improve the decision-making quality of entrepreneurial teams and lead to the progress of team performance (Schweiger and Sandberg, 1989; Schwenk, 1990; Bezurukova et al., 2009). As the new generation of migrant workers show a low degree of unity between expertise and entrepreneurship and a lack of appropriate support from basic expertise (Shi and Wang, 2020), if their entrepreneurial team has agriculture and industry-related technologies and diversified members with economic and management education or professional experience, it will obviously make their entrepreneurship more scientifically, and enlarge the possibility of their entrepreneurial success. What is more, in terms of making decisions with risks, due to the characteristics of small scales, a high risk, and high proportion of self-raised funds in the entrepreneurship of the new generation of migrant workers, their decision-making is often in contradictory orientations between conservative management and bold innovation.

Therefore, the strength comparison of subgroups with different risk preferences will profoundly affect the decision-making tendency of the entrepreneurial teams, resulting in the fluctuations of performance at last.

The background-experience faultlines

This type of faultline includes age intergenerational faultline, growth environment faultline, etc. Because of the intergenerational and growth environment differences among the members of the entrepreneurial team of the new generation of migrant workers, they will experience different historical development, information intake, and mindset change in the process of growth, forming different cognition and social skill accumulation, which is a kind of long-term information and cognitive difference. On the one hand, the older generation of migrant workers will use all their resources, such as original capital, social experience, and emotional accumulation (Wang, 2019), to the new generation to fully support or guide the entrepreneurial behavior of the new generation of migrant workers and even directly participate in team entrepreneurship (Liu and Xia, 2017). On the other hand, there has long been a "dual structural" difference between urban and rural areas in China, making the new generation of migrant workers with different growth environments significantly vary: the new generation of migrant workers living or working in cities have more urbanized ideas, behaviors and identity, as well as a broader, diversified vision, and a more abundant social capital and relationship network (Liu and Xia, 2017); while those who grow up in a rural environment are more likely to be exposed to higher life pressures and their personal performance, pressure resistance and adaptability in life experiences are increased, they have stronger entrepreneurial resilience (Connork and Davidson, 2003; Wu et al., 2021). The previously mentioned diversity means that the members of such founding teams, who are influenced by different growth backgrounds, have more complex behavioral intentions and corresponding entrepreneurial behavioral differences (Ajzen, 1991). At the same time, they have the characteristics of adapting to the urban–rural dual economic and social environment, which has a profound impact on their entrepreneurial development.

The role-motivation faultlines

This type of faultline includes gender faultline, etc. This type of faultline directly reflects the heterogeneity of returning entrepreneurial team members in gender roles, task roles, and personality roles. Different members will have differentiated motivation and behavior orientation based on their own decision-making. Gender role differences are the most prominent among them: in terms of the choice of entrepreneurial scale, due to the traditional value of "inheritance of the eldest son" in China and the differences in risk preference and income expectation between genders, male returning entrepreneurs prefer to choose large-scale and capital-intense entrepreneurial forms based on the development motivation of "making a big fortune." Among them, the most important is private enterprise creation and equity investment, which differs greatly from returning women entrepreneurs who choose self-employment and other forms of entrepreneurship based on family survival motivation (Fu et al., 2014). This discrepancy directly affects the return on investment and the absolute return on relevant entrepreneurial projects. When it comes to product and service innovation, women entrepreneurs can give their thinking advantages more space than men, design unique products and services, and reduce the market competition entrepreneurial teams face (Huang et al., 2012). The differences above show that the gender faultline in the entrepreneurial teams of the new generation of returning migrant workers will affect the development size and the competitive level of the team in the market by influencing entrepreneurial motivation and behavior in making relevant decisions.

Materials and methods

Methods

The fsQCA was first proposed by Ragin (1987). Based on the configuration perspective, the organization is best understood as a cluster of interconnected structures and practices rather than a single entity or loosely combined entity, so it cannot be understood in terms of an isolated analysis of components (Fiss, 2007). It overcomes the limitations of correlation or regression research methods on the "net effect" of independent variables on dependent variables (Rihoux and Ragin, 2009). It discusses the complex causal relationship between conditional configuration and result variables from an overall perspective, which is closer to the actual management situation. Besides, fsQCA also has the following advantages (Du and Jia, 2017): (1) it is suitable for investigating the causal asymmetry between conditions and results (Rihoux and Ragin, 2009), which can further compare the configurations that lead to the emergence and disappearance of results and broaden its theoretical interpretation dimension of specific research problems; (2) combining the benefits of quantitative and qualitative research and identifying the mechanism of action of condition variables based on a cross-case comparison of large, medium, and small samples (Ragin, 2008; Berg-Schlosser and De Meur, 2009; Crilly et al., 2012; Greckhamer et al., 2013; Greckhamer, 2016), which not only makes up for the lack of external promotion of the original qualitative research, but also breaks the necessary restriction on a large number of samples in quantitative research; and (3) since there are more than one conditional configuration, that causes specific results, which is equivalent (Fiss, 2011), using fsQCA, we can understand the internal driving mechanism that leads to different results in different situations by investigating

these equivalent configurations, and discuss the adaptation and substitution relationship between conditions, i.e., "All roads lead to Roma" effect.

Samples

Select the returning entrepreneurial teams with similar conditions all over the country and carry out a questionnaire survey to collect members' demographic attributes. To ensure the validity, reliability, and recovery rate of the questionnaire, this study screened the subjects to ensure that they are the core personnel of the entrepreneurial teams and distributed two types of questionnaires to every entrepreneurial team: (1) the questionnaire for members' information (see **Supplementary material**), which collected the heterogeneity characteristics of each member of the team in the form of multiple-choice questions, and the distribution quantity depends on the number of team members; (2) the performance measurement table (see **Table 1**) adopts the Likert 5-point scale to collect data, and takes the weighted average as the score to measure the entrepreneurial performance of every new generation of migrant workers' returning entrepreneurial team. Each team will only issue one copy, and the team leader will fill in the evaluation sheet according to his own experience and actual business circumstance. Make provisions on the validity of the recovered questionnaire: when each entrepreneurial team participating in the survey submits one performance measurement table and no less than three questionnaires for members' information, and all the questions in the questionnaire are answered, the questionnaires submitted by the team will be confirmed as valid ones. This study distributed 229 member information collection questionnaires and 40 performance measurement tables. For pre-survey which selects the faultlines for further research, 221 member information collection questionnaires from 45 teams were collected, and the effective rate was about 96.5%. For fsQCA which summarizes the faultline configurations, 149 member information collection questionnaires were collected, and the effective rate was about 65.1%; 32 effective performance measurement tables, with an effective rate of 80%. The descriptive statistics of team member attributes are shown in **Table 2**.

Measurement and calibration

Antecedent: Team faultline strength

The FLS team faultline strength measurement was proposed by Shaw (2004), which can calculate the team faultline strength of each feature and deal with the calculation of faultline strength between multiple features and subgroups more flexibly than other faultline strength measurements. And the measurement results can comprehensively reflect the homogeneity level within the same subgroup and the heterogeneity level between different subgroups across the faultlines. The strength of the faultlines can better reflect the power comparison and polarization relationship between the subgroups. By collecting the demographic characteristics of the members of the new generation of returning migrant workers' entrepreneurial teams, this study realizes the FLS measurement to calculate the strength value of the faultlines of each attribute team. The algorithm has strong flexibility and can measure the strength of each demographic faultline, such as age, gender, and so on, so that this research can be carried out based on taking each demographic faultline as an antecedent condition, as shown in the following formula.

$$FLS = IA \times (1 - CGAI)$$

In the above formula, *IA* means the index of alignment in each subgroup, whose value is between 0 and 1; *CGAI* means the cross-group alignment index, which is also between 0 and 1; (1-*CGAI*) indicates the cross-group heterogeneity, which illustrates the diversity among subgroups. The FLS of each team can be found in the **Supplementary material**.

Outcome: Performance of returning entrepreneurial team

As far as the research on the performance of the returning entrepreneurial team is concerned, due to the characteristics of small scale, low income, poor stability, low entrepreneurial satisfaction, and inconvenient disclosure of financial and market data, the objective performance will be limited by poor comparability and inconvenient access. Therefore, this study selects subjective indicators as the basis of entrepreneurial performance measurement. We draw lessons from existing studies and use the Likert 5-point scale to collect performance information such as financial, market, product, employee, and organizational satisfaction (Choi and Thomas, 2010; Zhu and Xie, 2012; Shen et al., 2013) and divide the items into two categories: inner indicators and outer indicators. The weighted average of the sum of the two parts of indicators is used as the observation value of the comprehensive evaluation index, as shown in **Table 1** below. The Cronbach's α of the subjective performance measurement questionnaire reaches 0.923, much higher than the acceptable threshold of 0.7, further suggesting that the internal consistency and good validity of the scale. The following formula explains the calculation process of the entrepreneurial performance.

$$Performance = 0.5 \sum_{i=1}^{n} inner_i + 0.5 \sum_{j=1}^{m} outer_j$$

In the above formula, $inner_i$ represents the *i*-th inner indicator in **Table 1**, while $outer_j$ represents the *j*-th outer indicator in **Table 1**; *n* and *m* is the amount of the inner and

TABLE 1 Performance measurement scale of returning entrepreneurial team.

Indicators	Items	Factor loads	α
Inner indicators (50%)	1. The production capacity of the enterprise is stable	0.84	0.89
	2. Often launches new products or services	0.75	
	3. Product quality makes customers satisfied	0.80	
	4. Employees can work efficiently	0.77	
	5. The enterprise has the confidence to survive and operate	0.71	
Outer indicators (50%)	1. Rapid turnover growth	0.59	0.86
	2. Rapid profit growth	0.67	
	3. The enterprise has sufficient working capital	0.55	
	4. The enterprise has a stable market share	0.69	
	5. The market share position and reputation of the enterprise has gradually increased	0.87	

TABLE 2 Descriptive statistics.

Attributes	Measurement items	Sample size	Percentage (%)
FLS_{age}	The post-1980s generation	66	44.3
	The post-1990s generation	47	31.5
	The post-2000s generation	2	1.3
	Others	34	22.8
FLS_{gender}	Male	104	69.8
	Female	45	30.2
$FLS_{background}$	Urban	58	38.9
	Rural	91	61.1
$FLS_{expertise}$	Economic management	32	21.5
	Science and technology	54	36.2
	Other types	63	42.3
FLS_{risk}	Adventure	44	29.5
	Intermediate	60	40.3
	Conservative	45	30.2

outer indicators, respectively. The performance score of each team can be found in the **Supplementary material**.

Research framework

Based on the FLS faultline strength measurement and the fsQCA, this study will take the entrepreneurial team performance as the outcome variable and take the demographic faultlines in the entrepreneurial teams of the new generation of returning migrant as the antecedents for configuration analysis according to the dimensions of information-decision type, role-motivation type, and background-experience type of faultlines, exploring the causal relationship between the various faultline configurations and the performance of returning entrepreneurial teams.

For selecting the most suitable faultlines reflecting the subgroup diversity of the new generation of migrant workers' entrepreneurial teams, this study carried out a pre-survey conducted the principal component analysis (PCA) and factor analysis on the main team faultlines (see factor loads in **Table 3**). Three main categories or dimensions of faultline are extracted: information-decision type, role-motivation type and background-experience type, which cover about 68% of the information of original faultlines. To avoid the "limited diversity" in the QCA caused by too many antecedents (Berg-Schlosser and De Meur, 2009; Greckhamer, 2016), this study further screened the existing demographic faultlines, retained the faultlines with a factor load greater than 0.8 in each type as the representatives of antecedents. The final research framework is shown in **Figure 1**.

Fuzzy-set qualitative comparative analysis

Calibration

Before the qualitative comparative analysis, it is required tocalibrate the fuzzy set data at first. A fuzzy set can be regarded asa continuous variable to represent the degree of membership between "Fully in" and "Fully out." The process

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TABLE 3 Principal component factor coefficient matrix.

Faultline	Categories or dimensions		
	Information-decision	Background-experience	Role-motivation
FLS_{risk}	**0.82**		
$FLS_{expertise}$	**0.81**		
FLS_{edu}	0.78		
FLS_{age}		**0.93**	
$FLS_{background}$		**0.81**	
FLS_{gender}			**0.81**
$FLS_{motivation}$			0.57
FLS_{role}			0.42

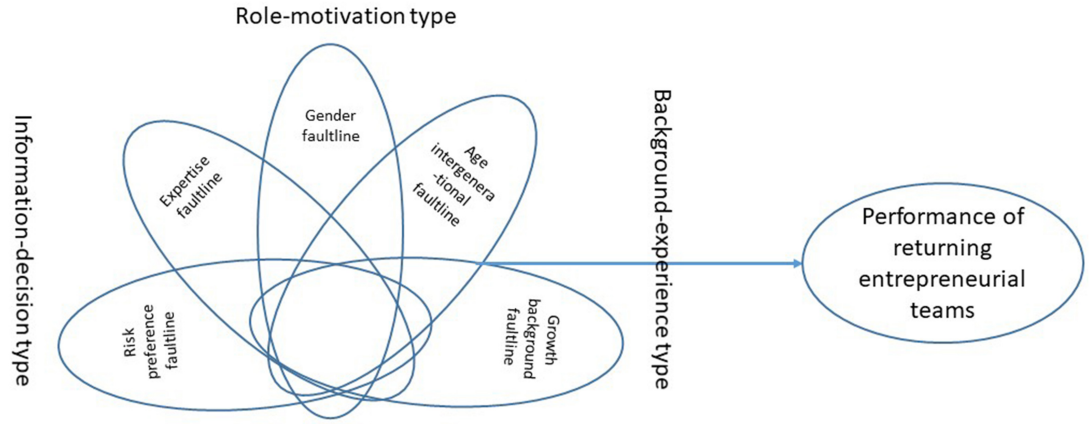

FIGURE 1
Research framework.

of assigning collective membership to these cases is called calibration (Schneider and Wagemann, 2012; Du and Jia, 2017). Given that the antecedents primarily reflect the strength of each faultline within each new generation of migrant workers' entrepreneurial teams, and the outcome is the total score on the scale, which is the actual measured value, the mechanical anchor is used to calibrate the data set (Ragin, 2008), the "fully in" value is set as the upper quartile, and the "crossover" is set as the median point of the data set, then the "fully out" value is set as the lower quartile of the dataset. The anchor points of each conditions are determined in **Table 4**.

Necessity analysis

A necessary condition can be regarded as a superset of the result. Rihoux and Ragin (2009) indicated that if the necessary condition is included in the truth table analysis, it may be removed from the solution included in the "logical remainder," that is, the necessary condition may be eliminated by the parsimonious solution. Therefore, before analyzing the configurations, it is also necessary to check the necessity of each condition separately, then analyze the sufficient conditions that cannot be used as the necessary conditions alone, and screen the configuration with the greatest explanatory power for the target case by using the method of "Boolean algebra minimization." When analyzing the necessary conditions, attention should be paid to the consistency between each condition and the outcome. If the consistency is greater than 0.9, the condition constitutes the necessary condition for producing the result.

It can be seen from **Table 5** that the necessity of the conditions of every single faultline strength affecting the high or non-high entrepreneurial performance of the new generation of returning migrant workers does not exceed 0.9, which does not constitute a necessary condition. It is indicated that the strength of each demographic faultline generally has a weak explanation for the result variable of entrepreneurial team performance of the new generation of migrant workers. Therefore, these antecedents, namely all the demographic faultlines will be included in the fsQCA to explore the configurations leading to high and non-high entrepreneurial performance.

TABLE 4 Calibration anchor points of each variable.

Variable		Anchor point		
Type	**Faultline**	**Fully out**	**Crossover**	**Fully in**
Information-decision	$FLS_{expertise}$	0.0425	0.0800	0.1475
	FLS_{risk}	0.0500	0.1150	0.1875
Role-motivation	FLS_{gender}	0.0525	0.1150	0.2025
Background-experience	FLS_{age}	0.0300	0.0900	0.1100
	$FLS_{background}$	0.0000	0.1200	0.2550
Outcome	Team performance	20.500	21.500	22.375

TABLE 5 Necessity test results.

Antecedent		Outcome			
		High performance		Non-high performance	
Type	**Faultline**	**Consistency**	**Coverage**	**Consistency**	**Coverage**
Information-decision	Strong FLS_{risk}	0.5273	0.4994	0.5829	0.6256
	Weak FLS_{risk}	0.6047	0.5613	0.5335	0.5613
	Strong $FLS_{expertise}$	0.4327	0.4171	0.6335	0.6922
	Weak $FLS_{expertise}$	0.6807	0.6210	0.4665	0.4824
Role-motivation	Strong FLS_{gender}	0.5747	0.5445	0.5082	0.5458
	Weak FLS_{gender}	0.5207	0.4830	0.5759	0.6054
Background-experience	Strong FLS_{age}	0.6193	0.5752	0.5288	0.5567
	Weak FLS_{age}	0.5227	0.4946	0.5964	0.6397
	Strong $FLS_{background}$	0.6293	0.5680	0.5500	0.5626
	Weak $FLS_{background}$	0.5153	0.5026	0.5776	0.6385

Analysis of faultline configurations

The following analyzes the team faultline configurations that lead to the high and non-high performance of the new generation of migrant workers' returning entrepreneurial teams. These different configurations represent the combination of different types of team faultlines that achieve the same result (high entrepreneurial performance or non-high entrepreneurial performance). At the same time, the configurations found in this work are named after the process of configuration theory (Furnari et al., 2020).

Firstly, referring to the existing research, this article sets the consistency threshold and PRI consistency threshold to 0.8 and 0.65, respectively, and sets the case frequency threshold to 1 to carry out the configuration analysis of the antecedent conditions. Secondly, the intermediate solution and the parsimonious solution are compared to distinguish the core conditions and the peripheral conditions. The criterion for distinguishing is that when a condition appears in the intermediate solution and the parsimonious solution at the same time, it will be regarded as the core condition; when a condition only appears in the intermediate solution, it will be regarded as a peripheral condition. The analysis results are shown in **Table 6**. The tagging method of Ragin and Fiss (2008) is followed in the table. The condition variables appear with ●, and absent with ⊗; the large circle represents the core condition and the small circle represents the peripheral condition. A blank cell indicates that the conditional variable is irrelevant (present or absent). Among them, four types of faultline configurations affecting the entrepreneurial performance of the new generation of migrant workers' returning entrepreneurial teams can be obtained, which respectively constitutet he sufficient conditions for the new generation of migrant workers' high and non-high returning entrepreneurial performance. In addition, the coverage index reflects the proportion of cases that can be explained by the particular configuration and the explanatory power of the configuration to the case outcomes.

Generally, the coverage of the overall solution of the configurations producing high entrepreneurial performance has reached about 0.39, indicating that about 39% of the cases of high entrepreneurial performance of the new generation of returning migrant workers can be explained by this type of configuration (H1a or H1b); the coverage of the overall solution of the configuration generating non-high entrepreneurial

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TABLE 6 Faultline configurations.

Antecedent		Outcome					
		High performance		Non-high performance			
Type	Faultline	H1a	H1b	NH1a	NH1b	NH2	NH3
Information-decision	FLS_{risk}	⊗	•	⊗	⊗	●	●
	$FLS_{expertise}$	⊗	⊗	●	●	•	●
Role-motivation	FLS_{gender}	•	⊗	⊗	⊗	●	
Background-experience	FLS_{age}	●	●		•		
	$FLS_{background}$	●	●	⊗		⊗	•
Consistency		0.78	0.80	0.93	0.94	0.89	0.96
Coverage		0.20	0.21	0.17	0.14	0.20	0.20
Unique coverage		0.15	0.16	0.07	0.05	0.13	0.11
Solution consistency		0.78		0.93			
Solution coverage		0.36		0.50			

performance reached about 0.53, indicating that about 53% of the cases of non-high entrepreneurial performance of the new generation of returning migrant workers can be explained by these three types of configurations (NH1a or NH1b; NH2; and NH3). The coverage indicators in **Table 5** show that all configurations have strong persuasion in explaining the high or non-high performance of the new generation of migrant workers returning to their hometowns to start businesses.

Robustness test

To ensure the reliability and validity of the configuration model, the robustness of the configuration analysis results was tested. The result shows that the four configuration types in the testing model are generally consistent with the prominent characteristics of each configuration in the original model, indicating that the research conclusion is relatively stable.

Results

Configuration types of faultlines producing high entrepreneurial performance

Type H1: The background-experience actuation type

It is characterized by the appearance of the strong background-experience type of faultlines and weak information-decision type of faultlines as the core conditions. It contains two subtype configurations, with the emergence of gender faultline and risk preference faultline as the peripheral conditions, respectively. On the one hand, although the members of the entrepreneurial team of the new generation of returning migrant workers have different social attributes, under the influence of the common identity of the "new generation of migrant workers," entrepreneurial members can sensitively confirm their common identification in their social role and perceive their sense of belonging to the group (Li and Wang, 2014), which is an important reason why background-experience type of faultlines rarely plays a positive role rather than a negative role in other management scenarios. The common background and experience of the "new generation of migrant workers" make them highly united in the identity homogeneous entrepreneurial team and make the team more cohesive, which is enough to resolve the conflict caused by the different mindsets shaped by the specific growth environments and life experiences (Bezurukova et al., 2009). Based on this, with the help of the diversity of experience and mindsets mentioned before, returning entrepreneurs can cause a situation in which the old leads the young or the strong leads the weak, improving the overall entrepreneurial ability of the team. That is what we call "the guidance mechanism."

On the other hand, the weak information-decision faultlines of the team are not caused by the lack of knowledge heterogeneity of subgroups but by different professional knowledge held by each member. Taking team 8160 (see **Supplementary material**) as an example, the expertise of four members covers all three types involved in the research, i.e., the diversity of professional knowledge at the member level is too strong, resulting in the "medium" heterogeneity in the subgroup level that can contribute to the occurrence of strong faultlines (Lau and Murnighan, 1998). Therefore, while maintaining the diversity of information-decision, teams with the H1 configuration type can minimize the confrontational subgroup conflicts and promote the generation of high returning entrepreneurial performance.

In addition, risk preference (H1a) or gender faultline (H1B) can replace each other as a peripheral condition, that is, the occurrence of any and only one of them can affect judgment and cognition during the decision-making process. Driven orderly by the guidance mechanism, through the balance of power at the subgroup level, it plays a stabilizing role in decision-making, suppressing the tendency of blind and perceptual decision-making, then contributing to high entrepreneurial performance. That is what we define as "the balance mechanism."

Configuration types of faultlines producing non-high entrepreneurial performance

Type NH1: The guidance-balance lacking type

It is characterized by weak risk preference faultline, weak gender faultline, and strong information-decision type of faultlines as the core conditions, including two subtypes. The returning entrepreneurial team under this type of configurations lacks not only the long-term experience guidance brought by the diversity of growth background, but also the balance and stability for decision-making. In the absence of guidance and balance mechanism, team members will form highly similar deep-level cognition based on the alignment of growth background, such as risk preference, which will lead to a high degree of unity in their views on decision-making, and there are few objecting voices in the decision-making process. Nevertheless, due to the extreme disparity of subgroup size (such as 1:n), weak subgroups will be outnumbered by other strong ones and it will be difficult to have a significant impact on the team's decision-making in order to reduce the frequency of opinion expression and weaken the balance in the later development of the team (Lau and Murnighan, 1998).

Taking team 9227 (see **Supplementary material**) as an example, most of its members are highly similar in gender and growth background (male; rural), and their risk preference all tends to be "intermediate." Due to the convergence of cognition, the team will be easy to reach an agreement with the decision-maker based on one-sided experience and be trapped in the dilemma of using abundant, diverse information resources to implement irrational entrepreneurial behavior (such as investing in high-risk or low return projects). Under this circumstance, the positive impact of information-decision heterogeneity cannot offset the negative impact of irrational decision-making judgment, resulting in non-high performance.

Type NH2: The role-cognition conflict type

Its prominent feature is that the strong gender faultline and strong risk preference faultline are the core conditions, and the growth background faultline is missing. In this configuration, gender roles and their associated risk preference differences exist at the same time. It is generally believed that women are good at emotional decision-making while men are good at rational decision-making; risk preference directly affects risk choice. A considerable part of the entrepreneurial groups of the new generation of returning migrant workers is female. They can have male characters, such as risk-taking or good leadership skills, as well as feminine characteristics, such as sensitivity and good interpersonal communication (Zhou and Cui, 2021). Influenced by traditions and stereotypes in gender roles, male entrepreneurs in the new generation of migrant workers may have potential conflict points with female entrepreneurs with masculine cognitive characteristics. In addition, lacking the driving mechanism in the background-experience actuation type, the social experience of each member is so similar that the status of members with the same growth background is more equal since there is no authoritative subgroup composed of older or experienced members in the team. Different from the situation in which either of the two occurs alone, when the strong gender faultline and the strong risk preference faultline occur at the same time, due to the integration of identity and cognition discrepancy, it is easier to cause fierce conflicts between subgroups in the process of decision-making balance, reducing team cohesion and produce negative effects.

Taking the typical team 8744 (see **Supplementary material**) as an example, the team members are highly resembled in the growth background, i.e., "post-80s; rural," and there is no subgroup with long-term experience advantage as the authoritative guides to instruct the team's decision-making; the gender subgroups and the risk preference subgroups have observable overlap. In the case of poor guidance, it is very likely to produce conflict in risk decision-making between subgroups to reduce decision-making efficiency and team cohesion and negatively affect team performance.

Type NH3: The information-decision polarization type

Its prominent feature is that two high-intensity information-decision faultlines appear as the core conditions at the same time. The emergence of this type of faultline configuration verifies the theory of Georgakakis et al. (2017) and Lau and Murnighan (1998) once again: even the faultline of information-decision team, which is generally considered to have a positive impact, can lead to a highly internal division and task conflict in the team by dividing the whole team into subgroups with equal scale, resulting in low team performance. Specifically, the information difference between subgroups is different from that among subgroup members: as information subgroups with equal power, the professional views of members in the same subgroup are based on the common knowledge background on the decision making process, which is easy to gain the acknowledgment and support from other members within subgroup; driven by small collective groups, individual differences within the team will rise to differences between subgroups; in

order to obtain stronger support within the subgroup, members in subgroup tend to produce "polarization" in opinions (Lau and Murnighan, 1998), which will significantly deepen the conflict of dissents between the subgroups, thus strengthening the "group-in and group-out" effect, limiting information sharing and seriously weakening the actual utilization of diversified resource pools, causing extremely adverse impact on team performance finally (Georgakakis et al., 2017).

Taking team 3314 (see **Supplementary material**) as an example, the strength of its expertise faultline is strong, i.e., "Other types vs. Economic management," and the size of the expertise subgroups is similar (3:2). Besides, it is highly consistent with the risk preference faultline (Adventure vs. Intermediate). The observable strong information-decision faultlines, which can predict the extent of its task conflict and the polarization of the subgroup, make the team rank in the penultimate in entrepreneurial performance among the 32 teams.

Conclusion

Based on the team faultline theory and using a qualitative fuzzy set comparison analysis, aiming at the research issue of "how do the different types of faultline configurations affect the entrepreneurial team performance of the new generation of returning migrant workers," this article analyzes the different combinations among the information-decision type, the role-motivation type and the background-experience type of faultlines in 32 new generation of returning migrant workers' entrepreneurial teams with similar conditions in China.

Through analysis, we obtain four types of faultline configurations: background-experience actuation (H1); guidance-balance lacking (NH1); role-cognition conflict (NH2); information-decision polarization (NH3). Based on the results we gained, this study draws the following conclusions: (1) the team faultline configuration driven by background-experience differences has a positive impact on the performance of the new generation of migrant workers' returning entrepreneurial team through the formation of identity, driving and guidance, and balance mechanism in the team; (2) the guidance-balance lacking type, role-cognitive conflict type and information-decision polarization type of faultline configurations negatively affect the performance of returning entrepreneurial teams through irrational decision-making and polarization conflict between drama teams; (3) there is causal asymmetry between the conditions of team faultlines and the results of team performance. For instance, the existence of a strong gender faultline and strong risk preference faultline may lead to non-high performance (NH2), but non-high performance does not necessarily mean that there are strong gender faultline and strong risk preference faultline (NH1) in the team; and (4) there is an imbalance in the number of types of team failure configurations that produce high-performing and non-high-performing the returning entrepreneurial teams of the new generation of migrant workers.

The configuration types that produce non-high performance are significantly more than those that produce high performance, indicating that the urgency to avoid weaknesses is greater than to develop strengths. The problem of team faultlines in the new generation of migrant workers' returning entrepreneurial teams urgently needs to be properly solved under the guidance of scientific management theory.

Discussion

Theoretical contributions

The contribution of this study to the development of theory mainly lies in three aspects: research methods innovation, local managerial scenarios, and practical instructions. Among them, the innovations in methods and scenarios contribute to the development of the faultline theory directly, while the instructive suggestions contribute to the scientific management of the human resource management and the increase of the business performance of the new generation of migrant workers' entrepreneurial teams, helping them to successfully run their businesses in their rural hometown.

In terms of the research method, we have used the fsQCA method to study the effectiveness of team faultlines on team performance and select the information-decision type, the role-motivation type, and the background-experience type of faultlines discovered in the returning entrepreneurial teams of the new generation of Chinese migrant workers as the dimensions of antecedent conditions. To a certain extent, this analysis of each specific faultline configuration as a whole corresponds to the prospect of some scholars at present exploring the interaction of different types of faultlines at present, and provides empirical confirmation. It will help give a specific reference for interpreting the differences in the effectiveness of the faultlines on team results and better understanding the mechanism of influence of the team faultlines. In a way, it can explain that the instability of the negative or positive effects of the simple social-category faultline or information-related faultline originates from the different configurations of various faultlines types and is limited to the guidance and balance mechanism, polarization effect and other factors caused by different configurations, which is a one-sided representation of the overall effect of the configurations.

In terms of the research scenario, we have taken the new generation of migrant workers in China as the special

focus, aiming at enriching the management theory of the new generation of migrant workers returning to their hometowns to start businesses. The previous research on the application of the team faultline theory exists mainly in the research field of the top management team of publicly traded companies, e.g., the CEO-TMT interaction, etc., which lacks attention to small and medium-sized entrepreneurs and entrepreneurial teams. Small and medium-sized entrepreneurial teams, especially those resembling the entrepreneurial teams of the new generation of migrant workers, are characterized by a lack of management skills and experience, significant vulnerability, and a survival purpose greater than the development purpose in operational and managerial activities due to their uniqueness characteristics such as resource scarcity and poor team configuration. It has clear differences from the management context of large listed companies, which is a research topic that can be extended by the theory of team faultline at present. On the one hand, we can find the rationality of the existing team faultline theory and the special differences between various management subjects; on the other hand, it adds a new understanding to the related theories about the entrepreneurship of the new generation of returning migrant workers and provides theoretical support for putting forward the specific strategies of entrepreneurship management of this group.

Last but not least, In terms of the practical instruction, aiming at optimizing the diversity structure and taking advantages of the heterogeneous resources, we eventually gain four types of faultline configurations in the new generation of migrant workers' entrepreneurial teams, acting as a basis of making the countermeasures to maximize the information-decision advantages of the faultlines caused by various dimensions of expertise and risk control, and minimized the "group-in" and "group-out" cognitive conflicts caused by the psychological factors including roles, motivations, and cognitive backgrounds. Specifically, we have proposed several concepts like "the guidance mechanism" and "the balance mechanism" to explain why the migrant worker entrepreneurs need an experienced leader/leaders who can utilize his/her/their rich expertise and persuasive authority to guide and instruct other members, as well as balancing the power among subgroups to mediate the potential subgroup polarization and cross-group quarrels which damage the consolidation of the team. Then we have also advocated to watch out the cognitive conflicts based on the difference in gender roles, encouraging team members of different gender roles to respect the equal rights of expressing opinions and making decisions in the entrepreneurial practice, so that more constructive views can help to make reasonable, comprehensive decision in business. From an international perspective, conclusions and implications of our study can also be utilized by migrant worker entrepreneurs planning to start their businesses under similar conditions of member heterogeneity in Southeast Asia, Latin America, Africa, and other developing areas.

Managerial implications

Based on the four types of faultline configurations, the following specific implications are put forward for the management of the returning entrepreneurial team of the new generation of migrant workers in both China and other similar developing areas, where the rapid industrialization shapes the migrant workers' heterogeneous social backgrounds, knowledge and skills, values, and cognitions:

First, the entrepreneurs of the new generation of returning migrant workers should take advantage of the background-experience differences of team members and design appropriate guidance and balance mechanisms. Specifically, returning entrepreneurs ought to build the suitable background-experience type of faultlines in the entrepreneurial team, paying attention to the personnel configuration based on the differentiation of growth background and social experience, as well as giving play to the leading and guiding role of the authoritative subgroups through the application of long-term cognitive reserve to form a cooperation situation in the whole entrepreneurial team where the old ones lead the young ones and the strong ones lead the weak ones, leading to the improvement of the entrepreneurial ability of the team; based on this, make use of the differences in gender preference and risk cognition at the subgroup level to set up a reasonable and effective decision-making balancing mechanism to promote the team's rational decision-making.

In the practice of returning to their hometowns to start a business, as Chinese rural society is deeply influenced by the traditional "society of human relationship" and stereotypes about gender roles, returning entrepreneurs usually choose their hometowns relatives or friends who live together for a long time to form the entrepreneurial team and the members are mostly men. As a result, the entrepreneurial teams of the new generation of migrant workers often have a similar growth background and single-gender composition, lacking the effective "guidance" and "balance" mechanism. In order to change this situation, the new generation of migrant worker entrepreneurs should actively identify and diversify the growth experiences of their relatives and friends in the preparation of the team. For example, they can introduce their elderly male cousins and their town fellow workers with long-term and rich learning and working experience in the cities into the entrepreneurial team, and cooperate with their sisters who have been familiar with rural production and living conditions since a young age. Considering the urban demand, the

team can better adapt to rural production, coordinating supply and demand to make rational marketing decisions and accurate operations in production. In addition, local governments should continue to use economic subsidies and social welfare to encourage migrant workers to return to their hometowns and set up businesses, and focus on introducing the returning elites to the local entrepreneurial teams, and build "the guidance mechanism" in the teams accurately.

Second, returning entrepreneurs should guard against one-sided "efficient" decision-making caused by cognitive convergence. As mentioned above, the lack of guidance and balancing mechanisms will lead to the convergence of decision-making within the entrepreneurial team and the absence of valuable objections, resulting in the illusion of "high efficiency" of entrepreneurial decision-making. The new generation of migrant workers usually maintains a simple democratic decision-making concept of "the minority obeys the majority" in the practice of management. However, there is also a sort of neglect of in-depth attention and analysis of minority opinions. As a management cognitive problem within the entrepreneurial team, the returning entrepreneurial teams should pay attention to the process control of decision-making, especially the communication and control during and after decision-making. Specifically, when making a decision, the decision-maker needs to get rid of the myth of "all agree at one time," avoiding the preset tendency as much as possible, then adopting brainstorming and other methods to emerge all sorts of views, paying attention to the reasonable points of the dissents of minority, so as to prevent from collectively ignoring important issues; after making the decisions, returning entrepreneurs ought to reinforce the monitoring of the decision-making results, such as paying close attention to the changes of quantitative performance such as sales, profits and market share, revealing problems in time and giving feedback, correcting the deviation of irrational decision-making, and preventing the continuous waste of resources. Outside the team, the government should guide all sectors of society strengthening business decision-making by using modern digital technologies such as big data or artificial intelligence to build platforms to support business decision-making, and provide entrepreneurial cases and other information services to enhance the cognitive diversity of the new generation of returning entrepreneurs and to break through the "cognitive cocoon" of decision-making.

Third, coordinate the role-cognition conflict, especially the cognitive differences and conflicts based on gender decision-making. In teams with faultline configuration of role-cognition conflict, due to the absence of authoritative members or subgroups and the high correlation between gender decision-making subgroups and risk preference subgroups, the subgroups with multiple alignments inside are equally sized, and the role conflict is particularly intense. In China's rural context, the stereotype of gender roles will exacerbate the cognitive tear of entrepreneurial teams. On the one hand, the duality and epochal characteristics of the new generation of female migrant workers allow the entrepreneurs to recognize their special advantages in the embedding of industrial networks and to translate them into high entrepreneurial willingness and entrepreneurial action; on the other hand, it reflects that the male returning entrepreneurs still need to get rid of the potential influence of traditional gender notion. Based on this, the male members of the entrepreneurial teams of the new generation of returning migrant workers should change the traditional stereotypes, be open-minded, respect the status and role of female members, and face up to their contribution to the embedding of industrial networks; female entrepreneurial members should make full use of their advantages in the aspect of interpersonal communication, actively coordinating the relations among team members as well as maintaining team cohesion while actively coming up with their unique opinions. At the same time, when there are difficult role-cognition conflicts within the entrepreneurial teams, members can also seek the assistance of external forces of the team and take the introduction of authoritative members as a breakthrough to build a guidance and balance mechanism. For example, governance organizations such as the village committees can take this opportunity to dispatch entrepreneurial assistants or consultants to accurately connect to the problematic teams in order to coordinate role conflicts from outside to inside or from top to bottom and improve the internal relationship of the team.

Fourth, attention should be drawn to the management of information-decision faultlines. From a management practice perspective, the most viable strategy should be to manage the information-related faultlines well, rather than simply avoiding them. Therefore, the task of the new generation of returning migrant workers entrepreneurs is to control the information-decision conflict of subgroups and maximize the resource advantages of information differences: for one thing, the new generation of migrant workers' entrepreneurial teams need to reduce the information-decision differences at the subgroup level, resolving the heterogeneity of knowledge and information to the level of team members, and forming strong diversity under the condition of weak faultlines. This will significantly reduce the polarization and conflict of rival subgroups of a similar size and maintain the diversity of information resources of the team. Therefore, for the staffing of returning entrepreneurial teams, team leaders need to focus on building their teams with unique expertise fields for each member rather than with subgroups of multiple professional fields. For example, a four-person team can have one member who has professional knowledge of management, one member who has manufacturing technology, one member who has network technology knowledge, and one member

who has communication and bargaining skills, rather than being composed of two management professionals and two production and manufacturing personnel. For another thing, they should use various "bridges" to communicate with each information-decision subgroup, emphasizing the cross-border ability of the members and the role of the "new generation migrant workers" identity in breaking the "group-in and group-out" effect and improving the overall consolidation of an entrepreneurial team to form integration at the level higher than the subgroups, and curb the information fragmentation and conflict in the information-decision faultline, enhancing members' willingness to cooperate across subgroups and share the overall risks of the team.

In addition, it should be emphasized here that the problem caused by the information-decision faultlines in the entrepreneurial team of the new generation of migrant workers is essentially the limitation of the choice of professional directions of the new generation of migrant workers when receiving advanced or vocational education, while the root of this limitation lies in the lack of basic education resources received by the new generation of migrant workers and the low ability to absorb knowledge, resulting in their lack of qualification for enrolling in further education. In order to improve the information diversity of the next generation of returning entrepreneurs, it is important to highlight the progress made in the balanced development of urban and rural education and the improvement of the basic education level of the children of the new generation of migrant workers based on further support of the employment and entrepreneurship training policies of the new generation of migrant workers. It is also crucial to increase the targeted enrollment of children of migrant workers in urban public schools and improve the quality of rural teachers, as well as build online educational platforms to share the quality educational resources in both urban and rural areas; migrant workers should be encouraged to involve in all kinds of studies, especially business management, computer science and technology, or other special fields related to rural entrepreneurship to develop more entrepreneurial experts in the new generation of the returning migrant workers to adapt to this digital and knowledge economy age, as well as the strategy of rural revitalization.

Limitations and future works

This article examines and analyzes the impact of team faultline configurations on the entrepreneurial performance of the new generation of migrant workers returning home using the method of qualitative comparative research with fsQCA. Due to the subjective and objective constraints brought by the competence of the researchers, the applicability of methods, and the research object, there is still great room for progress and development in relevant theoretical and empirical research:

Firstly, because of the limited availability of case data, this study only carries out QCA analysis on 32 new generation migrant workers' returning entrepreneurial teams, which affects the external promotion of the empirical results to a certain extent. There are problems of limited diversity worthy of attention as well. Future research can consider expanding the capacity of the cases and further verifying the relevant theoretical research results.

Secondly, this study only focuses on the formation and influence of the faultlines configurations in the new generation migrant workers' returning entrepreneurial teams under the static condition. It also lacks the consideration of the dynamic development of the entrepreneurial teams and the quantitative research on measuring the contribution of various antecedents in the configuration. With the advent of dynamic QCA and NCA research, future research will focus on the use of time-series comparative analysis, qualitative comparative analysis over multiple periods, comparative analysis of necessary conditions, and other methods, combined with Lau and Murnighan's theoretical conception of faultline evolution under the dynamic development of the team, to make a more in-depth exploration on the relationship between the trajectory of the change of faultline configurations and that of the change of entrepreneurial performance in the returning entrepreneurial team of the new generation of migrant workers, as well as the fine-grained analysis of the interaction between various types of faultline configurations and the performance.

In addition, this study chooses the returning entrepreneurial team of the new generation of migrant workers as research object, limiting the theoretical scope for the explanation. Future research will examine whether the conclusions of this study can be extrapolated to other management issues, such as top management teams of listed companies, entrepreneurial teams of college students, etc., which will enhance and practice the universal value of relevant conclusions for management theory.

Finally, in terms of variable selection, the focus of variable selection will gradually change as relevant research develops, moving up from faultlines based on demographic characteristics to faultlines based on complex and abstract criteria such as social niche, cognition, and social capital, which is helpful for researchers and practitioners to understand the subtle role of team heterogeneity on management behavior and results under the complex relationship between human nature and society.

Data availability statement

The original contributions presented in this study are included in the article/**Supplementary material**, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the patients/participants OR patients/participants legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

ZQ contributed to the research designing, data collection, analysis, and writing—original draft. KS contributed to the questionnaire designing, data collection, and reviewing the translating version. NZ contributed to the translation and edited the final draft. TS contributed to the methodology and research guidance, approved the final draft. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

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A framework for antecedents of social entrepreneurial intention: Empirical evidence and research agenda

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Social entrepreneurship (SE) increasingly contributes to diversity in entrepreneurship. The different approaches to SE suggest a variety of antecedents which drive individuals' intention to become social entrepreneurs. While this variety of antecedents is insightful, it also creates a need for systemisation and prioritization. We address this need by introducing an integrative, multi-level framework for person-based antecedents of SE-intention. Based on this multi-level framework the antecedents are grouped on three theoretical levels which refer to an individual's (1) personality, (2) cognition, and (3) entrepreneurial exposition. When testing our framework with 499 South African University students we find support for the multi-level framework and its notion that antecedents from the diverse levels complement each other. Therefore, this study provides a structure for person-based antecedents of SE-intention and additionally points to future research which may extend the proposed framework.

KEYWORDS

social entrepreneurship, social entrepreneur, entrepreneurial intention, antecedents, theory of planned behavior, South Africa

Introduction

Social entrepreneurship (SE) is widely acknowledged as an effective tool to address the increasing discrepancy between the very top and the very bottom of societies (Wilkinson and Pickett, 2009; European Commission, 2013). It works by blending financial and social value creation (Austin et al., 2006), fosters innovation and financial independence of stakeholders (Dupuy et al., 2016) and further positively influences individuals, groups, and societies (Kickul et al., 2018; Cinar, 2019). Due to its benefits, various programmes have been launched to foster social entrepreneurship. The majority of these programmes promotes the individual *intention* to become a social entrepreneur, as this intention is considered the single most important predictor of founding a social enterprise (Hockerts, 2017; Kruse, 2020a).

There is large consensus that SE-intention is strongly driven by person-related antecedents such as values, motives, or personality traits (Sastre-Castillo et al., 2015; Bacq et al., 2016; Saebi et al., 2019). Yet, three central limitations blur this consensus. First, the number of person-based antecedents for SE-intention is enormous and thus difficult to overlook (Nga and Shamuganathan, 2010; Wachner et al., 2015; Kruse, 2020a). In fact, the large quantity of antecedents impedes navigation through the field and further bares the risk of an "inability to build cumulative knowledge" (Venkataraman, 1997; p. 135). Second, most of the studies investigating antecedents of SE-intention focus on a single theoretical model (Short et al., 2009; Sassmannshausen and Volkmann, 2018). It goes without saying that SE is an interdisciplinary phenomenon and thus various theoretical models have to be considered conjointly to understand its antecedents. Finally, there is—at least to our knowledge—no agenda that specifically guides future *empirical* research on antecedents of SE-intention, a circumstance that clearly impedes progress in the field. In essence, SE-research seems to lack (i) an integrative framework of person-based antecedents of SE-intention which is (ii) empirically supported and allows deriving (iii) a distinct research agenda for future studies in the field.

The significance of this study is threefold. First, as research matures in social entrepreneurship, greater attention to theory building regarding its antecedents becomes a priority. Theory building enhances the field and is best done when drawing on systemised and structured knowledge (Shepherd and Suddaby, 2017). Currently, a systemised and structured overview of person-based antecedents regarding SE-intention is missing, preventing advancements in theory building. This study presents a theoretically grounded systematization of person-based antecedents of SE-intention and thus helps to enable theory building in the field. More detailed, it systemises the most prominent person-based antecedents alongside the distal-proximal-motivation framework of Kanfer (1990) and assigns them to the level of personality, cognition, or entrepreneurial exposition.

Second, this study offers an empirical validation of the systematization framework according to which the antecedents are structured. Thus, it goes beyond sheer theoretical reasoning and suggests that the person-based antecedents of SE-intention are indeed grouped on different levels. More detailed, a large-scale sample of South African students shows that antecedents from different levels complement each other when predicting a person's intention to launch a social enterprise.

Finally, this study enhances theory building by identifying three particularly promising streams for future (empirical) SE-intention research which are derived on the basis of this study's empirical insights. In fact, we derive specific research questions which are thought to inspire future theory and research on SE.

Theoretical background

Social entrepreneurship as a new form of entrepreneurship

Social entrepreneurship (SE) is considered a new form of entrepreneurship which deliberately incorporates a social mission into a business model (Austin et al., 2006; Wry and York, 2017). The social mission can be diverse and includes but is not limited to alleviating poverty or integrating marginalized groups into the labor market (Perrini et al., 2010; Mittermaier et al., 2021). As both—the social mission and the income-oriented business model—are combined, social enterprises are also referred to as hybrid enterprises (Tracey and Phillips, 2007; Kruse et al., 2021). Importantly, while acting on a social mission is possible for any business, including for-profit and non-profit enterprises (Borzaga and Santuari, 2003), social enterprises focus on self-financing their social actions and on remaining independent from political or private donations. As a result, social enterprises are likely to be perceived as apolitical and more sustainable than for instance NGOs. This is a major advantage as political neutrality helps to avoid governmental interference (Dupuy et al., 2016) and higher sustainability supports the enterprise's independence even in times of crises like the COVID-19 pandemic when donations are commonly cut down (Branas-Garza et al., 2020).

In essence, SE can be conceptualized as a new, hybrid form of entrepreneurship which combines the fulfillment of a social mission with the aspiration to generate monetary profit and to self-finance the social actions (Kruse et al., 2021). Therefore, SE is largely seen as a hybrid form of entrepreneurship bridging the gap between for-profit-only enterprises and traditional NGOs (Lepoutre et al., 2013). The increasing interest in social enterprises builds on their great potential to contribute to a more just and equal society.

Social entrepreneurial intention

Behavioral intentions are the single most important predictors of any planned behavior and explain about 28% of its variance (Sheeran, 2002). Importantly, this also holds true for the entrepreneurship context where a clear link between entrepreneurial intention and action was found (Kautonen et al., 2015). While entrepreneurial intention is an important prerequisite of entrepreneurial activity (Krueger and Brazeal, 1994; Kolvereid and Isaksen, 2006), *social* entrepreneurship intention determines *social* entrepreneurship activity. In this regard, social entrepreneurial intention refers to a person's determination to plan a new social business and to consciously set it up at some point in the future (Thompson et al., 2000).

Whether individuals intend to become a social entrepreneurs strongly relies on their person-based characteristics such as personality traits, cognitive skills, or individual values (McClelland, 1961; Steward, 1996). Two strategies have been applied to pin down person-based antecedents of SE-intention. First, antecedents are derived from theoretical models transferred from other disciplines to the field of SE. An example thereof is the Theory of Planned Behavior (Ajzen, 1991) which is used in but not limited to the context of entrepreneurship. Second, antecedents are drawn from theoretical models specifically developed for SE. An example thereof is the Model of Social Entrepreneurial Intention Formation by Mair and Noboa (2006) which was specifically developed for the context of social entrepreneurship. Subsequently, we summarize the most prominent person-based antecedents of SE-intention alongside the theoretical models they originate from and finally structure them according to a new integrative, multi-level framework.

Person-based antecedents of SE-intention and the theories they originate from

SE-intention antecedents proposed by the theory of planned behavior

The TPB (Ajzen, 1991) is one of the most wide-spread theories to predict entrepreneurial intention and behavior (Chipeta et al., 2016; Gorgievski and Stephan, 2016). According to the theory's assumption, any planned behavior relies on the intention to perform it. In the context of SE, intention formation is thought to be influenced by (1) attitudes toward SE, (2) subjective norms regarding SE, and (3) perceived behavioral control. According to Ajzen (1991), a negative attitude toward SE describes the negative evaluation of becoming a social entrepreneur and will decrease the probability of becoming one, whereas a positive evaluation will increase this probability. Subjective norms reflect normative beliefs that signify the influence of others on personal decisions in personal life. For instance, if friends approve SE-activities then the probability of performing these activities will increase. Finally, perceived behavioral control refers to a person's self-efficacy to successfully perform entrepreneurial behavior and to its perceived controllability. Thus, perceived behavioral control is high if individuals consider themselves capable of starting and managing a social enterprise and if they see themselves capable of controlling relevant aspects. Recent empirical findings demonstrate that the antecedents postulated by the TPB are valid in the SE-context and influence a person's intention to found a social enterprise even across different cultures and economic circumstances (Yang et al., 2015; Cavazos-Arroyo et al., 2017; Tiwari et al., 2017).

Important for this study, the TPB suggests a so-called "thinking–doing link" (Mitchell et al., 2007) and thus stresses a cognitive approach to entrepreneurship. Accordingly, in order to *do* something individuals have to *think* of their actions beforehand. Naturally, this approach highlights the individual thinking and decision-making processes (Mitchell et al., 2002) which is why all antecedents derived from the TPB are considered as *cognitive antecedents* of SE-intention.

SE-intention antecedents proposed by the model of social entrepreneurial intention formation

A second approach frequently applied in SE is the Model of Social Entrepreneurial Intention Formation by Mair and Noboa (2006). This model suggests that empathy, moral judgement, self-efficacy, and social support are direct antecedents of SE-intention which, in turn, triggers actions relevant to found a social enterprise. While *empathy* refers to the ability to cognitively understand and affectively share the emotional situation of others, *moral judgement* denotes the motivation to help others to create a common good. Both, empathy and moral judgement, enhance the attractiveness of careers in SE and in turn increase the intention to pursue such careers. Additionally, *self-efficacy* describes the conviction of being able to found a social enterprise while *social support* refers to the expected help of others when striving for a career in SE. Conjointly, self-efficacy and social support increase a person's conviction to successfully perform as a social entrepreneur. In line with the model's assumption, all four antecedents directly predict the intention to found a social enterprise (Bacq and Alt, 2018; Dickel and Eckardt, 2020).

Similar to the TPB, Mair and Noboa's model highlights the cognitive elements of SE-intention. Important for this study, while the TPB explains the intention formation processes in a wide variety of settings but is not limited to the social entrepreneurial one, Mair and Noboa's model is exclusively developed for *social* entrepreneurship. Therefore, it includes only those antecedents which are thought to be of relevance for nascent social entrepreneurs. Due to the cognitive nature of the antecedents proposed by Mair and Noboa, we also see them as cognitive antecedents, yet we account for their conceptual proximity to SE-intention which is why we consider them as SE-specific or so-called *second-level* cognitive antecedents.

SE-intention antecedents proposed by the basic human values theory

The Basic Human Values Theory of Schwartz (1992, 2003) is the third theoretical approach frequently used to describe antecedents of SE-intention. Accordingly, differences in people's values are responsible for their varying professional goals and varying intention to pursue a SE career. Schwartz distinguishes

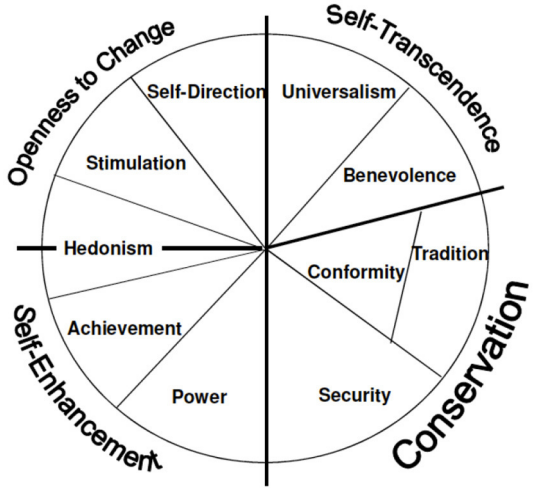

FIGURE 1
The integrated structural model of personal values (Schwartz, 2003).

ten values which are arranged in a circular model according to their similarity. More similar values are located more closely to each other and are grouped into one of the following higher-order values: (1) self-transcendence, (2) openness to change, (3) conservation, and (4) self-enhancement (Figure 1).

The higher-order value *self-transcendence* refers to benevolence and universalism and emphasizes the importance and willingness to help others. As social entrepreneurs aim at creating value to fight social challenges (Austin et al., 2006; Mair and Marti, 2006), self-transcendence values are meant to foster SE-intention. *Openness to change* refers to self-direction and stimulation as open persons enjoy free thinking, are innovative, and seek new experiences. Because this kind of self-direction and stimulation is prototypical for entrepreneurial tasks, *openness to change* is also meant to enhance SE-intention. *Conservation* describes a person's aspiration to maintain the status quo, preserve traditions, and live a secure life. This value opposes entrepreneurial tasks which commonly include risk-taking, breaking with tradition, and exploiting novel opportunities. Consequently, individuals who express high conservation values presumably express reduced SE-intention. A similar logic applies to Schwartz's last higher-order value. *Self-enhancement* refers to an individual's aspiration to reach goals which strongly match personal interests. As the focus on self-interest and personal achievement opposes the social entrepreneurs' mission to create social value, a high level of self-enhancement should impede the intention to pursue a career as social entrepreneur. In line with this reasoning, there is growing evidence that all four integrated values are valid antecedents of an individual's SE-intention (Sastre-Castillo et al., 2015; Kruse et al., 2019).

Importantly but in contrast to the previous models, Schwartz's model does not refer to cognitive antecedents of SE-intention. As values rather reflect the personality than the cognition of (nascent) social entrepreneurs we refer to them as personality-driven antecedents. Personality-driven antecedents are commonly regarded as more distal, exerting their influence on SE-intention *via* the more proximal cognitive antecedents (Kanfer, 1990), a proposition that was recently confirmed in the context of SE (Kruse et al., 2019).

Next to the three models summarized above, there are several single-constructs which are regularly discussed as important antecedents of SE-intention. These include the personality traits proactivity, risk-taking, and altruism as well as the experience-based antecedents SE-knowledge and SE-experience. These single-construct antecedents are subsequently outlined and their relation to the previously listed antecedents is discussed.

Single-construct antecedents of SE-intention

Proactive personality

Bateman and Crant (1993) define proactive personality as a "relatively stable tendency to affect environmental change" (p. 103). People who are proactive consider themselves as change agents who actively shape their environment instead of passively waiting for change to happen. Proactivity is considered an important antecedent of SE-intention, as it was repeatedly linked to persons' intention to become a traditional entrepreneur (Crant, 1996; Prabhu et al., 2012), entrepreneurial outcomes (Kickul and Gundry, 2002) and *social* entrepreneurship intention (Chipeta et al., 2016, 2022). As proactivity is a relatively stable personality trait and thus similar to Schwartz's values it will also be considered a personality-driven antecedent.

Risk-taking

Risk-taking is a key element in entrepreneurship and meta-analytic findings show that those who are more willing to take risks report stronger entrepreneurial intention (Rauch and Frese, 2000; Simon et al., 2000). Compared to traditional entrepreneurship, risk-taking should be even more important in SE as social entrepreneurs bare the risk of failing twice—financially and in their social mission. While traditional entrepreneurs deal with financial risks alone (Dorado, 2006; Zahra et al., 2009; McCaffrey, 2018), social entrepreneurs also have to deal with high moral standards (Johnson, 2000; Wasilczuk and Łuński, 2014) which bare an enormous risk to backfire even when only slightly bent for the benefit of financial goals (Palmer et al., 2019). Consequently, SE is closely tied to risk-taking for why individuals with higher willingness to take risks should also be more drawn to careers in SE and should thus express higher SE-intention. Given that risk-taking is largely considered as a personality trait, we take the view that

risk-taking is on the same conceptual level as proactivity and Schwartz's personality-driven values. Thus, it is an antecedent on the personality level.

Altruism

Altruism is the tendency to generously and kindly help others without or with low-scale external incentives (Rushton et al., 1981). Altruistic reasoning was spotted as a strong motivational driver for SE (Mair and Marti, 2006) and is further regarded as one of the most important traits of social entrepreneurs (Tan et al., 2005). Similar to risk-taking, proactivity and Schwartz's values, altruism is considered a relatively stable and rather general personality trait. Consequently, it also represents the personality level of antecedents.

SE-knowledge and SE-experience

Knowledge about and experience with certain careers prevent from unrealistic career expectations (Gati et al., 1996) and facilitate career decisions (Lease, 2004). This holds also true for the field of SE and turns the business experience as well as experience with social problems into relevant antecedents of SE-intention (Hockerts, 2017; Bacq and Alt, 2018). Consequently, knowledge about and experience with SE will be considered as important drivers for SE-intention in this study. However, compared to the previously mentioned cognitive and personality-related antecedents, SE-knowledge and experience are highly specific for SE and provide the most detailed information on a future career as a social entrepreneur. Therefore, we take the view that knowledge and experience are very proximal antecedents of SE-intention with a larger effect on SE-intention than the previously presented antecedents on the personality and cognitive level.

A multi-level framework for systemising antecedents of SE-intention

As shown, entrepreneurship research provides a rich diversity of antecedents for SE-intention. Although this diversity is fruitful for the development of SE theory (Osiri et al., 2019), it also impedes navigation through the field which bares the risk of an inability to create cumulative knowledge for theory building (Venkataraman, 1997). While this risk was generally spotted in entrepreneurial research—independent of whether the focus was set on social or general entrepreneurship—effort to address it was primarily put into *general* entrepreneurship (see Gorgievski and Stephan (2016), Zhao et al. (2010), and Alferaih (2017) for notable examples). In contrast and according to recent research (Weerakoon, in press), the effort for systemising antecedents of *social* entrepreneurship falls comparably short.

The main reason why antecedents of SE-intention still lack systematization might lie in the fundamental disparities between general and social entrepreneurship which directly affect the motivational drivers thereof (see Austin et al. (2006) for an overview). Keeping in mind that social and general entrepreneurship differ and that their person-based intentional drivers differ, makes a sheer adaption of findings from general to social entrepreneurship inappropriate. Findings by Wach et al. (in press) strengthen this argument and show substantial differences in person-based antecedents of the intention to launch a general vs. social enterprise. These differences are particularly clear when it comes to personal attitudes or perceived behavioral control and appear to be globally present as they were found in different cultures. Consequently, we build on this research demonstrating that the person-based antecedents for general vs. social entrepreneurial intention differ and argue that it is thus necessary to offer a systematization framework particularly derived for antecedents of SE-intention. In fact, a structured framework allows for more detailed insights on whether antecedents are unique or redundant, complement each other or trigger each other in a processual manner. To structure the drivers of SE-intention we apply the distal-proximal-motivation framework of Kanfer (1990). This particular framework was used because it validly groups motivational antecedents (Diefendorff and Chandler, 2011), is meaningful in the setting of SE, and helps following a recent call for more systematization of antecedents in SE (Saebi et al., 2019).

In line with Kanfer (1990), we suggest that SE-intention is influenced by antecedences which can be organized according to their *conceptual proximity* to entrepreneurial actions. Proximal antecedents are narrowly defined and SE-specific. They shape a person's wish to pursue a career in SE and help to set the stage for actions in SE. In contrast, distal antecedents are more broadly defined and rather unspecific which is why they are important for a wide variety of settings including but not limited to SE. Distal antecedents exert their impact often rather indirectly through more proximal ones which is why their direct link is commonly weaker (Judge et al., 2009). Important for this study, both, more proximal and distal antecedents predict a person's intentional level *separately*. However, considering proximal and distal antecedents *conjointly* should result in the most accurate prediction of a person's SE-intention. Figure 2 depicts the antecedents of SE-intention grouped according to the distal-proximal-motivation framework.

The most distal level integrates all of Schwartz's personal values as well as the personality traits proactivity, risk-taking, and altruism. We will refer to it as the *personality level*. According to Bergner (2020), the personality of an individual reflects "the enduring set of traits and styles that he or she exhibits" (p. 4). Consequently, the common core of antecedents on the personality level is that they are relatively stable across time and situations and are usually not bound to a certain career context. They are rather distal and shape a person's career intention in diverse settings including but not limited to SE. For example, a person scoring high on the value self-transcendence

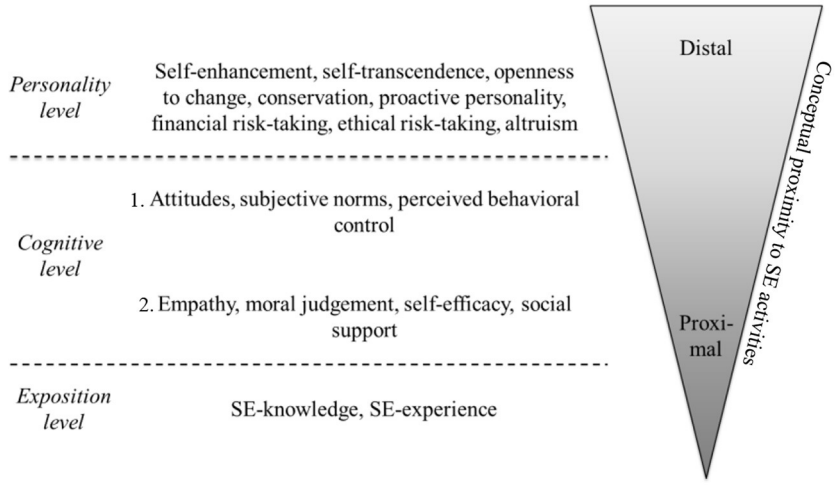

FIGURE 2
Arrangement of hypothesized Antecedents of SE-intention based on their conceptual Proximity to SE Activities. As the constructs empathy, moral judgement, self-efficacy, and social support are elements of the SE-specific model by Mair and Noboa (2006), they are perceived to be more proximal than the TPB-components attitudes subjective norms and perceived behavioral control which are applicable to a wide range of different behaviors.

will probably favor a job with social and caring tasks. However, this could result in the intention to become a social entrepreneur but also in the wish to work as a caregiver, social worker or teacher. Thus, the antecedents on the personality level drive career intentions in a rather broad and general way and compared to antecedents on the cognitive level, which are presented next, they (i) do not involve a *mental* or *intellectual* reflection of career options and (ii) are less prone to change as a result of one's own thinking process, for instance when acquiring more information about alternative career tracks (see Hueso et al. (2020) for an overview in the entrepreneurship context). In brief, antecedents on the personality level are understood as enduring, innate socio-emotional characteristics of a person.

The next level of our integrated, multi-level framework refers to antecedents of SE-intention on the *cognitive level* and comprise the components of the TPB and the model proposed by Mair and Noboa. Antecedents of this level denote a person's cognitive effort to evaluate the attractiveness of a career as social entrepreneur. As this evaluation involves critically questioning the specific tasks of social entrepreneurs and challenging one's own capabilities to successfully complete them, there is a certain proximity to the SE-intention formation process. In fact, initial empirical findings provided by Kruse et al. (2019) suggest that cognitive antecedents of SE-intention are more proximal than antecedents on the personality level. Important for this study, we see a difference between the antecedents derived from the TPB and the model by Mair and Noboa which is why we distinguish a first *and second cognitive level*. The antecedents of the TPB are applicable to a wide range of planned behaviors including but not limited to entrepreneurship and are thus more distal to SE-actions. Therefore, they are considered as antecedents on the more distal, first cognitive level. In contrast, the model of Mair and Noboa comprises solely SE-specific antecedents with a high proximity to SE-actions. Therefore, they are considered as antecedents on the more proximal, second cognitive level.

The final set of antecedents for SE-intention refers to the amount of SE-knowledge and SE-experience. It is termed the *exposition level*. The antecedents on this level are all directly linked to the targeted intention and include the active gain of SE-relevant knowledge and experience. Importantly, this knowledge and experience goes beyond the sheer cognitive assessment of an SE-career, which is reflected on the cognitive level. Consequently, the exposition level is the most proximal one.

Based on Kanfer's (1990) distal-proximal-motivation framework we propose that more proximal antecedents are not only more strongly tied to SE-intention, but also enhance the prediction of more distal ones. Translating this assumption to an empirical level means that more proximal antecedents should add incremental validity over more distal ones when predicting the intention to become a social entrepreneur. Thus, the following hypotheses (H) are stated:

H_1: Antecedents on the personality level (self-enhancement, self-transcendence, openness, conservation, proactivity, risk-taking, altruism) significantly predict SE-intention.

H_2: Antecedents on the cognitive level 1 (attitude toward SE, subjective norms, perceived behavioral control) incrementally predict SE-intention beyond the antecedents of the personality level.

H_3: Antecedents on the cognitive level 2 (empathy, moral judgement, self-efficacy, social support) incrementally predict

SE-intention beyond the antecedents of the personality and cognitive level 1.

H_4: Antecedents on the exposition level (SE-knowledge and SE-experience) incrementally predict SE-intention beyond the antecedents of the personality, cognitive 1, and cognitive 2 level.

Methods

Data acquisition and sample

In total, 499 participants (55% female) with a mean age of 22 years ($SD = 2.58$) provided data in this study. Overall, the participants were between 17 and 35 years old ($M = 21.53$, $SD = 2.58$), 74% reported having a Black/African background whereas 10% had an Indian, 10% a White/European, 5% a Colored, and 1% a Chinese ethnical background. The majority of the participants were undergraduates (91%). Participation was voluntary, anonymous, and not incentivised.

The data was collected using a paper-pencil questionnaire which was distributed in undergraduate courses of a university in Johannesburg. Notably, the South African sample is a clear benefit for research on SE. First, it allows examining the SE-intention in a country with one of the highest SE-activity rates. Second, it represents a non-western entrepreneurial mind-set and thus increases the generalizability of findings on SE-intention which mainly build on western samples (Steckler and McLeroy, 2008; Campbell and Stanley, 2015).

Measures

SE-intention as the criterion of interest

SE-intention is defined as the aspiration to found a social enterprise in one's professional career. It was measured using the Social Entrepreneurial Intention Scale of Kruse et al. (2018) where participants rate six items on a 7-point-Likert scale ranging from 1 ("not at all") to 7 ("very much"). The following item is a sample: "I have the intention to found an enterprise that combines a social mission and an elaborated income strategy". In this study the scale's internal consistency was 90.

Person-based antecedents of SE intention

Antecedents on the personality level

Antecedents on the personality level include the Schwartz values self-enhancement, self-transcendence, openness, and conservation and the single-construct antecedents proactivity, risk-taking, and altruism.

The Schwartz values *self-enhancement, self-transcendence, openness, and conservation* were measured using the Portrait Value Questionnaire that subsumes 19 statements which represent other people's goals in life (PVQ; Schwartz, 2003). Participants have to rate the extent to which these goals fit their own ones by using a 6-point Likert scale ranging from 1 ("not like me at all") to 6 ("very much like me"). Four items represent the *self-enhancement* subscale which denotes the aspiration to achieve challenging goals and gain power in one's life ($\alpha = 0.64$; sample item: "Being very successful is important to him. He likes to impress other people"). The subscale *self-transcendence* was measured by five items and refers to the aspiration to help other people and to be benevolent ($\alpha = 0.68$; sample item: "She thinks it is important that every person in the world is treated equally. She wants justice for everybody, even for people she doesn't know"). The subscale *openness to change* refers to the aspiration to think freely and to be innovative and was measured with four items ($\alpha = 0.62$; sample item: "It is important to him to make his own decisions about what he does. He likes to be free and not depend on others"). Finally, the five-item subscale *conservation* denotes the aspiration to keep the status quo, preserve law and order, and live a secure life ($\alpha = 0.62$; example item: "She believes that people should do what they're told. She thinks people should follow rules at all times, even when no-one is watching").

Proactive personality refers to the disposition to act as a change agent and affect one's environment. It was measured using the Proactive Personality Scale by Bateman and Crant (1993) which consists of five items ($\alpha = 0.83$). Participants rate their level of agreement on a 7-point-Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). The following is a sample item: "I can spot a good opportunity long before others can".

Risk-taking was measured with the subscales (i) financial and (ii) ethical risk-taking of the Domain-Specific Risk-Taking Scale (DOSPERT; Blais and Weber (2006). Participants indicated the probability to perform certain actions on a 7-point-Likert scale ranging from 1 ("extremely unlikely") to 7 ("extremely likely"). *Financial risk-taking* defines the willingness to invest money in a risky manner and was assessed with three items ($\alpha = 0.74$; sample item: "Investing 10% of your annual income in a new business venture"). *Ethical risk-taking* describes the willingness to perform actions widely considered as immoral and was measured with six items ($\alpha = 0.72$; sample item: "Not returning a wallet you found that contains $200").

Altruism denotes the disposition to help others despite no or just minimal external incentives. It was measured using the Altruism Scale by Rushton et al. (1981) which asks study participants to indicate the frequency of six behavioral items ($\alpha = 0.70$). Answers were provided on a 5-point-frequency scale ranging from 1 ("never") to 5 ("very often"). The following is a sample: "I have donated goods or clothes to a charity".

Antecedents on the first cognitive level

Antecedents on the first cognitive level include all components of the TPB attitudes. *Attitudes toward social entrepreneurship*, *subjective norms, and perceived behavioral control* were assessed using the Entrepreneurial Intention Questionnaire (EIQ) by Liñán and Chen (2009) in its adapted

version for social entrepreneurship (Kruse, 2020a). Participants had to rate their agreement to various statements using a 7-point-Likert scale from 1 ("strongly disagree") to 7 ("trongly agree"). *Attitudes toward social entrepreneurship* reflect the attitudes toward social entrepreneurship and are measured with five items ($\alpha = 0.88$) such as "Being a social entrepreneur implies more advantages than disadvantages to me". *Subjective norms* refer to the social pressure of trusted ones when it comes to the personal goal of becoming a social entrepreneur. It was measured with four items ($\alpha = 0.82$) similar to this example item: "If I decided to create a social enterprise, my close family would approve of that decision". Finally, *perceived behavioral control* describes the extent to which a person believes to perform as and control the process of becoming a social entrepreneur. It was assessed with six items ($\alpha = 0.90$) similar to the following: "To start a social enterprise and keep it working would be easy for me".

Antecedents on the second cognitive level

Antecedents on the second cognitive level include all components of Mair and Noboa's (2006) Model of Social Entrepreneurial Intention Formation. *Empathy, moral judgement*, *self-efficacy*, and *social support* were measured using the Social Entrepreneurial Antecedents Scale by Hockerts (2015). Participants provided their agreement regarding various statements using a 5-point-Likert scale varying from 1 ("strongly disagree") to 5 ("strongly agree"). *Empathy* describes the ability to cognitively understand others and emotionally share their feelings. It was assessed by six items ($\alpha = 0.77$) similar to the following: "When thinking about socially disadvantaged people, I try to put myself in their shoes". *Moral judgement* refers to the motivation to help others achieving a common goal and was measured with four items ($\alpha = 0.81$; sample: "It is an ethical responsibility to help people less fortunate than ourselves"). *Self-efficacy* denotes the conviction that one is able to found and successfully run a social enterprise. It was measured with four items ($\alpha = 0.68$) similar to the following: "I am convinced that I personally can make a contribution to address societal challenges if I put my mind to it". Finally, *social support* describes the degree to which a person thinks that others support his/her aspiration to act as a social entrepreneur. It was assessed with four items ($\alpha = 0.65$; sample: "People would support me if I wanted to start an organization to help socially marginalized people").

Antecedents on the Exposition Level

Antecedents on the exposition level include knowledge and experience in the context of social entrepreneurship. *SE-knowledge* describes the extent to which a person is familiar with the concept of social entrepreneurship as a career option. It was assessed with three items ($\alpha = 0.77$) particularly developed for this study which are rated on a 7-point-Likert scale ranging from 1 ("not at all") to 7 ("very much"). The following is a sample item: "I had been familiar with the term "social entrepreneur" before participating in this study". *SE-experience* refers to the degree to which a person has already gained practical insights in the field of SE. It was measured with five items ($\alpha = 0.88$) particularly developed for this study which had to be rated on the same Likert-scale. An example item is "I have already gained practical experience in the field of social entrepreneurship (e.g., during an internship)".

Control variables

Sociodemographic variables impact the intention to found a social enterprise. For instance, women express higher SE-intention compared to men (Chipeta et al., 2020). Also, age and education level have been shown to affect the SE-intention formation process (Wachner et al., 2015). Consequently, we included sex, age, and educational level as controls. Furthermore, due to the ethnic diversity in South Africa (Rivera-Santos et al., 2015), the participants' ethnicity was also included as a control variable.

Analysis strategy

To test our hypotheses, we conducted hierarchical regressions on the participants' intention to become a social entrepreneur using the software IBM SPSS 25. The control variables (age, sex, educational level, ethnicity) were entered in the first model. Subsequently, we arranged the person-based antecedents according to our multi-level framework of Figure 2 and added the antecedents on the personality level (model 2), the antecedents of the first cognitive level (model 3), the antecedents of the second cognitive level (model 4), and finally the antecedents of the exposition level (model 5).

Results

Preliminary analyses

Before testing the hypotheses, requirements for the hierarchical regressions and common method bias were checked. With respect to the statistical requirements, we visually inspected the histograms of all variables which confirmed the normality of the data and supported the use of a hierarchical regression analysis (West et al., 1995). Common method bias was investigated using a single factor test (Fuller et al., 2016). Studying all items conjointly in a factor analysis and limiting the number of extracted factors to just one, resulted in 16.45% of explained variance. As this level of explained variance is well below the suggested threshold of 50% (Podsakoff and Organ, 1986), there was no need to account for the common method bias in our analyses. Finally, we checked whether multicollinearity was an issue in our sample (Farrar and

Glauber, 1967). The Variance Inflation Factors (VIF) ranged from 1.19 for risk-taking to 2.18 for self-enhancement and were all below the threshold of VIF = 4.00 (O'Brien, 2007). Thus, it was assumed that multicollinearity does not systematically bias the subsequent analyses.

Descriptive analysis and bivariate correlations

The descriptive results and bivariate correlations of all study variables are displayed in Table 1. The intention to become a social entrepreneur most strongly relates to self-efficacy ($r = 0.38$, $p < 0.01$), attitude toward SE ($r = 0.37$, $p < 0.01$), self-transcendence ($r = 0.35$, $p < 0.01$), and moral judgement ($r = 0.34$, $p < 0.01$). Importantly, SE-intention relates to the respective antecedents only in a positive manner. Concerning the inter-correlations of the antecedents, small to medium-sized values were found.

Hierarchical regression analysis

Table 2 shows the results of the hierarchical regression analyses. To examine the hypotheses, the incremental value between the separate regression steps is considered. In the first step of the hierarchical regression, the control variables were entered. In a second step, the most distal antecedents—those on the personality level—were added. We found a significant change in R^2 after including the antecedents of the personality level (model 2: $\Delta R^2 = 0.17$, $p < 0.01$) when predicting a person's SE-intention. Thus, H_1 is confirmed.

In a next step, the antecedents of the first cognitive level were added which led to another significant increase in the amount of explained variance (model 3: $\Delta R^2 = 0.05$, $p < 0.01$). Therefore, H_2 is also confirmed, and the prediction of a person's SE-intention is improved by adding antecedents of the first cognitive level to those of the personality level. Subsequently, including the more proximal antecedents of the second cognitive level resulted in a further increase of explained variance (model 4: $\Delta R^2 = 0.05$, $p < 0.01$) and offered support for H_3.

Finally, adding the antecedents of the most proximal level in model 5, the exposition level (SE-knowledge and SE-experience), did not result in an increase of explained variance. Thus, the prediction of a person's SE-intention cannot be further improved by adding antecedents of the exposition level to those of the previous levels. Therefore, H_4 was not supported. When all antecedents were considered conjointly, 26% of the variance in a person's SE-intention was explained.

Discussion

This study provides three main results. First, it demonstrates that the manifold person-based antecedents of SE-intention can be structured using a multi-level framework which differentiates them according to their conceptual proximity to entrepreneurial intentions. Applying this framework offers a way to systemise and integrate the rather fragmented research body of antecedents of SE-intention. Second, this study initially validates the multi-level framework by empirically supporting its underlying assumptions in a country known for its lively SE community. Third, this study's findings clearly suggest an agenda for future research when it comes to antecedents of SE-intention which is subsequently outlined.

Assessment of a multi-level framework for antecedents of SE-intention

Our findings reveal that Kanfer's (1990) distal-proximal-motivation logic is an eligible basis to structure the most frequently discussed person-based antecedents of SE-intention. In fact, all frequently studied antecedents could be integrated. Importantly and anew, our findings suggest that the person-based antecedents represent four quite diverse categories which differ regarding their proximity to SE-intention. Moreover, our findings offer an initial explanation for why some antecedents are more strongly linked to SE-intention than others as it seems to be the relative proximity to SE-intention that affects the empirical link between the antecedents and SE-intention.

To validate the multi-level structure of our newly proposed framework, we used hierarchical regressions and analyzed a large South African sample. Our hypotheses 1–3 suggested that (i) simultaneously considering antecedents of different proximity levels provides better prediction of SE-intention and (ii) that antecedents of the personality, first and second cognitive level each bear information about a person's intention to become a social entrepreneur which is not provided by antecedents of the other proximity levels. Including the antecedents of the personality level, first cognitive level, and second cognitive level repeatedly resulted in an increase of explained variance in SE-intention and confirmed hypotheses 1–3.

Regarding our empirical findings, hypothesis 4 was not supported and antecedents on the exposition level did not enhance the prediction of SE-intention. One reason therefore might be found in research on general entrepreneurship, where previous entrepreneurial exposure is also regarded as an important facilitator for entrepreneurial intention. However, the effect of work experience in a small or newly founded firm on entrepreneurial intention is mediated by positive attitudes toward entrepreneurial careers and perceived behavioral control (Zapkau et al., 2015). Correlations from Table 1 indicate a

TABLE 1 Means, standard deviations, and inter-correlations of all constructs included in the study ($N = 499$).

Scale	Mean (SD)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Age	21.00 (2.58)	−0.07	0.33**	−0.16**	0.13**	0.01	0.15**	−0.02	0.05	0.06	0.01	−0.15**	−0.04	0.00	−0.11**	0.08	0.07	0.00	0.02	0.15**	0.06	0.03
2. Sex	1.55 (0.05)		0.04	−0.05	−0.01	0.00	−0.07	0.23**	0.13**	0.07	0.03	07	0.17**	0.04	0.14	0.03	−0.18**	−0.24**	0.17**	−0.03	−0.06	0.13**
3. EDU	1.13 (0.49)			−0.01	0.13**	0.09	0.16**	0.03	0.07	0.07	0.09*	−0.11*	0.01	−0.01	−0.03	0.03	0.00	0.03	0.06	0.09*	0.02	0.06
4. ETH	1.53 (1.02)				−0.04	0.01	0.01	−0.05	−0.06	−0.03	0.06	0.08	−0.02	−0.06	−0.02	−0.11*	−0.09	0.03	0.06	0.04	0.02	−0.03
5. ATT	4.44 (1.40)					0.45**	0.56**	0.23**	0.31**	0.29**	0.23**	0.05	0.30**	0.22**	0.17**	0.31**	0.21**	−0.02	0.19**	0.28**	0.35**	0.37**
6. SN	5.19 (1.22)						0.31**	0.17**	0.24**	0.25**	0.33**	0.02	0.25**	0.22**	0.08	0.27**	0.09*	−0.05	0.17**	0.11*	0.17**	0.18**
7. PBC	3.50 (1.33)							0.03	0.19**	0.23**	0.24**	0.13**	0.18**	0.29**	0.14**	0.40**	0.22**	0.08	0.24**	0.44**	0.50**	0.27**
8. EP	4.08 (0.72)								0.47**	0.49**	0.25**	−0.02	0.47**	0.24**	0.18**	0.15**	0.14**	−0.32**	0.26**	0.03	−0.03	0.31**
9. MJ	3.93 (0.79)									0.30**	0.26**	0.06	0.40**	0.16**	0.31**	0.24**	0.13**	−0.15**	0.27**	0.11*	0.10*	0.34**
10. SE	3.98 (0.67)										0.35**	0.05	0.42**	0.33**	0.17**	0.35**	0.23**	−0.18**	0.21**	0.14**	0.03	0.38**
11. SS	3.50 (0.66)											0.10*	0.25**	0.17**	0.15**	0.29**	0.15**	−0.07	0.25**	0.18**	0.12**	0.20**
12. SEH	4.28 (1.00)												0.20**	0.34**	0.36**	0.25**	0.11*	0.17**	0.07	0.09*	0.05	0.04
13. ST	4.98 (0.77)													0.49**	0.49**	0.29**	0.15**	−0.28**	0.27**	0.07	0.02	0.35**
14. OP	4.69 (0.88)														0.25**	0.49**	0.22**	−0.02	0.19**	0.26**	0.18**	0.25**
15. CO	4.37 (0.86)															0.20**	0.02	−0.14**	0.15**	0.03	0.08	0.25**
16. PP	5.10 (1.06)																0.28**	−0.04	0.27**	0.32**	0.29**	0.28**
17. FRT	4.60 (1.37)																	0.13**	0.14**	0.17**	0.12**	0.14**
18. ERT	2.33 (1.08)																		−0.13**	0.03	0.10*	−0.08
19. ALT	3.47 (0.70)																			0.28**	0.22**	0.21**
20. SEK	3.20 (1.60)																				0.61**	0.12**
21. SEE	2.48 (1.45)																					0.12**
22. SEI	5.30 (1.21)																					–

Sex (1= Male; 2 = Female); *EDU*, Educational level (1 = Undergraduates, 2 = Honors, 3 = Masters, 4 = Others); *ETH*, Ethnicity (1 = Black/African; 2 = Other); *ATT,* Attitude toward SE; *SN,* Subjective Norms; *PBC*, Perceived behavioral control; *EP*, Empathy; *MJ,* Moral Judgement; *SE*, Self-Efficacy; *SS*, Social Support; *SHE,* Self-Enhancement; *ST*, Self-Transcendence; *OP,* Openness; *CO,* Conservation; *PP*, Proactive Personality; *FRT*, Financial Risk-Taking; *ERT*, Ethical Risk Taking; *ALT*, Altruism; *SEK*, SE-Knowledge; *SEE*, SE-Experience; *SEI*, SE-intention; *SD*, Standard deviation.

* $p < 0.05$; ** $p < 0.01$.

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TABLE 2 Summary of the hierarchical regression analysis ($N = 499$).

Level	Constructs	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)
Control variables	Age	0.01	0.01	−0.02	−0.02	−0.02
	Sex	0.13**	0.09	0.09*	0.08	0.08
	Education	0.05	0.04	0.02	0.01	0.01
	Ethnicity	−0.02	0.01	0.01	0.01	0.01
Personality level	Self–Enhancement		−0.13*	−0.11*	−0.09	−0.09
	Self–Transcendence		0.21**	0.16**	0.07	0.06
	Openness		0.04	0.05	0.04	0.05
	Conservation		0.13**	0.11*	0.10*	0.10*
	Proactive Personality		0.16**	0.11*	0.06	0.07
	Financial Risk–Taking		0.07	0.04	0.01	0.01
	Ethical Risk–Taking		0.05	0.03	0.06	0.05
	Altruism		0.07	0.05	0.02	0.03
Cognitive level I	Attitude toward SE			0.24**	0.20**	0.20**
	Subjective Norms			−0.04	−0.06	−0.06
	PBC			0.05	0.05	0.06
Cognitive level II	Empathy				0.05	0.05
	Moral Judgement				0.12*	0.12*
	Self-Efficacy				0.19**	0.19**
	Social Support				0.00	0.00
Expo. level						
	SE-Knowledge					−0.04
	SE–Experience					0.00
	ΔR^2	**0.01***	**0.17****	**0.05****	**0.05****	**0.00**

PBC, Perceived Behavioral Control; SE, Social Entrepreneurship; ΔR^2, Difference in the amount of variance explained compared to the previous model (corrected R^2_{Total} =0.26).
All displayed β-values are standardized coefficients.
$^{*}p < 0.05$; $^{**}p < 0.01$.

similar pattern for SE-intention. Though knowledge of and experience with SE (exposition level) are the most proximal antecedents linked to SE-intention, their contribution to predicting SE-intention might be encapsulated in mediating variables on cognitive level 1. In addition, SE is still a relatively new phenomenon and more specific measures are needed to assess both SE-knowledge and SE-experience before final conclusions on their relative importance can be derived, especially cultural effects are expected (Zapkau et al., 2017).

Fields for further research in SE-intention—A research agenda

In light of our newly proposed multi-level framework for antecedents of SE-intention, we take the view that it may serve as a solid scientific underpinning for future research in the field. The following research streams seem particularly promising:

A. Identification and investigation of SE-intention formation mechanisms

In line with our framework, we found that adding cognitive antecedents to personality-driven ones leads to a more accurate prediction of SE-intention. The distinct mechanisms underlying this finding have only rarely been investigated. However, first evidence suggests that both the personality-driven and cognitive antecedents separately and directly affect SE-intention and, even more interestingly, personality-driven antecedents affect SE-intention *via* cognitive ones (Kruse et al., 2019; Chipeta et al., 2022). Given that our multi-level framework identifies more than just personality-driven and cognitive levels, it becomes obvious that the relation between diverse antecedents is still ill understood. Nevertheless, in line with our results it can be assumed that there are overlaps as well as interdependencies among the various antecedents on the same level and across different levels. Consequently, we consider a thorough investigation of the following questions as essential to further understand the complex interplay between SE-intention antecedents:

1. How do the various antecedents on the same conceptual level relate to each other? What does their internal structure look like? Is the cognitive antecedent "Attitudes Toward Se" an independent predictor of se-intention or is it rather a mediator which triggers other cognitive antecedents on the same level?
2. Do distal antecedents on the personality level indirectly affect SE-intention *via* more proximal antecedents on the first and second cognitive level?

Furthermore, we consider our framework an open framework that allows to add a wide variety of constructs on each level, for instance, the Big Five Personality Traits (Nga and Shamuganathan, 2010). Thus, we explicitly encourage scholars to contribute to the empirically validated extension of our multi-level framework. Ultimately, this will help to get a thorough understanding of the SE-intention formation process.

B. Cultural embeddedness of SE-intention antecedents

The vast majority of samples investigating SE-intention stems from so called *WEIRD*-countries which are *w*estern, *e*ducated, *i*ndustrial, *r*ich, and *d*emocratic (Henrich et al., 2010). This holds true even though the biggest need for and activity in SE is found in developing countries (Ebrashi and Darrag, 2017; Najafizada and Cohen, 2017). Based on the circumstance that cultural differences between *WEIRD* and developing countries exist and that they affect SE-intention (Kedmenec and Strašek, 2017), we encourage scholars to pay more attention to a country's culture when studying SE-intention. Consequently, the following question should be addressed:

3. Can our proposed multi-level framework with its innate assumptions be applied in different cultures, i.e., Is it cross-culturally solid?

Even though our investigation is a first step toward a more culturally diverse investigation of the antecedents for SE-intention as it uses an African sample, more work is needed to gain a better understanding of the cultural dependence across antecedents and their impact. To gain such understanding we suggest conducting studies with samples from multiple countries and cultures (Gupta et al., 2020; Kruse, 2021).

C. Contextualizing individual-level processes in SE-intention formation

In addition to our person-based perspective on SE-intention antecedents, Institutional Theory suggests that also contextual circumstances like economy and society influence (entrepreneurial) decision making processes (Scott, 1995; Kibler et al., 2014; Kruse et al., 2021). Regarding economy, Amit and Muller (1995) distinguish between so called push entrepreneurs—entrepreneurs rather forced into their career due to a lack of alternatives—and pull entrepreneurs—entrepreneurs attracted by entrepreneurship due to its benefits. Considering the innate motivational differences comparing these two types of entrepreneurial action, the following question emerges:

4. Are different antecedents of se-intention differently important in various economic situations? For instance, are antecedents on the personality level more relevant for internally motivated pull entrepreneurs while antecedents on the cognitive level are more important for externally driven push entrepreneurs?

Regarding society, it is commonly acknowledged that the context individuals grows up in impacts the attractiveness of entrepreneurial careers (Zellweger et al., 2011; Palmer et al., 2021). Considering recent findings by Brunel et al. (2017) and Kruse (2020b) who examined the effect of role models on entrepreneurial intention, a particularly complex interplay between personality, cognitive, and social antecedents of SE-intention was found. However, the effect of social influences like a parental (social) entrepreneurship background has hardly been studied so far. Thus, the following question should be addressed:

5. To which extent does the social context (e.g., parents and role models) influence the person-based antecedents of se-intention proposed in our framework?

In addition to culture, economic drivers, and social background, the intention to found a social enterprise is impacted by gender and biological sex (Chipeta et al., 2020). Therefore, research within our multi-level framework of SE-intention antecedents should address the following question:

6. Does gender or sex impact the interaction between antecedents of different levels, for instance through gender self-concepts?

Limitations

As with any study there are limitations to consider. First, applying a convenience sampling technique, our results are neither representative for South Africa nor for other developing countries. Furthermore, despite controlling for ethnicity in our analyses we did not explicitly account for the wide variety of different ethnicities in South Africa and their individual cultural characteristics (Rivera-Santos et al., 2015). Thus, future studies should consider individual measures of culture such as the scale proposed by Yoo et al. (2011) that assesses Hofstede's (1984) cultural dimensions on an individual level.

Second, despite the VIF not exceeding the threshold of 4.00 indicating that no notable multicollinearity problems emerged in our analysis, recent findings by Vatcheva et al. (2016) suggest that even medium-size inter-predictor correlations about 30 can cause multicollinearity-related biases undetected by the VIF. Thus, we limited our analyses to the proposed levels only and did not take the single variable effects into account.

Third, future studies might want to extend the research scope to SE-behaviors and thus offer a more comprehensive investigation on the question what affects the *actual creation* of a social enterprise. In that regard, longitudinal studies are certainly needed to close the intention-behavior-gap (Kautonen et al., 2015) and to directly link antecedents of SE-intention to observable SE-behavior (Meoli et al., 2020).

Conclusion

This paper proposes a new multi-level framework to structure person-based antecedents of the intention to become a social entrepreneur. Based on the relative proximity to SE-intention, we identified four levels on which antecedents can be anchored: One personality level, two cognitive levels, and one exposition level. While the personality level refers to socio-emotional traits relevant for a wider variety of jobs including but not limited to entrepreneurial contexts, the cognitive level entails a person's effort to evaluate the entrepreneurial process and the exposition level includes SE-specific knowledge and experience. Empirical examination of the multi-level framework using a large South African sample provides initial support for its basic assumptions and shows that the antecedents from different levels largely complement each other. Importantly, we consider our framework an open framework that enables an empirically validated extension by adding a variety of constructs at each level, which ultimately should enable a thorough understanding of the SE-intention formation process. Finally, our findings suggest three central streams of future research which seem particularly fruitful to disentangle the twisted net of SE-intention antecedents: (1) the identification and investigation of SE-intention formation mechanisms, (2) the cultural embeddedness of antecedents, and (3) the contextualization of individual-level processes in SE-intention formation.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The current study involved human participants and was reviewed and approved at Technical University of Dresden, Germany. The participants provided their written informed consent to participate in this study. Participation was voluntary.

Author contributions

SB, PK, and CP contributed to the conceptual idea, data analyses and write up. MD contributed to the data management. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Curious enough to start up? How epistemic curiosity and entrepreneurial alertness influence entrepreneurship orientation and intention

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Epistemic curiosity as the desire to acquire new knowledge and ideas is considered as an important attribute for successful entrepreneurs among practitioners, yet there is lacking empirical evidence of epistemic curiosity having an effect on entrepreneurial outcomes. This study aims to put a spotlight on epistemic curiosity as a predictor for entrepreneurial intentions and orientation. We found that epistemic curiosity has a stronger influence on entrepreneurial outcomes in comparison to the Big Five personality *trait openness to experience*, which is a widely used and conceptually related predictor for entrepreneurship. Furthermore, we found evidence for a mediating role of entrepreneurial alertness which gives further insights about how personality influences the ability to recognize business opportunities and leads to the formation of entrepreneurship orientation and intentions. Our findings contribute to the field of entrepreneurship research by emphasizing that epistemic curiosity may be one of the most important personality indicators for the emergence of entrepreneurial intentions and behavior.

KEYWORDS

entrepreneurship, epistemic curiosity, entrepreneurial intentions, entrepreneurial alertness, openness to experience

Introduction

Curiosity is the desire to gain new experiences and knowledge; it motivates people to learn and try something new and is a driving force for human behavior throughout many domains and stages of life (Berlyne, 1954; Loewenstein, 1994; Mussel et al., 2012; Gino, 2018; Lindholm, 2018; Litman, 2019). Interest in researching curiosity has risen in the past years across multiple fields. Thus, a Web of Science search showed that the number of citations and publications addressing curiosity has almost tripled between 2016 and 2021, with 333 publications in 2021 alone (see Figure 1). In fact, research on curiosity has found that curiosity has many positive effects on our lives, ranging from improved interpersonal

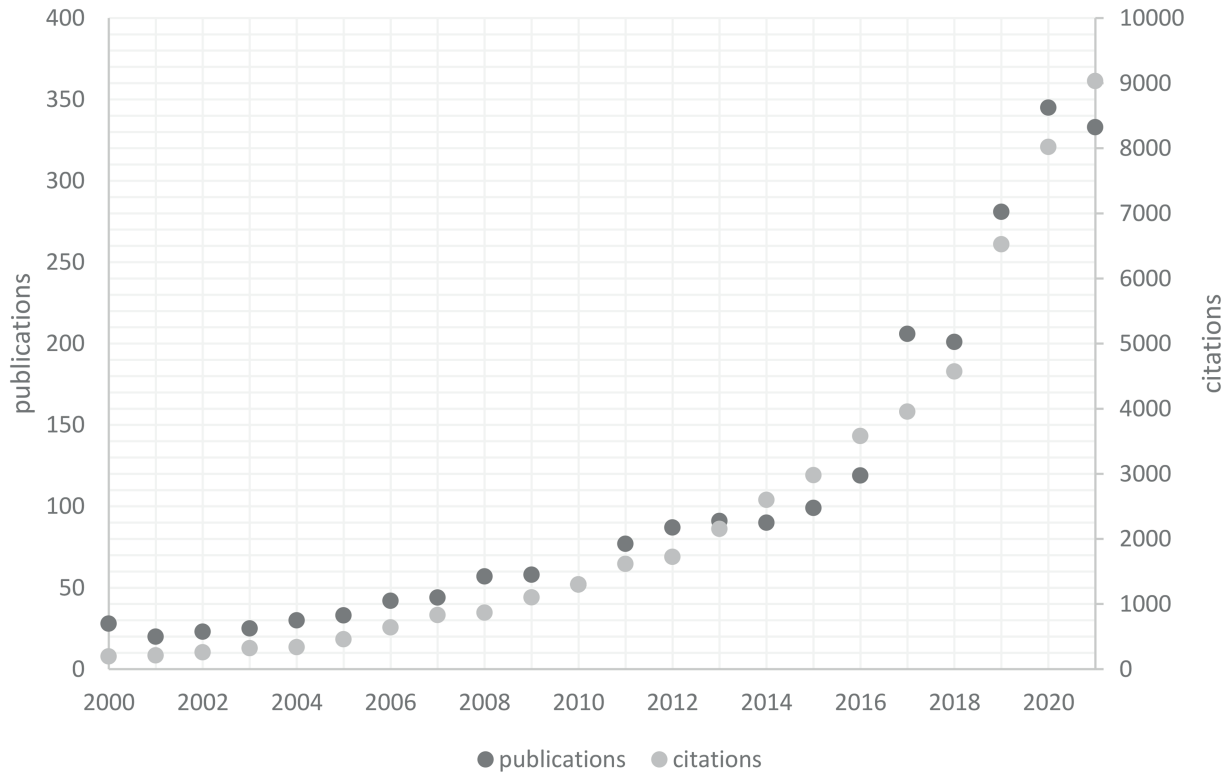

FIGURE 1
Publications and citations on Curiosity in psychology and management research from 2000 to 2021. This figure was created based on a Web of Science search for "curiosity" (25/08/2022).

relationships (Kashdan and Roberts, 2004) to social strengths (Kawamoto et al., 2017) and academic achievement (von Stumm et al., 2011). Furthermore, curiosity has long been prized in the occupational context, with many employers labeling themselves as curious, encouraging employees to be curious, and even hiring for curiosity (Mussel, 2013b). In the organizational context, curiosity has proven to be a valuable attribute for multiple work-related outcomes, including job performance, leadership, and creative performance (Harvey et al., 2009; Chang and Shih, 2019; Wagstaff et al., 2021).

Hence, curiosity seems to be a desirable attribute for finding a job in an existing organization, but does it also make someone want to start their own business? Many motivational blog entries and popular science articles point to the outstanding importance of curiosity for successfully founding a business (Goldin, 2018; Hamilton, 2019; Austin, 2020). These often highlight the dimension of curiosity that motivates people to tirelessly engage in learning new knowledge and ideas, which is conceptualized as epistemic curiosity (Berlyne, 1954). Some researchers even label it one of the "keys to entrepreneurial success" (Raine and Pandya, 2019, p. 189). In fact, researchers seem to agree that curiosity sparks innovation and creativity and influences productivity and job performance (Barron and Harrington, 1981; Reio and Wiswell, 2000; Gino, 2018). Surprisingly though, despite the apparent consensus about curiosity being one of the key attributes common to entrepreneurs, empirical evidence, and theoretical foundations about the role of curiosity in the emergence of entrepreneurship are still lacking.

We aim to contribute to entrepreneurial research by further investigating the importance of personality traits, specifically epistemic curiosity, for the emergence of entrepreneurial behavior. We contribute to the further understanding of the processes underlying the entrepreneurial personality by examining a mediational relationship between curiosity, entrepreneurial alertness, and entrepreneurial behaviors. We aim to strengthen the position of curiosity as one of the drivers of entrepreneurship tendencies, by comparing it to openness to experience as a trait strongly connected to entrepreneurial intention (Zhao and Seibert, 2006; Antoncic et al., 2015; Chan et al., 2015; Şahin et al., 2019).

Throughout this article, we will first describe the concept of epistemic curiosity and the contexts for which it is a relevant trait. In the following, we will describe the relevance of epistemic curiosity for the entrepreneurship context and compare it to openness to experience as a familiar concept which is used extensively to describe the entrepreneurial personality. Then, we will briefly describe the concept of entrepreneurial alertness and its relationship to epistemic curiosity, as we propose that curiosity is an antecedent of entrepreneurial alertness. Materials and methods are described, before we report the results from our analyses. In the last

section of this article, implications for entrepreneurship researchers and practitioners are discussed.

Literature review and hypotheses development

Epistemic curiosity

As curiosity can be observed in many different contexts, Berlyne (1954) differentiated between a perceptual and an epistemic dimension of curiosity. Perceptual curiosity refers to the sensation of visual, auditory, and tactile stimuli, while epistemic curiosity is defined as a desire for new information that motivates one to engage in learning and exploratory behavior (Litman and Spielberger, 2003). The epistemic form of curiosity is closely related to measures of intellectual achievement and is conceptually close to familiar constructs like need for cognition and openness to ideas (Mussel, 2010). Curiosity is directly contributing to knowledge acquisition, which positively influences performance in the workplace and other contexts (Jeong and Lee, 2019; Lievens et al., 2022).

Curious behavior can be driven either by positive interest, aiming at pleasurable feelings of discovering something new, or deprivation, occurring as a response to an uncomfortable state of not-knowing (Litman, 2008). The interest (I-type) and deprivation (D-type) dimensions reflect that curiosity can be associated with both positive and negative affect, depending on whether the individual is motivated by positive anticipation or by being unsatisfied with an existing knowledge gap (Litman, 2008). Moreover, epistemic curiosity can be differentiated into specific and diverse curiosity, depending on the range of topics that are affected by an individual's curious behavior (Mussel et al., 2012). While diverse curiosity refers to general exploration, specific curiosity is shown when people engage in trying to solve a "particular puzzle" (Hagtvedt et al., 2019, p. 1).

In general though, there seems to be a single factor underlying epistemic curiosity, which is why we conceptualize epistemic curiosity as a unitary construct in the present study (Mussel et al., 2012). Curiosity in its epistemic form has been found useful in various applied contexts and is positively related to creative performance (Hardy et al., 2017), academic learning (Litman, 2008), and work-related measures, such as job performance (Mussel, 2013b).

Curiosity and the entrepreneurial context

What motivates people to create their own business has been a core research topic for entrepreneurship scholars in the past years (e.g., Fayolle and Liñán, 2014; Shane and Nicolaou, 2015; Fuller et al., 2018; Murnieks et al., 2020; Douglas et al., 2021). Researchers have put a lot of effort in examining which attributes and characteristics of a person are crucial for becoming a (successful) entrepreneur. They found a wide array of attributes influencing entrepreneurial behavior, ranging from personal values (e.g., Hueso et al., 2021), self-efficacy (e.g., Wilson et al., 2007), or environmental orientation (e.g., Barba-Sanchez et al., 2022), to a number of broad or specific personality traits (e.g., Zhao H. et al., 2010).

Despite the well-established use of curiosity as a predictor in other domains, its use in entrepreneurship research has been scarce. Merely one meta-analysis about the effects of career adaptability showed that curiosity can increase one's orientation toward entrepreneurship as a positive career adaptation result (Rudolph et al., 2017). Furthermore, Syed et al. (2020) found that curiosity moderated the relationship between entrepreneurial passion and intentions and Jeraj and Antoncic (2013) were working toward a concept of context-specific entrepreneurial curiosity. These results linking curiosity to entrepreneurial outcomes are promising, but the field is lacking a solid body of research, as ample evidence cannot be found. It needs to be established whether curiosity has a substantial effect on entrepreneurial outcomes and what the nature of this effect is.

The lack of research on curiosity's role in entrepreneurship is surprising, since being curious is highly relevant for entrepreneurs, given that entrepreneurship can be conceptualized as the identification and exploitation of business opportunities (Shane and Venkataraman, 2000). Before an opportunity can be exploited, it needs to be identified by the entrepreneur. Curiosity motivates people to ask questions, solve problems, and deal with complex theories, all of which could help them identify opportunities that have not yet been exploited by others (Litman and Spielberger, 2003).

Many great inventions and historical discoveries came about because an explorer or an inventor was curious about something and did not stop looking into it (Gino, 2018); the same attitude should help a person become a pioneer in a field of business and recognize a business opening before someone else does. Research on the recognition of entrepreneurial opportunities often focuses on the need to be alert to potential business opportunities, which enables individuals to discover or create a fit between market needs and available resources (Ardichvili et al., 2003). While this requires a certain amount of knowledge about market needs and resources, a more personality-based approach could introduce curiosity as an individual source of opportunity recognition, for multiple reasons. First, people who are driven by a desire to learn, explore, and fill knowledge gaps should be more likely to identify opportunities as a result of their exploratory behavior (Arikan et al., 2020). Curious people should also be more intrigued to act on those opportunities as they are generally driven by the desire to succeed in an environment of uncertainty (Litman and Jimerson, 2004). In this context, curiosity can work as "a catalyst for individual action," leading individuals to engage in unknown activities such as founding a business and also to enjoy doing so (Lievens et al., 2022, p. 19). This ability to adapt and thrive in unknown settings by proactively engaging in learning and exploratory behavior is probably one of the most important

benefits of curiosity for any new entrepreneur. Second, curiosity activates behaviors that could directly lead to entrepreneurial actions, such as identifying a promising business idea. In a business context, the pressing urge to fill an encountered knowledge gap will lead the curious to be highly invested in their market research, possibly leading them to recognize a problem or issue with an existing market supply. Problem identification can be considered an initial stage of founding a start-up and is, therefore, the first entrepreneurial behavior that curiosity has a direct impact on (Frese and Gielnik, 2014). Third, as an epistemically curious individual, an entrepreneur will be highly motivated to solve relevant intellectual problems and come up with creative solutions that might turn into a business opportunity (Barron and Harrington, 1981; Baggen et al., 2015). As a consequence, more curious people should be better at identifying business opportunities.

Curious individuals enjoy contexts of uncertainty and novelty more than others and are better equipped to cope in those unknown and complex situations (Mussel, 2013b). The interest dimension of curiosity is especially associated with optimistic self-regulatory strategies, perseverance, and accepting higher risks in connection with exploration (Lievens et al., 2022). For an entrepreneur, these might be critical skills, e.g., when it comes to creating a business plan, preparing a pitch, or "going the extra-mile." Because of these direct links between curious behavior and entrepreneurial behavior, a curious individual should be more likely to think about starting their own business.

We expect that curiosity influences people's orientation and attitudes toward entrepreneurial topics and that more curious people have higher entrepreneurial intentions, which we define as a person's intent to start their own business and be self-employed (Krueger, 1993). Thus, we propose that curiosity is related to entrepreneurial outcomes, especially in advance of recognizing business opportunities. According to Ajzen (1985), intention is one of the best predictors for behavior, which is why we assess entrepreneurial intention as a determinant of entrepreneurial behavior.

> *Hypothesis 1*: Epistemic curiosity is positively related to entrepreneurship outcomes (i.e., entrepreneurial intentions and individual entrepreneurial orientation).

Openness to experience and epistemic curiosity

While curiosity has been widely unrecognized by entrepreneurship research, broad personality domains like the Big Five personality factors have been at the center of many efforts to predict entrepreneurial outcomes (Zhao and Seibert, 2006; Zhao H. et al., 2010; Brandstätter, 2011; Frese and Gielnik, 2014; Antoncic et al., 2015). Along with *conscientiousness* and *neuroticism* (negatively correlated), *openness to experience* has shown a significant association with starting a new business (Frese and Gielnik, 2014). Nevertheless, there is reasonable concern that broad personality traits might not be optimal for predicting entrepreneurial outcomes (Postigo et al., 2021). Rauch and Frese (2007) argued that the predicting traits should be matched to entrepreneurial tasks and showed in a meta-analysis that narrow personality traits, like innovativeness, proactive personality, and risk propensity, were better predictors for entrepreneurship than broad personality dimensions (Leutner et al., 2014). According to the symmetry principle (Wittmann, 1988), the predictive validity of a construct suffers when it contains criterion-irrelevant components or the predictor has a different level of generality than the criterion (Schulze et al., 2021). As such, this means that broad personality domains (e.g., openness to experience or conscientiousness) are too far up in the hierarchical order of personality traits to effectively predict a relatively narrow criterion like entrepreneurship. Thus, one should refer to narrower traits in the hierarchy, like the specific Big Five sub-facets or other lower-order traits (Schulze et al., 2021). As an example, studies measuring conscientiousness include both the facets achievement motive and dependability. These two facets are specific traits, but only one of them (achievement motive) is strongly correlated with the criterion (business success), whereas the other (dependability) is not (Zhao and Seibert, 2006). As a result, the overall score for conscientiousness' correlation with business success is lower than for its facet achievement motive, which drew Rauch and Frese (2007) to conclude that the specific personality trait of achievement motive is a better predictor for entrepreneurship than conscientiousness. Even though complex measures are a comfortable choice, a growing research body argues that selecting specific measures for both sides of the prediction equation can improve the understanding of the relationship at hand (Tett et al., 2003).

Further, any construct used to predict entrepreneurial outcomes should directly "match personality with work characteristics" (Rauch and Frese, 2007, p. 358). Consequently, this means that in our study, predictors should not include components that are unmatched with entrepreneurial work characteristics; following a confirmatory research strategy by making sure all of our predicting traits are related to the tasks that occur for the work of an entrepreneur (Tett and Christiansen, 2007).

Analogous to the example for conscientiousness mentioned above, the factor openness to experience in its entirety seems too broad and heterogeneous for our purpose (Mussel et al., 2011), even though it is commonly used to predict entrepreneurial criteria like intentions or business creation (Zhao and Seibert, 2006; Awwad and Al-Aseer, 2021). As it also contains sub-facets that are irrelevant for entrepreneurial outcomes (e.g., openness to feelings and openness to esthetics; Mussel et al., 2011) we should reconsider whether openness to experience fits with the criterion of predicting entrepreneurial criteria. Considering this, epistemic curiosity offers a more specific personality trait from the openness to experience spectrum but that is free from irrelevant sub-facets. Searching for more specific personality traits in this context, the next step would be to examine the six sub-facets of this Big Five factor. While some of the sub-facets (e.g., openness to esthetics

and feelings) clearly seem to be irrelevant for entrepreneurship, others are a better match for entrepreneurial tasks. Next to adventurousness and liberalism, especially openness to ideas (also referred to as intellect; Goldberg et al., 2006) seems a good fit for this cause, as it drives intellectual exploration and coming up with new ideas (Mussel, 2013a).

Openness to experiences shows certain similarities with epistemic curiosity; in fact, it is hard to establish discriminant validity between the two concepts. Curiosity is a more agentic trait and explains behavior more directly (Harrison and Dossinger, 2017). In contrast, the openness to experience facets are passive traits and do not hold any motivational aspects (Harrison and Dossinger, 2017). On a sub-dimensional level, deprivation-type epistemic curiosity shows associations with conscientiousness, as it refers to the perseverant acquisition of knowledge rather than wide exploration and imagination (Litman and Mussel, 2013). Furthermore, in an attempt to establish construct validity for epistemic curiosity, Mussel (2013a) showed that work-related curiosity best predicts vocational interest in occupations from the entrepreneurial context.

In line with the demands issued by Rauch and Frese (2007)—that good predictors for entrepreneurship need to be narrow traits matched to entrepreneurial tasks—epistemic curiosity may present a predictor on the right level of the hierarchy of personality traits matched to entrepreneurial tasks and free from task-irrelevant sub-facets. Convergent validity with factors closely related to entrepreneurial outcomes (i.e., the conscientiousness facet achievement, creativity, and intellectual stimulation), strengthens the assumption of curiosity being relevant for entrepreneurship (Litman and Spielberger, 2003; Mussel, 2010; Hardy et al., 2017). Additionally, epistemic curiosity had incremental validity over openness to experience in predicting work-related criteria like job performance (Mussel, 2013b), which is why we hypothesize that curiosity will also show incremental validity in predicting various measures of entrepreneurship.

> *Hypothesis 2*: Epistemic curiosity predicts entrepreneurship (i.e., entrepreneurial intentions and individual entrepreneurial orientation) beyond the effect of openness to experience.

Entrepreneurial alertness

In past research, the successful recognition of business opportunities has often been explained using the concept of entrepreneurial alertness (Neneh, 2019; Sharma, 2019; Chavoushi et al., 2021; Tang et al., 2021; Lanivich et al., 2022). Entrepreneurial alertness is an individual's ability to identify business opportunities, which are not recognized by others (Kirzner, 1983). The concept aims to explain how entrepreneurs identify new opportunities to start a business, with the assumption that entrepreneurs are generally more alert to opportunities (Gaglio and Katz, 2001; Tang et al., 2012). Kirzner (1997) as the first one to use the term entrepreneurial alertness, argued that business opportunities are not necessarily *created* by particular entrepreneurs, in contrast they need to be *found* after they emerge due to suboptimal market processes that result in a market imbalance (Sharma, 2019). While alertness is widely accepted to be an antecedent for entrepreneurial behavior, there are different theories about the theoretical foundations, with some arguing for behavioral explanations (Kaish and Gilad, 1991) and others highlighting cognitive capacities, especially creativity and general mental ability (Gaglio and Katz, 2001; Baron and Ensley, 2006). In original conceptualization of Kirzner (1997), he laid great importance on the availability of information that leads to the recognition of profit opportunities. As some people had better access to information than others, it was easier for them to recognize opportunities without searching for them (see Sharma, 2019). However, the conceptualization of alertness has evolved in its definition since Kirzner, leading to multiple streams of research about the theoretical foundations of the concept, such as cognitive abilities, social networks, and personality traits, as Lanivich et al. (2022) point out in a systematic review on alertness (also see Sharma, 2019).

Epistemic curiosity and entrepreneurial alertness

Following a personality-based approach on entrepreneurial alertness, alertness, and the recognition of possible business opportunities might be influenced by the personality trait curiosity. As a "critical first step" of the entrepreneurial process, recognizing business opportunities might depend on an entrepreneur's exploratory and learning behavior (Ardichvili et al., 2003; Chavoushi et al., 2021, p.2). Being alert to new possibilities does not require possessing information but rather the ability and motivation to acquire new information, which should make learning and exploratory behavior important factors for alertness (Uy et al., 2015). People who can "think outside the box" and are proactively trying to acquire new information should be more alert to new possibilities and should, effectively, be more successful at identifying new business opportunities (Hu et al., 2018). We propose that epistemic curiosity contributes to individual differences in people's alertness to business opportunities, specifically that curious people are more entrepreneurially alert.

> *Hypothesis 3*: Epistemic curiosity is positively related to entrepreneurial alertness.

Drawing from an unclear state of research about the underlying foundations of individual alertness (Frese and Gielnik, 2014; Lee Lim et al., 2014; Lanivich et al., 2022), we propose that curiosity is not just an antecedent of alertness but is actually the driving force behind entrepreneurial alertness' effect on entrepreneurial outcomes. Curious behavior, like learning new skills, adapting to changing environments, trying to solve complex problems, or simply reading the news

TABLE 1 Descriptive sample characteristics.

	Entrepreneur ($N = 115$)	Non-Entrepreneur ($N = 181$)	Overall ($N = 296$)
Gender			
Female	71 (61.7%)	135 (74.6%)	206 (69.6%)
Male	35 (30.4%)	38 (21.0%)	73 (24.7%)
Other/ No answer	9 (7.9%)	8 (4.4%)	17 (5.7%)
Age			
Mean (SD)	39.0 (13.1)	26.1 (9.41)	31.1 (12.7)
Education			
Master's or higher	26 (22.6%)	9 (5.1%)	35 (11.1%)
Bachelor's	37 (32.2%)	52 (28.7%)	89 (30.1%)
Associate Degree	12 (10.4%)	13 (7.2%)	25 (8.4%)
Trade/technical/vocational training	6 (5.2%)	1 (0.6%)	7 (2.4%)
Some college credit, no degree	22 (19.1%)	55 (30.4%)	77 (26.0%)
(Some) High school	12 (10.5%)	51 (28.2%)	63 (21.3%)

$N = 296$. Participants were on average 31.1 years old ($SD = 12.7$), and participant age ranged from 18 to 74 years.

on a newly discovered topic, helps people to be aware of evolving opportunities and improves their entrepreneurial alertness. People who engage in learning and exploratory behavior and are motivated by the desire to fill knowledge gaps should score higher on both entrepreneurial alertness and entrepreneurship measures.

In this manner, we propose that the positive effect curiosity has on entrepreneurship is transmitted through entrepreneurial alertness. We formulate our theorizing on the conceptual link between curiosity and alertness as both refer to the active search for ideas and information that can lead to the discovery of business opportunities, with curiosity as a specific personality trait and alertness as a cognitive skill (Tang et al., 2012; Lievens et al., 2022). Various research has shown that entrepreneurial alertness substantially contributes to the formation of entrepreneurial intentions (McMullen and Shepherd, 2006; Hu et al., 2018). In turn, alertness itself is strongly connected to personality and is positively influenced by different underlying competencies (Obschonka et al., 2017). Assessing the relationship between personality and entrepreneurial intention, personality traits like creativity, boundaryless mindset, and proactivity affected intentions toward entrepreneurship *via* mediating processes involving entrepreneurial alertness (Lee Lim et al., 2014; Uy et al., 2015; Obschonka et al., 2017; Hu et al., 2018). Thus, we argue that curiosity manifests itself onto recognizing business opportunities, for which alertness is a crucial skill and we propose a mediational model, stating that curiosity leads to entrepreneurial alertness, which effectively leads to entrepreneurial behavior. Hence, we posit:

> *Hypothesis 4*: Entrepreneurial alertness mediates the relationship between epistemic curiosity and entrepreneurship (i.e., entrepreneurial intentions and individual entrepreneurial orientation).

Materials and methods

Sample

An *a priori* power analysis computed with g*power 3.1.9.7 resulted in a sample size of 295 participants required to test our hypotheses with a statistical power of $1-\beta = 0.95$, on a significance level of $\alpha = 0.05$ (Faul et al., 2009). Specifically, we assumed an effect of Cohen's $f^2 = 0.044$, responding to an assumed increase of $\Delta R^2 = 0.04$ in a hierarchical linear regression with three predictors. The assumed effect size corresponds to findings about the incremental validity of curiosity above openness to experience for the prediction of job performance (Mussel, 2013b).

Of 383 participants, 356 people finished the survey and were compensated for their participation with a monetary reward (7.05% drop-out rate). A total of 60 participants were excluded from the analyses due to peculiar responses to quality-monitoring items (for further details, see section careless responding).[1] The final sample consisted of 296 participants from 18 to 74 years old, residing in the United States (Table 1). The participants were 31.12 years old on average ($SD = 12.67$ years) and 69.59% were female. In this sample, 16 participants did not identify as male or female, and one participant chose the option "prefer not to answer." Most participants were in an employed working position at the time of the survey (58.45%). Of the total sample, 38.85% (115) reported that they had started a business in the past or were currently self-employed.

1 The results of our analyses did not substantially change when the 60 people were included in the analyses. Compensation did not depend on the answers to the quality-monitoring items.

TABLE 2 Technical specifications of the study.

Population	Entrepreneurs in the United States: 31 million (GEM (Global Entrepreneurship Monitor), 2022)
Sampling technique	Online panel prolific.co
	Screening criteria:
	US American citizen, first language English
	50%: self-described entrepreneur
Method of data collection	Online survey
Sample size	296
Dates of data collection	11/07/2021–26/07/2021
Pre-Registration	https://aspredicted.org/GMR_W5N
Data available	https://osf.io/95vbq/?view_only=48fe194b2deb441bb61c2be56b5485b7

Data collection was anonymous; no data were saved on the servers of prolific.co.

The majority of participants (50.34%) had a university degree (associate degree or higher), while 48.31% held a high school degree, and 1.35% did not finish high school.

Procedure

We designed an online survey using the experimental software platform Unipark (EFS Survey, Questback GmbH). We recruited a sample of American adults *via* the online research platform Prolific,[2,3] which offers a diverse participant population using crowdsourcing for behavioral research (Peer et al., 2017). We used screening functions of the platform to specifically reach entrepreneurs, which we defined as people who are currently running their own business or have done so in the past (Table 2). Before data collection started, the study design and hypotheses were pre-registered on aspredicted.org.[4] Participants were asked to complete a test battery consisting of multiple questionnaires to assess the variables depicted below. Participation was voluntary and anonymous, the participants had both the chance to cancel their participation at any time or self-exclude their data from further processing after finishing the study. The participants provided their written informed consent to participate in this study. The mean duration for completing the survey was 14 min, after completion they were automatically referred to the panel website.

Independent variables

The independent variables were measured by established scales that have been used previously in multiple studies (Heaven and Bucci, 2001; Lee-Ross, 2017; Hu et al., 2018) and have shown sufficient reliability and validity.

Epistemic curiosity

To assess epistemic curiosity, we used the English version of the Work-Related Curiosity Scale (WORCS; Mussel et al., 2012). The WORCS consists of 10 items, e.g., "I am interested in how my contribution impacts the company," that are rated on a Likert scale ranging from 1 (*does not apply at all*) to 7 (*fully applies*). This scale offers a work context-specific assessment, which we chose because our study focuses on the work-related impact that curiosity might have. The reliability of the scale was good, with $\alpha = 0.87$. As an alternative measure for epistemic curiosity, we used the two-dimensional 10-item I/D EC-Scale, which includes five items each to measure the interest-type and deprivation-type dimensions of epistemic curiosity on a context-unspecific level (Litman et al., 2010). This scale produces a more differentiated view on epistemic curiosity at the facet level, allowing us to explore whether the two dimensions impact entrepreneurship differently. Participants were asked to rate their feelings toward each item on a four-point Likert scale from 1 (*almost never*) to 4 (*almost always*; Litman et al., 2010). Reliabilities for the scales ranged from $\alpha = 0.85$ to $\alpha = 0.87$.

Openness to experience

To measure the personality trait openness to experience according to Costa and McCrae (2008), we used a 60-item scale from the International Personality Item Pool (IPIP; Goldberg et al., 2006) with 10 items for each of six facets, namely imagination, artistic interests, emotionality, adventurousness, intellect, and liberalism, measured on a five-point Likert scale. Sample items are "I have a vivid imagination" (imagination) and "I like to solve complex problems" (intellect). The facets are similar to those of the commonly used NEO-PI-R by Costa and McCrae (2008) but are labeled differently; for example, the intellect facet can be interpreted analogously to the openness to ideas facet from the NEO-PI-R. Reliability of the openness to experience scale was $\alpha = 0.91$. The highest internal consistency was found for the facet intellect ($\alpha = 0.86$); the facets with the lowest reliabilities were adventurousness and artistic interest ($\alpha = 0.80$).

2 www.prolific.co

3 Prolific and other online crowdsourcing platforms have shown to be reliable and valid tools for behavioral research that can successfully replicate experimental studies from laboratory settings (Crump et al., 2013; Palan and Schitter, 2018).

4 https://aspredicted.org/GMR_W5N

Entrepreneurial alertness

Entrepreneurial alertness was measured using the 13-item scale by Tang et al. (2012). Example items included "I have a gut feeling about potential opportunities" and "I always keep an eye out for new business ideas when looking for information," rated on seven-point Likert scales from 1 (*strongly disagree*) to 7 (*strongly agree*). The instrument contains three separate scales, namely (1) scanning and search, (2) association and connection, and (3) evaluation and judgment. Reliabilities (α) of the three scales ranged from 0.77 to 0.89.

Affinity for technology

Additionally, the battery included the Affinity for Technology Interaction scale to detect possible moderating effects (Franke et al., 2019). For this scale, we used a six-point Likert scale ranging from 1 (*completely disagree*) to 6 (*completely agree*) to rate the nine items (Franke et al., 2019). The reliability of the scale was good, with $\alpha = 0.87$.

Careless responding

Finally, we assessed careless responding to identify and exclude irregular responders. Meade and Craig (2012) recommended including bogus items which are used to detect careless responding (Anderson et al., 1984; Levashina et al., 2009): Participants were asked about their familiarity with made-up techniques (e.g., "I am trained at using Johnson's dyadic approach of avoiding conflict in work teams"; see Levashina et al., 2009). In addition, we inserted two instructed response items (e.g., "To monitor quality, please respond with a two for this item," see Meade and Craig, 2012). Participants were excluded if they failed to insert the correct response for more than one instructed response item or if they indicated to agree with at least one bogus item.

Dependent variables

Entrepreneurial outcomes were assessed using two separate variables from the entrepreneurial context that are central outcomes of entrepreneurship, namely entrepreneurial intentions and individual entrepreneurial orientation (Baron and Ensley, 2006; Zhao H. et al., 2010; Bolton and Lane, 2012).[5]

Entrepreneurial intentions

Entrepreneurial intentions were measured using the Entrepreneurial Intention Questionnaire (Liñán and Chen, 2009), which contains six items measured on a seven-point Likert scale. A sample item is "I am determined to create a company in the future." The reliability of the questionnaire was good, with $\alpha = 0.96$. As we also included entrepreneurs in the sample, we added the question "Have you ever started your own business?" to later explore differences between entrepreneurs and non-entrepreneurs. Participants were additionally asked to estimate the probability that they will start their own business in the next 5 years on a scale from 1 to 100 percent (Krueger et al., 2000). This was added as a purely exploratory assessment to gain a more direct estimation of how manifested the participant's thought of starting a business was when considering a fixed time frame.

Entrepreneurial orientation

As a second measure for entrepreneurship, we assessed participant's individual entrepreneurial orientation (IEO), using 10 items from Bolton and Lane (2012). The measure includes items for the dimensions risk taking, innovativeness, and proactive personality rated on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The reliability of the IEO scale was sufficient, with $\alpha = 0.81$.

Analysis strategy

Group differences between entrepreneurs and non-entrepreneurs were explored using a one-way MANOVA. We performed a linear regression analysis to identify the possible influence that epistemic curiosity has on entrepreneurial intentions and individual entrepreneurial orientation. Multiple regression analyses were used to examine the amount of variance in entrepreneurship that could be explained by epistemic curiosity compared to openness to experience in a model using both as predictors for each entrepreneurship outcome variable. Values for openness to experience were computed by taking the mean value over all openness facets of a participant. Analogously, the mean of all three alertness facets formed a person's entrepreneurial alertness score. All hypotheses were tested at factor level. Mediation analysis was used following recommendations by Zhao X. et al. (2010) to investigate a mediational relationship between epistemic curiosity, entrepreneurial alertness, and entrepreneurship. The indirect effect was tested for significance using a bias-corrected bootstrapping procedure (MacKinnon et al., 2004). Data and Supplementary materials are available at https://osf.io/95vbq/?view_only=48fe194b2deb441bb61c2be56b5485b7.

Results

Preliminary analyses

Before we tested our hypotheses, preliminary analyses were conducted to describe the data, explore group differences, consider the reliabilities of the scales, and check for common method variance. We tested group differences between entrepreneurs and non-entrepreneurs to explore whether they

5 Recognition of business opportunities was assessed as a third measure for entrepreneurial behavior. Results are available in Appendix A (see Electronic Supplementary material).

TABLE 3 One-way MANOVA results for group differences between entrepreneurs and non-entrepreneurs.

	Value	*F*	Hypotheses *df*	Error *df*	*p*
Pillai's trace	0.29	29.40	4	291	< 0.001
Wilk's lambda	0.71	29.40	4	291	< 0.001
Hotelling's trace	0.40	29.40	4	291	< 0.001

	Entrepreneurs ($n = 115$)		Non-Entrepreneurs ($n = 181$)			Hypotheses	Error	*p*
	M	*SD*	*M*	*SD*	*F*	*df*	*df*	
Predictors								
Epistemic Curiosity Openness to	5.72	0.88	5.32	0.94	13.54	1	294	< 0.001
Experience	3.93	0.42	3.87	0.38	1.69	1	294	0.195
Criteria								
Entrepreneurial Intention	5.06	1.55	2.96	1.67	118.07	1	294	< 0.001
Individual Entrepreneurial Orientation	3.79	0.65	3.44	0.62	21.24	1	294	< 0.001

M and *SD* are used to represent mean and standard deviation, respectively. *F* statistics and degrees of freedom are reported.

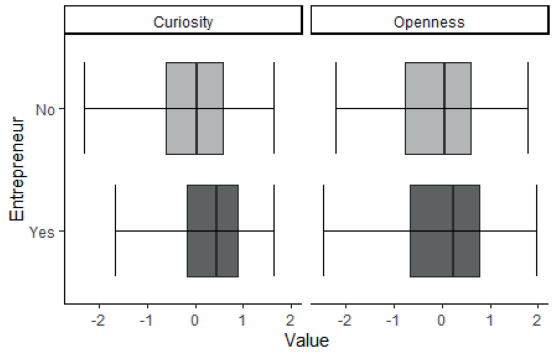

FIGURE 2
Values of curiosity and openness for entrepreneurs and non-entrepreneurs. Boxplots mark the median for each group and interquartile range for the standardized values of openness to experience and epistemic curiosity, respectively. Non-entrepreneurs in light gray, entrepreneurs in dark gray.

already differed in our dependent and independent variables before looking closer at the relationship between those variables.

We first explored whether entrepreneurs and non-entrepreneurs differed in curiosity and openness to experience, as finding differences for only one of the variables might already indicate a disparate importance for becoming an entrepreneur, before even running more fine-grained analyses when testing for the hypotheses. To test for group differences between entrepreneurs and non-entrepreneurs, we performed a one-way MANOVA with the main predictors and criteria for the upcoming hypotheses tests. Results of the MANOVA can be seen in Table 3, showing a significant multivariate effect of entrepreneurial status [Pillai's trace = 0.29; $F(2, 291) = 29.40$; $p < 0.001$]. Univariate comparisons found group differences for all entrepreneurial outcomes and epistemic curiosity, but not for openness to experience (see Table 3), the alpha level was Bonferroni-corrected (0.05/4 = 0.0125) as we tested for four separate dependent variables. These differences are illustrated in Figure 2, showing significant differences in epistemic curiosity values [$\eta_p^2 = 0.04$; $F(1, 294) = 13.54$; $p < 0.001$], whereas the groups showed similar median values for openness to experience [$\eta_p^2 < 0.01$; $F(1, 294) = 1.69$; $p = 0.195$]. Figure 2 shows that entrepreneurs reported higher levels of epistemic curiosity than non-entrepreneurs, yet no significant differences were found for openness to experience. Entrepreneurial intention correlated with both I-type ($r = 0.30$) and D-type epistemic curiosity ($r = 0.28$), yet the size of the correlations was not significantly different ($p = 0.75$; 95% KI$r_{I\text{-}type}$-$r_{D\text{-}type}$ = [−0.11;0.16]).

Participants who reported that they had already started their own business at some point rated the probability that they will start another one at 60%, on average.

Age and gender had an effect on entrepreneurial outcomes but not on epistemic curiosity. The level of education was not related to entrepreneurial outcomes.[6] Descriptive statistics, Pearson correlations, and reliabilities for the independent and dependent variables can be seen in Table 4 (reliabilities on the diagonal).

As for all studies using self-report data, it was necessary to check whether our data were biased by common method variance (CMV). If a method factor accounts for a major amount of variance in the variables, it can distort item validities and the covariation between latent variables (MacKenzie and Podsakoff, 2012). To check for CMV, we applied Harman's one-factor test to see whether a single factor accounted for much of the covariance in our variables in an exploratory factor analysis (Podsakoff et al., 2003). This method is commonly used for identifying potential common method bias (Fuller et al., 2016). Following recommendations by Podsakoff et al. (2003), all items were loaded into an exploratory factor analysis; the result showed that the proportion of variance explained by a single general factor was 41% (*RMSEA* = 0.164; 95%CI [0.143,0.187]), therefore not exceeding the critical 50% level. Even though the test does not control for method variance, it is unlikely that common method

6 Age was positively related to entrepreneurial outcomes. Men showed higher entrepreneurial intention and orientation than women. Results for the preliminary analyses are available in the Supplementary material.

TABLE 4 Means, standard deviations, and correlations.

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Openness to Experience	3.89	0.40									
2. Epistemic Curiosity	5.47	0.94	0.41**								
3. I-type Curiosity	3.15	0.64	0.59**	0.60**							
4. D-type Curiosity	2.37	0.71	0.18**	0.43**	0.34**						
5. E. Alertness	4.94	0.88	0.33**	0.57**	0.47**	0.43**					
6. Scan & Search	5.09	1.03	0.34**	0.56**	0.49**	0.35**	0.80**				
7. Association & Connection	5.17	1.13	0.37**	0.47**	0.45**	0.43**	0.81**	0.52**			
8. Evaluation & Judgment	4.56	1.16	0.10	0.33**	0.20**	0.25**	0.77**	0.42**	0.39**		
9. E. Intentions	3.78	1.92	0.15**	0.39**	0.30**	0.28**	0.49**	0.51**	0.37**	0.31**	
10. IEO	3.58	0.65	0.33**	0.50**	0.37**	0.39**	0.65**	0.54**	0.49**	0.52**	0.43**

M and *SD* are used to represent mean and standard deviation, respectively.
*indicates $p < 0.05$; **indicates $p < 0.01$.

bias is a contaminant in our study, as the test indicated the presence of two separate factors, and therefore did not detect problematic variance explained by a single factor. In a confirmatory factors analysis, the single-factor model did not show a good fit with the data (CFI = 0.538) in comparison to the proposed model ($\Delta \chi^2 = 1663.98$; $p < 0.001$).

Hypotheses testing

Hypothesis 1 proposed that epistemic curiosity is positively related to the entrepreneurial outcomes of entrepreneurial intention and individual entrepreneurial orientation. Hypothesis 1 was supported, as epistemic curiosity showed significant correlations with entrepreneurial intention ($r = 0.39$; $p < 0.01$) and individual entrepreneurial orientation ($r = 0.50$; $p < 0.01$). A linear regression resulted in a significant regression weight of 0.80 ($SE = 0.11$; $p < 0.017$) for curiosity predicting entrepreneurial intentions and individual entrepreneurial orientation ($\beta = 0.34$; $SE = 0.04$; $p < 0.017$). The α level was corrected to adjust for alpha cumulation (α/number of tests = 0.05/3 = 0.017), as we repeatedly tested for three[7] dependent variables addressing the same hypothesis (Cabin and Mitchell, 2000).

To test if epistemic curiosity predicts entrepreneurship outcomes beyond what is explained by openness to experience (Hypothesis 2), we conducted an ordinary least squares regression analysis comparing a model using openness to experience and epistemic curiosity as predictors for entrepreneurship to a model using just openness to experience as a predictor. Results for the regression analyses can be seen in Table 5. The requirements for linear regression were met, as the data showed a linear relationship between predictors and criteria, and multivariate normality could also be observed when plotting the data. Furthermore, we found multicollinearity not to be a problem in our analysis, as the variance inflation factor ($VIF = 1.20$) was below 10, which is considered uncritical according to common rules (O'Brien, 2007). The assumption of homoscedasticity could also be kept, as a studentized Breusch–Pagan test (Breusch and Pagan, 1979) showed a non-significant result ($p = 0.059$).

Adding epistemic curiosity to the model as a second predictor led to a 12.8% increase of variance explained in entrepreneurial intentions ($\Delta R^2 = 0.128$; $p < 0.01$). Table 5 also depicts the results for a regression using the same arrangement of predictors but using individual entrepreneurial orientation as the criterion. Epistemic curiosity accounted for an increase in R^2 of $\Delta R^2 = 0.16$ ($p < 0.01$) when added last to the regression, confirming Hypothesis 2.

Hypothesis 3 stated that epistemic curiosity is positively related to entrepreneurial alertness. Linear regression results supported this assumption and showed a positive influence of curiosity on alertness ($\beta = 0.57$; $p < 0.001$); regression results can be seen in Table 6. Thus, Hypothesis 3 was supported.

Next, we proposed a mediational model of entrepreneurial alertness mediating the relationship between curiosity and entrepreneurship (Hypothesis 4). Figure 3 shows the mediational model, in which the total and direct effects of curiosity and alertness on entrepreneurial intentions and individual entrepreneurial orientation are illustrated. The established mediation can be classified as a complementary mediation, as both a direct and an indirect effect exists, both of which positively influence entrepreneurial intention (Zhao X. et al., 2010). Still, entrepreneurial alertness only partly mediates the relationship, as the direct effect of epistemic curiosity was not reduced to zero when controlling for the mediator (Baron and Kenny, 1986). To

7 We also assessed the number of business opportunities identified in the past 5years as a third measure of entrepreneurial performance. To improve readability, the results of the opportunity determination are not provided. Due to its ordinal-scale nature, ordinal logistic regression analyses were performed. Notably, results are in line with the other two dependent variables, confirming all hypotheses. More details about these analyses can be requested from the first author of this study and can be found in the Supplementary material.

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TABLE 5 Regression results for Hypothesis 2.

Predictor	Entrepreneurial intention					Individual entrepreneurial orientation				
	beta	*beta* 95% CI [LL, UL]	*r*	Fit R^2	Difference ΔR^2	*beta*	*beta* 95% CI [LL, UL]	*r*	Fit R^2	Difference ΔR^2
Model 1										
Openness to Experience	0.15**	[0.04, 0.27]	0.15**			0.33**	[0.22, 0.43]	0.33**		
				0.023**					0.106**	
				95% CI					95% CI	
				[0.00,0.07]					[0.05,0.17]	
Model 2										
Openness to Experience	−0.01	[−0.12, 0.11]	0.15**			0.15**	[0.04, 0.25]	0.33**		
Epistemic Curiosity	0.39**	[0.28, 0.51]	0.39**			0.44**	[0.33, 0.54]	0.50**		
				0.152**	0.128**				0.263**	0.158**
				95% CI	95% CI				95% CI	95% CI
				[0.08,0.22]	[0.06, 0.20]				[0.18,0.34]	[0.09, 0.23]

Beta indicates the standardized regression weights. *r* represents the zero-order correlation. LL and UL indicate the lower and upper limits of a confidence interval, respectively. ΔR^2 represents the difference between coefficients of determination of model 1 and 2.
**indicates $p < 0.01$.

TABLE 6 Regression results using entrepreneurial alertness as the criterion.

Predictor	*b*	*beta*	*beta* 95% CI [LL, UL]	*r*	Fit
(Intercept)	2.02**				
Epistemic Curiosity	0.53**	0.57	[0.48, 0.66]	0.57**	
					$R^2 = 0.324$**
					95%CI
					[0.24,0.40]

A significant b weight indicates the beta weight is also significant. *b* represents unstandardized regression weights. Beta indicates the standardized regression weights. *r* represents the zero-order correlation.
**indicates $p < 0.01$.

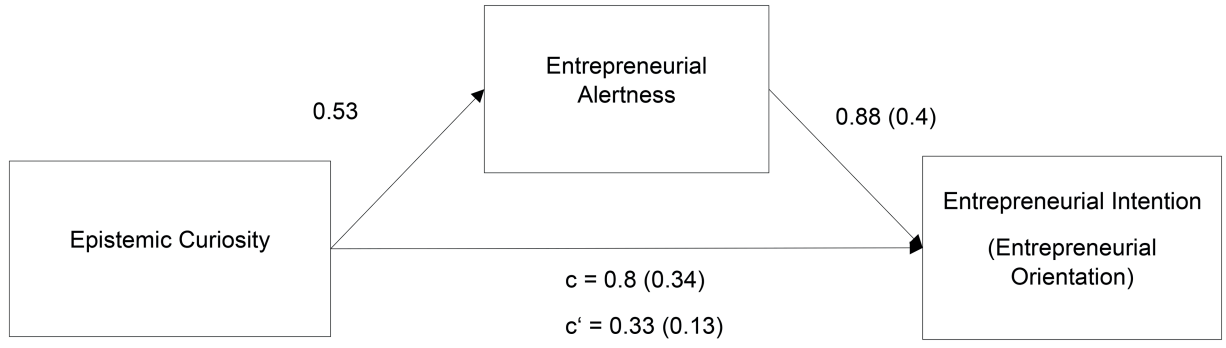

FIGURE 3
Mediational model for the prediction of entrepreneurial intention and orientation. Coefficients written on the paths are direct effects. "c" is the effect of epistemic curiosity on the criterion with the effect of alertness included. Values in brackets are direct effects on the criterion entrepreneurial orientation, analogously.

TABLE 7 Results for mediation analysis from epistemic curiosity to entrepreneurial alertness to entrepreneurial intentions.

Variables	Estimate	*SE*	*t*	*df*	*p*
Epistemic Curiosity → Entrepreneurial Intentions					
Direct effect	0.33**	0.13	2.64	293	< 0.01
Total effect	0.8**	0.11	7.25	294	< 0.01
Variables	**Estimate**	**Boot SE**	**Boot LLCI**	**Boot ULCI**	***p***
Epistemic Curiosity → Entrepreneurial Alertness → Entrepreneurial Intentions Indirect effect	0.47**	0.09	0.31	0.66	< 0.01

$N = 296$. Confidence intervals are set at 95% from the bootstrap analysis with 10,000 bootstrap resamples. SE, standard error; LLCI, lower level of confidence interval; and ULCI, upper level of confidence interval.
**indicates $p < 0.01$.

illustrate the intermediary effect, a bootstrapping procedure with 10,000 iterations was performed to test for significance of the indirect effect. The results can be seen in Table 7. The indirect effect is 0.47 for curiosity on entrepreneurial intention, with a 95% bootstrap CI of 0.31 and 0.66. The total and direct effects of the mediational model can be seen in Figure 3. The same steps were also performed on a model using individual entrepreneurial orientation as the criterion; here, a significant mediation effect was also found when individual entrepreneurial orientation was used as the entrepreneurship criterion. For this bootstrapping regression, which was performed with the same number of iterations, the indirect effect was 0.22 ($p < 0.01$; 95% CI[0.15, 0.29]). Thus, Hypothesis 4 was also supported.

Additional analyses

In addition to the analyses required for testing the hypotheses, we ran additional analyses with the six sub-facets of openness to experience in comparison to epistemic curiosity's effect on entrepreneurial outcomes. We examined a reversed mediational model using curiosity as the mediator to evaluate the fit of our proposed mediational model. Furthermore, we ran exploratory analyses using participants' technology affinity as a possible moderator.

Openness to experience sub-facets

In a multiple regression analysis using all openness to experiences sub-facets as predictors for entrepreneurial intention, only intellect ($\beta = 0.66$; $p < 0.001$) and adventurousness ($\beta = 0.60$; $p < 0.01$) showed significant positive regression weights. Analogously, intellect ($\beta = 0.32$; $p < 0.001$) and adventurousness ($\beta = 0.31$; $p < 0.001$) were the only significant positive regression weights predicting entrepreneurial orientation. Next, we tested whether curiosity significantly increased the proportion of explained variance over these two sub-facets in the prediction of entrepreneurial outcomes. In a linear regression, intellect explained 8.2% of the variance in entrepreneurial intention, yet the amount of variance explained almost doubled when epistemic curiosity was added as a second predictor ($\Delta R^2 = 0.078$; $p < 0.01$). Similar results were found for the analogous regression analysis performed with individual entrepreneurial orientation as the criterion.

The adventurousness sub-facet also accounted for a significant part of the variance in participants' entrepreneurial intentions ($R^2 = 0.053$; $p < 0.01$) but less so than intellect. When epistemic curiosity was added to the model, it again greatly increased the amount of variance explained ($\Delta R^2 = 0.110$; $p < 0.01$). Similarly, adventurousness also contributed to the determination coefficient in entrepreneurial orientation ($R^2 = 0.177$; $p < 0.01$), whereas epistemic curiosity to this model added another 10% in explained variance ($\Delta R^2 = 0.101$; $p < 0.01$).

Reversed mediation model

To evaluate the fit of our proposed mediational model, we compared it to a mediational model exchanging the mediator and the predictor. When using epistemic curiosity as a mediator for the relationship between alertness and entrepreneurial intention, no significant indirect effect was detectable using a Sobel Test ($p = 0.214$). This indicates that the order of effects that are proposed in our mediational model according to our theorizing are reasonable, as the order of the independent and moderating variables was not trivial.

Affinity for technology

For exploratory purposes, we investigated whether the direction or strength of curiosity's effect on entrepreneurship depended on participants' expression of an affinity for interacting with technology. An increasing percentage of newly founded start-ups have a digital and highly technologized character (Wu and Atkinson, 2017). Thus, because technology is important for the start-up sector, we were interested in whether our data showed an interplay between a participant's affinity for technology and curiosity. For example, people highly engaged in technology might either refrain from starting a business, as they are aware of the strength of the market competition in the technology sector, or they might be even more inclined to start their own tech business given their strong technological knowledge.

After performing a moderated regression analysis for this purpose, the data did not significantly show that technology affinity had a moderating effect on the relationship between

TABLE 8 Moderated regression results using entrepreneurial intentions as the criterion.

Predictor	*b*	*SE*	*t*	*p*	95% CI [LL, UL]	Fit
(Intercept)	3.75**	0.11	35.17	< 0.01	[3.54, 3.96]	
Epistemic Curiosity	0.70**	0.12	5.96	< 0.01	[0.47, 0.93]	
ATI	0.35**	0.11	3.10	< 0.01	[0.13, 0.57]	
Epistemic Curiosity × ATI	0.10	0.11	0.87	0.39	[−0.12, 0.32]	
						$R^2 = 0.182$**
						95% CI[0.10,0.25]

ATI indicates affinity for technology index. *b* represents unstandardized regression weights. SE, standard error; LL and UL indicate the lower and upper limits of a confidence interval, respectively.
**indicates $p < 0.01$.

curiosity and entrepreneurial intention ($\beta = 0.10$; $p = 0.385$) or entrepreneurial orientation ($\beta = 0.04$; $p = 0.236$). Apart from that, affinity for technology itself was positively associated with entrepreneurial intention ($\beta = 0.35$; $p < 0.1$) and orientation ($\beta = 0.10$; $p < 0.5$). The results from the moderated regression analysis are depicted in Table 8.

Discussion

With the present study, we intended to contribute to entrepreneurship research by emphasizing the importance of curiosity for the emergence of entrepreneurial intention and orientation. We found that curiosity is of particular importance for recognizing business opportunities, which is an important step in the entrepreneurial journey (Chavoushi et al., 2021). To outline curiosity's importance in this process, we proposed that entrepreneurial alertness is positively influenced by curiosity and impacts entrepreneurial outcomes. Specifically, we found evidence of alertness mediating the positive relationship between curiosity and entrepreneurial intention and orientation.

Even though openness to experience is often used to predict entrepreneurial tendencies, we only found weak correlations between this factor and entrepreneurial outcomes; the effect sizes were in line with meta-analytic results (Zhao and Seibert, 2006). We proposed epistemic curiosity as a conceptually better-suited predictor for entrepreneurship. Our data showed that epistemic curiosity predicts entrepreneurship above the effect of openness to experience. This indicates that curiosity can explain parts of variance in entrepreneurial outcomes that exceed what can be explained by openness to experience.

Furthermore, we proposed a mediational model, which was supported by the data, showing that entrepreneurial alertness mediates the relationship between curiosity and entrepreneurship. In contrast to prior result that found the effect of creativity and proactive personality on entrepreneurship to be completely mediated by alertness (Hu et al., 2018); the effect of curiosity was only partly mediated. This means that curiosity has an impact on entrepreneurship apart from what is transported *via* alertness, indicating that there are more mechanisms and processes affected by curiosity that lead to entrepreneurship; these need to be further investigated. The present results contribute to entrepreneurship research by strengthening the claims about the importance and nature of curiosity's role for the emergence of individual entrepreneurship (Harrison and Dossinger, 2017; Rudolph et al., 2017; Syed et al., 2020; Lievens et al., 2022).

Theoretical implications

The size of the effects observed in the regression analyses show that curiosity is not only related to entrepreneurship but seems to be among the strongest predictors for an individual's tendency to start a business. In the magnitude of the correlations that were found, curiosity even exceeded the effects of self-efficacy, autonomy, and risk propensity, which were the strongest predictors of entrepreneurial outcomes in meta-analytic examinations (Rauch and Frese, 2007; Zhao H. et al., 2010). Putting these results into perspective, our study delivers first and initial evidence for considering epistemic curiosity as one of the most important traits of the entrepreneurial personality.

Analyzing group differences between entrepreneurs and non-entrepreneurs, a noteworthy finding of this study is that they significantly differed in their expression of curiosity, yet no significant differences were found for openness to experience. This yields important theoretical contributions, since we found openness to predict the intentions and orientation toward starting a business, yet actually running a business seemed less related to openness to experience. There is a considerable gap between intention and behavior in the entrepreneurial context (Harima et al., 2021). It might be an interesting avenue for future research to determine if actions are more likely to follow entrepreneurial intentions if the person is more curious. Curiosity as an action-oriented trait could moderate the intention-behavior relationship, as the missing link that Kautonen et al. (2015, p. 670) described as "any personality attribute that refers to a preference for doing versus thinking, for example a preference for learning by doing and experimenting."

Finding differences in the values of openness and epistemic curiosity between entrepreneurs and non-entrepreneurs also points toward further evidence that curiosity and familiar constructs can be clearly distinguished. The present study shows that curiosity explains parts of variance in entrepreneurial outcomes that exceed what can be explained by openness to experience. As a consequence, the critical behaviors that lead to the formation of entrepreneurial intentions do not seem to be a result of the underlying mechanisms that curiosity and openness share but especially of those in which they differ. In contrast to openness to experience and its facets, curiosity is more active, agentic, and motivating (Harrison and Dossinger, 2017). Especially curiosity as a feeling of deprivation drives individuals to invest high levels of energy to acquire new information (Lievens et al., 2022). This initiative and active orientation toward new information in an uncertain environment seems to be necessary to make the decision to become an entrepreneur. In contrast, being passively *open* to the idea of founding a business might not be sufficient to form entrepreneurial tendencies or recognize business opportunities, as the results of this study suggest. The differences between the constructs are visible in the results as, epistemic curiosity showed incremental validity not only above the effect of openness to experience but also above the sub-facets of the Big Five factor.

Despite conceptual differences between interest-and deprivation-type curiosity, both were equally important for the entrepreneurial outcomes, as their effects were not significantly different. They impacted the outcomes equally, yet they may influence entrepreneurship from different approaches, thus fostering different behavioral expressions (Litman, 2008; Lievens et al., 2022); such expressions could not be observed in this study, as we only assessed the outcomes and not the actions preceding them.

The mediation of curiosity's effect on entrepreneurship *via* alertness implies that certain behaviors are activated by curiosity, whereby a curious mind leads to entrepreneurial behavior that has not yet been identified. The strong role of entrepreneurial alertness hints that this gap might be filled by actions that allow an individual to recognize entrepreneurial opportunities. Actively approaching new information in the context of exploration seems likely to be the key quality that empowers curious individuals to engage in entrepreneurial activities.

We contribute to entrepreneurial alertness research, as we provide further evidence that entrepreneurial alertness works as a strong predictor for entrepreneurship, building on prior theory that personality traits like creativity and proactivity influence a prospective entrepreneurs ability to recognize opportunities, which in turn leads to higher entrepreneurial intentions (Lee Lim et al., 2014; Uy et al., 2015). It seems that a commonality of many different predictors for entrepreneurship is that their influence is at least partly transported *via* one construct. This yields the following question: What explains this special position that entrepreneurial alertness seems to hold? Some argue that the concept of alertness itself is problematic, as it does not have an *a priori* meaning; alertness can only be observed once a person has actually identified an opportunity (McMullen and Shepherd, 2006). Therefore, critics argue that entrepreneurial alertness cannot be used as a "universal attribute of entrepreneurial individuals independent of the system in which they operate" (McMullen and Shepherd, 2006, p. 144). This would make alertness less of a predictor for entrepreneurial behavior but a kind of entrepreneurial behavior itself. In this context, it seems to be at least just as interesting to find out more about the antecedents of entrepreneurial alertness, which requires an integrated approach because alertness cannot be explained using exclusively behavioral or cognitive constructs (Frese and Gielnik, 2014). The present study contributes to this line of research, as epistemic curiosity can be added to the range of antecedents of alertness with a noteworthy impact.

The relevance of curiosity for entrepreneurship should not go unnoticed when examining conceptual models for the development of entrepreneurial behavior, such as the model proposed by Frese and Gielnik (2014). How exactly curiosity's strong influence is conveyed in the processes of developing an orientation toward entrepreneurial action should be subject to future research. Integrating epistemic curiosity in a more domain-specific reference has been the focus of a series of publications by Jeraj and Antoncic (2013), who introduced the concept of entrepreneurial curiosity, because they regarded other types of curiosity as too broad to be applied in an entrepreneurial context. They developed a measure specifically for the entrepreneurial context, referring to entrepreneurial tasks like market research, company improvement, and marketing strategies, which they report to be independent of other types of curiosity and linked to a range of constructs close to entrepreneurship, e.g., innovativeness and opportunity creation (Jeraj, 2014; Arikan et al., 2020). We encourage the domain-specific application of curiosity, yet the present results show that epistemic curiosity is already well suited to predict entrepreneurial outcomes. Whereas an entrepreneurial curiosity measure (Jeraj and Marič, 2013) can be used for established entrepreneurs that already had experience with entrepreneurial tasks, measures of epistemic curiosity have the advantage of being applicable to persons who have no prior connection with entrepreneurship.

Practical implications

As we found that epistemic curiosity is a promising predictor for entrepreneurship, the construct can be utilized in multiple practical appliances in the start-up context. There is a growing market for start-up academies and start-up coaches that aim to support nascent entrepreneurs by providing individual training and assistance (Hofmann, 2021). To construct appropriate coaching plans and further develop the clients' entrepreneurial qualities, psychological assessments can be helpful in identifying an individual's needs and opportunities for improvement (e.g., Entrepreneurial Mindset Profile; Davis et al., 2016). Notably, these measures may be enriched by adding epistemic curiosity as a construct, possibly leading to more accurate assessments and predictions of entrepreneurial potential. It might even be preferred

over previously used measures, for example those that include openness to experience. Epistemic curiosity should, therefore, play an essential role in the conception of new instruments for measuring what is often called the *entrepreneurial mindset*. In another avenue, epistemic curiosity may also be important to investors, as they may want to factor in an entrepreneur's curiosity when deciding whether to invest their start-up. Another important domain where epistemic curiosity can contribute is the promotion of nascent entrepreneurs. Considerable effort has been undertaken by governments to increase the rate of innovations and to support their country's start-up sector by funding institutions that aim to support entrepreneurs on their journey with advice, training, and financial support (Zinke et al., 2018). Research on the entrepreneurial psychology is relevant for the success of institutions fostering nascent entrepreneurs and should have a direct effect on the strategic alignment of these institutions (Barba-Sanchez et al., 2022). As a predictor for entrepreneurial behavior, curiosity can contribute to the work of these institutions, for example by identifying the need for further training. Showing young people that starting their own business is a promising career path—especially for highly curious people—should be used to encourage young adults and students to follow through on their ideas. In the context of entrepreneurial education initiatives, assessing and fostering curiosity in students could help increase the rate of young entrepreneurs and spark innovations (Zappe et al., 2018).

Limitations and future research directions

Further research efforts should investigate our findings using a wider array of methods. To achieve more profound knowledge about whether curiosity can also contribute to explain the success of an entrepreneur's business throughout later stages of the start-up process, future investigations should also use longitudinal designs. Future research efforts could go beyond early entrepreneurial outcomes like entrepreneurial intention and orientation and focus on criteria further along the entrepreneurial journey. These should include more extensive criteria to measure the success of a business, for example economic measures like financial status and growth rate, but also well-being and job-satisfaction of entrepreneurs and their employees.

A limitation concerning the comparability of the different curiosity measures refers to possible frame-of-reference effects (Schmit et al., 1995). The outcomes and the work-related curiosity scale both referred to an occupational context, whereas the second curiosity measure and the openness to experience scale did not refer to a specific context, which might explain the higher correlations between the work-related curiosity measure and the outcomes (Schulze et al., 2021). As the unspecific curiosity measure also strongly correlated with the entrepreneurial outcomes, the frame-of-reference effect seems at least uncritical.

A next step starting from the present results might be to explore exactly what kinds of curious behavior lead an entrepreneur to close the gap between recognizing an opportunity and making the decision to actually start a business. In this context, developing a conceptual model might be appropriate to connect behavioral expressions rooted in epistemic curiosity, such as active information seeking and knowledge acquisition, with entrepreneurial activities that can be objectively observed. Even though we did not find a moderating effect of participants' technology affinity, it is still likely that curiosity is of different importance for entrepreneurs in different sectors. In this context, future research should investigate how specific curiosity that is focused on a single field of interest (Hagtvedt et al., 2019), for example new technologies, can foster the process of engaging in an entrepreneurial activity. A differentiated view on individuals' interests and curiosity concerning specific domains could lead to different results for the relationship between curiosity and entrepreneurial outcomes.

Conclusion

Our study contributes to the entrepreneurship research by examining a key personality trait of the entrepreneurial personality and encouraging further research on this relationship. Empirical analyses from a quantitative study show that epistemic curiosity is closely related to entrepreneurial intention and orientation. In this context, epistemic curiosity was observed to be a better predictor for entrepreneurship than the broad Big-Five-factor openness to experiences and any sub-facets of openness to experiences. The size of the effect was in line with some of the most important predictors for business creation, such as self-efficacy and autonomy (Frese and Gielnik, 2014). Examining the nature of the relationship between curiosity and entrepreneurial outcomes, we found that the effect was mediated by entrepreneurial alertness. With this, we offer further evidence for personality traits activating the ability to identify opportunities which effectively leads to the formation of entrepreneurial intention and orientation toward an entrepreneurial career (Ardichvili et al., 2003; Shane and Nicolaou, 2015). We outline the role of alertness in this process, which builds on previous research establishing alertness as a mediator for multiple antecedents of entrepreneurial behavior (Lee Lim et al., 2014; Uy et al., 2015; Hu et al., 2018). Taking a closer look at this relationship would be interesting for future research efforts. Specifically, we are curious about how epistemic curiosity can be integrated in existing entrepreneurial models (e.g., Ardichvili and Cardozo, 2000; Douglas et al., 2021) and how valuable it will prove to be for predicting business success and other criteria in the entrepreneurial context.

Data availability statement

The datasets presented in this study are made available in the Open Science Framework (https://osf.io/) and can be found at:

https://osf.io/95vbq/?view_only=48fe194b2deb441bb61c2be56b5485b7.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

HH was responsible for drafting the manuscript and implemented the survey and conducted statistical analyses. HH, PM, and PS played important roles in the conceptualization process and in the writing of the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

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The impact of the big five personality variables on self-employment survival

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Based on large, representative Australian household panel, this study investigates to what extent the Big Five personality variables influence self-employment survival and differentiates between successful or unsuccessful exit. In addition, the influence of two moderating variables, tertiary education and the motivation to become self-employed, are considered. Contrary to expectations, we found no impact of the Big Fives variable on self-employment survival in general. In the case of unsuccessful exit, we found that entrepreneurs with a higher level of Conscientiousness tend to stay self-employed although they may not be satisfied with their job. Similarly, entrepreneurs with a tertiary education prolong unsuccessfully self-employment stints, particularly if they exhibit higher level of Emotional Stability. Necessity-driven entrepreneurs exit unsuccessful stints earlier, especially if they exhibit a lower level of conscientiousness.

KEYWORDS

big five – Personality, self-employment, employment survival, panel (longitudinal) data analysis, entrepreneurship

Introduction

The personality of entrepreneurs has received a lot of attention in entrepreneurship since the 1960s. Much of the early research in entrepreneurship consisted of a series of large-scale studies conducted in an effort to understand the personal traits and characteristics of the entrepreneur: these were mainly carried out by behavioural scientists from disciplines such as psychology and sociology (Landström et al., 2012). One of the most influential works in this respect is David McClelland's study "The Achieving Society" (1961). In this pioneer work, he demonstrated the link between the need for achievement in society and economic development.

By the late 1980s, several narrative reviews of the literature contended that there was no consistent relationship between personality and entrepreneurship (Gartner, 1988) and this stream of research eventually came to be regarded as something of a dead end. More recently, the role of personality in entrepreneurship has seen a revival as several meta-analyses provided evidence for the predictive validity of personality traits in entrepreneurship research (Rauch and Frese, 2006; Zhao and Seibert, 2006).

Overall, these recent studies suggest that the common variance of traits contribute to entrepreneurial behaviour. A substantial body of research indicates that personality variables play an important role in developing theories of the entrepreneurship process, including such areas as career choice (e.g., Zhao and Seibert, 2006; Caliendo et al., 2014), entrepreneurial cognition and opportunity recognition (e.g., Ardichvili et al., 2003), new venture survival (e.g., Ciavarella et al., 2004), and career success (e.g., Zhao et al., 2010; Wille et al., 2013).

To advance the field, scholars have suggested a need to clarify the role of personality in the entrepreneurship process though more longitudinal research (Hisrich et al., 2007). As past research has tended to focus on the start-up phase, it has been difficult to evaluate whether the personality variables are a predisposing factor or are learned from the role itself. In addition, personality characteristics that predict start-up behaviour may not predict behaviour later on in the entrepreneurship process. Rauch and Frese (2007) remarked that broad taxonomies of personality traits such as the Big Five have been less frequently used in entrepreneurship and that general traits have a lower predictability than specific traits such as locus of control or risk propensity. The heterogeneity of previous findings for personality variables suggests the presence of moderating variables which should be integrated in future research (Rauch and Frese, 2007).

The objective of this study is to investigate the impact of the Big Five personality variables (*Extroversion*, *Emotional Stability*, *Openness to Experience*, *Agreeableness*, and *Conscientiousness*) on self-employment survival by drawing on 12 waves of the Household, Income and Labour Dynamics in Australia (HILDA) survey. We define entrepreneurship in terms of self-employment, and we will use the terms 'entrepreneurs' and 'self-employed' interchangeably.

This study contributes to the field of psychology in entrepreneurship in three ways. First, we adopt a longitudinal approach, drawing on data which provide a sufficient time horizon to track self-employment survival in a meaningful way. In doing so, we aim for a more permanent effect. By investigating entrepreneurial stints and establishing when and why some individuals quit self-employment while others survive, this study sheds some light on the conditions for a sustainable entrepreneurship process. Second, our study complements previous research which attempted to evaluate the impact of the Big Five on entrepreneurial survival (Ciavarella et al., 2004; Caliendo et al., 2014) in that we differentiate between successful and unsuccessful exits. Third, we recognize that situational contingencies may be important and that there may be more than one type of entrepreneur or entrepreneurial venture (Zhao and Seibert, 2006). These different types of entrepreneurship may involve different skills and processes that require different theoretical explanations. Accordingly, we explore the impact of two moderating variables: tertiary education and financial prosperity.

Personality and entrepreneurship

Personality theory provides a valuable framework for understanding and hypothesizing associations between traits and experiences in various life domains, including vocational life (Hogan, 1991). In other words, what people do—their behaviour—is a function of the kind of people they are—their personalities. Hogan et al. (1996) showed that scores on well-developed measures of normal personality are stable over reasonably long periods of time and predict important occupational outcomes. As such, a central assumption of personality theory is that an individual possesses a predisposition to behave, think, and feel in a relatively consistent manner over time and across diverse situations. This relative cross-situational consistency is captured by the term "personality trait."

Personality has been conceptualized from a range of theoretical perspectives. After several decades of research on devising a general taxonomy of personality traits, a general consensus emerged in the early 1990s around the 'Big Five' (Barrick and Mount, 1991) personality dimensions: *Extroversion*, *Emotional Stability*, *Openness to Experience*, *Agreeableness*, and *Conscientiousness*. A substantial body of research has shown that several of the Big Five personality dimensions are related to employee job performance (e.g., Barrick and Mount, 1991; Rothman and Coetzer, 2003) and to entrepreneurial intentions and performance (Zhao et al., 2010).

In this study, we examine the impact of the Big Five on entrepreneurship survival and we distinguish between successful and unsuccessful exit as dependent variables at the end of the entrepreneurship stint. Specifically, we use the entrepreneur's job satisfaction in the last year of self-employment as a proxy for success. In doing so, we follow Wennberg and DeTienne's (2014) call to account for performance in empirical model when conducting research on entrepreneurship exit. As the authors remarked, "Many studies of exit in entrepreneurship have used exit to approximate the 'failure' of a new firm." (Wennberg and DeTienne, 2014; p: 9) There is a need for a more nuanced approach: in the eyes of many entrepreneurs, exit and failure are two distinct concepts (Headd, 2003). We posit that job satisfaction can provide a synthetic perception of the success of the self-employment exit, capturing the satisfaction derived from the work content, meaningfulness, and remuneration. This perspective is particularly relevant is in the context of new independent firms, which are often run by one or a few entrepreneurs, and where the destiny of the firm is intimately linked to that of its owner(s).

The Big five personality variables

In recent years, there has been an increased interest about the potential effect of the Big Five on entrepreneurship. In a first meta-analysis, Zhao and Seibert (2006) found significant differences between entrepreneurs and managers on four personality dimensions with entrepreneurs showing higher scores of

Extroversion, *Conscientiousness* and *Openness to Experience*, and a lower score of *Agreeableness*. In a subsequent meta-analysis, Zhao et al. (2010) found that four of the Big Five personality dimensions were positively associated with entrepreneurial intentions and performance, with *Agreeableness* failing to be associated with either.

Ciavarella et al. (2004) were the first to analyze the relationship between the Big Five and venture survival. They found that the entrepreneur's *Conscientiousness* was positively related to long-term venture survival and that *Extroversion*, *Emotional Stability*, and *Agreeableness* had no impact on survival. Contrary to their expectations, they found a negative relationship between *Openness to Experience* and long-term survival. However, Ciavarella et al. (2004) study suffered from two methodological weaknesses: a biased sample (graduates of a Southeastern university in the United States) and a small sample size (111 respondents, with only 57 included in the survival analysis).

A recent study by Caliendo et al. (2014) investigated the impact of the Big Five on the decision to become and stay self-employed by drawing on a large, representative German household panel. They observed the expected influence for just one dimension: the higher individuals score in *Agreeableness*, the higher their exit probability, revealing that low levels of *Agreeableness* positively support entrepreneurial survival.

In this section, we briefly describe each of the Big Five dimensions. We also report on the results of previous empirical studies which have investigated the impact of the Big Five in organizational behaviour and we formulate a series of hypotheses on how these personality dimensions relate to survival in self-employment.

Extroversion. This dimension refers to the degree of sociability or withdrawal that a person tends to exhibit. Extroverts are typically assertive, dominant, energetic, active, talkative, and optimistic. Introverts prefer to spend more time alone and are characterized as reserved, quiet, and independent. *Extroversion* is characterized by positive evaluations of life in general and career in particular (Clark and Watson, 1991), and there is evidence of positive associations between *Extroversion* and indicators of intrinsic career success such as job satisfaction (McCrae and Costa, 1991). Extroverted individuals tend to be cheerful, sociable, and seek excitement and stimulation, thus enabling them to develop social networks more easily, which may result in stronger partnerships with suppliers and customers (Baker, 1994). Another trait of *Extroversion* is the assertiveness of the individual (Barrick and Mount, 1991), and *Extroversion* has been identified as a strong predictor of leadership (Judge et al., 2002).

Although these traits have been identified as important for managers, it is plausible that all parts of the factor—building networks, being assertive and seeking leadership— are positively related to entrepreneurship. Social networks play a central role during the start-up and development stage. Entrepreneurs get support, knowledge, and access to finance and distribution channels through their social networks. They are also linked to other entrepreneurs and organizations in their industry and their region, and these contacts can widen the availability of resources that sustain a new firm. Thus,

> *Hypothesis 1*: The greater the entrepreneur's *Extroversion*, the longer the survival in self-employment.

Emotional stability. This dimension is also frequently referred to its converse—neuroticism. Emotionally stable individuals are characterized as usually calm, even-tempered, relaxed and able to face stressful situations without becoming upset. Individuals with a low level of *Emotional Stability* tend to experience a number of negative emotions including anxiety, hostility, impulsiveness, and vulnerability (McCrae and Costa, 1991). Studies investigating the relationship between *Emotional Stability* and job satisfaction have consistently found a positive correlation (Judge et al., 1998). Emotionally stable individuals can manage day-to-day performance pressure, remain optimistic, and generally maintain positive working relationships with coworkers (Hurtz and Donovan, 2000).

Entrepreneurs must be able to deal with uncertainty and stress when they launch a business venture. A large proportion of start-ups close in the first few years after they are established and there is an extra pressure to succeed when entrepreneurs invest their own money in the venture. In addition, the work of entrepreneurs is characterized by high pace and fragmentation within a relatively unstructured environment where they have the primary responsibility for all aspects of the venture (Mueller et al., 2012). Individuals with a high level of *Emotional Stability* should be able to tolerate these stressful situations. Similarly, those who are confident and self-secure are expected to prevail in this environment, resulting in a higher self-employment survival. Thus,

> *Hypothesis 2*: The greater the entrepreneur's *Emotional Stability*, the longer the survival in self-employment.

Agreeableness. An agreeable person is fundamentally altruistic, sympathetic to others and eager to help them, and in return believes that others will be equally helpful (John and Srivastava, 1999). A high level of *Agreeableness* characterizes cooperative individuals and a preference for interpersonal relationships. Conversely, someone at the low end of the dimension can be described as self-centered and hard-bargaining. *Agreeableness* leads to interpersonal trust which enhances collaboration, mutual supportiveness and shared norms and values.

In the field of entrepreneurship, Cable and Shane (1997) viewed the ability to build trusting relationships as a key factor to secure capital and future support from venture capitalists. In addition, agreeable entrepreneurs are better positioned to build alliances with other firms. For example, cooperation though product development alliances is an increasingly popular strategy that experienced and well-connected entrepreneurs use to cope with competitive markets and pioneering technologies (Eisenhardt and Schoohoven, 1996). We posit that entrepreneurs must exhibit *Agreeableness* to develop quality relationships with co-founders,

employees, investors, suppliers and customers. This should increase their survival in self-employment and lead to a positive assessment of their entrepreneurial stint when they exit the market. Thus,

> *Hypothesis 3*: The greater the entrepreneur's *Agreeableness*, the longer the survival in self-employment.

Conscientiousness. This dimension contains two components. The first component reflects dependability. Conscientious individuals are careful, thorough, responsible, and organized (Barrick and Mount, 1991). The second component underpins volitional variables, suggesting that conscientious individuals are strong-willed, determined, and persistent. *Conscientiousness* has been found to be a consistent predictor of job performance across occupations involving managing others and sales performance (Hurtz and Donovan, 2000).

McClelland (1961) was the first to propose that individuals with a high need for achievement would be prone to become entrepreneurs because they have personal control over outcomes and are rewarded according to their own efforts. Conscientious entrepreneurs are hardworking, achievement-oriented, and persevering (Ciavarella et al., 2004), and this increases their persistence in self-employment. In their meta-analysis, Zhao and Seibert (2006) reported that entrepreneurs have a higher level of *Conscientiousness* than managers. These arguments suggest that conscientious entrepreneurs will have a longer survival in self-employment. Thus,

> *Hypothesis 4*: The greater the entrepreneur's *Conscientiousness*, the longer the survival in self-employment.

Openness to experience. People scoring low on openness tend to be conventional in behaviour and conservative in outlook. They prefer the familiar to the novel, and their emotional responses are somewhat muted. People scoring high on openness tend to be imaginative, broad-minded, curious, and non-traditional (Costa et al., 1991). Open-minded people have strong tendencies to seek out unfamiliar situations that allow for greater access to new experiences and perspectives. They are willing to entertain novel ideas and unconventional values, and they experience both positive and negative emotions more keenly than do closed individuals (Rothman and Coetzer, 2003).

Creativity, innovation, and change are all at the core of recent definitions of entrepreneurship (Shane and Vankataraman, 2000). This process requires intelligence and curiosity to acquire new knowledge, to combine resources and to develop innovative strategies to address unmet market needs. According to Patel and Thatcher (2014), *Openness to Experience* enables accurate assessments of environmental needs and enhances the creativity that is necessary to solve everyday problems and develop effective reactions to problems associated with small businesses. Thus,

> *Hypothesis 5*: The greater the entrepreneur's *Openness to Experience*, the longer the survival in self-employment.

Moderation by education and financial prosperity

Past research found substantial unexplained variation in effect sizes for *Emotional Stability*, *Extroversion*, and *Openness to Experience* (Zhao and Seibert, 2006). In addition, several scholars have noted that there may be more than one type of entrepreneur or entrepreneurial venture and that these different types of entrepreneurship may involve different skills and processes that require different theoretical explanations (Ciavarella et al., 2004; Millán et al., 2012). This suggests that situational contingencies are important and points to the existence of moderators of the personality–entrepreneurship relationship. We consider two contingencies which are likely to affect self-employment entry and survival: education attainment and financial prosperity.

Tertiary education. Over the past decades, education has been described as a central component of human capital. Human capital theory assumes that people attempt to receive a compensation for their investments in human capital (Becker, 1975). Conceptually, education is thought to be linked to entrepreneurial efficiency and successful firm growth (Ertuna and Gurel, 2011) as individuals try to maximize their economic benefits given their human capital. We posit that the completion of a tertiary education will further strengthen the personality traits which will lead to entrepreneurship survival: Entrepreneurs who have a tertiary degree tend to set-up high value-added businesses where the personality of the owner-manager is likely to play a prevalent role. PhD graduates are unlikely to launch 'mum and pop stores' for which the rules of success and survival are well-established; instead, these individuals may pursue high value-added activities by leveraging on their personality, knowledge, ability and network. Amongst the Big Five, we argue that tertiary education will primarily be a moderator for *Conscientiousness*, *Emotional Stability*, and *Openness to Experience*.

University-educated people generally have good employment prospects and therefore face high opportunity costs to become self-employed (Cassar, 2006). Accordingly, they will want to minimize mishaps when pursuing a business idea and are thus likely to plan the launch of their business venture carefully and in an organized fashion, drafting for example a business plan or asking for advice. Once they have entered entrepreneurship, they are likely to raise their expected income from alternative employment and thus have higher performance requirements to remain in business (Unger et al., 2011). These outcomes tend to reinforce the dependability and volitional dimensions of *Conscientiousness*. More generally, the completion of a tertiary degree requires a lot of motivation and focus (O'Connor and Paunonen, 2007). The sense of purpose, hard work, and achievement gained by entrepreneurs during university studies is likely to motivate them in the pursuit of their venture idea later in their life.

Higher education invariably necessitates taking numerous examinations, completing assignments with tight deadlines, and thus dealing with stressful situations (O'Connor and Paunonen, 2007). Individuals with a tertiary education are therefore likely to have a high level of *Emotional Stability*, enabling a self-confident and relaxed approach to challenges. Later in their life, these individuals are well-equipped to deal with the uncertainty and stress of a new business venture and to persist in their project. Conversely, neurotic individuals tend to be anxious, depressed, insecure, and fearful (Chamorro-Premuzic and Furnham, 2003). They are more likely to experience anxiety and stress, compromising their performance.

Higher education is also likely to enhance *Openness to Experience* through the promotion of universalism, self-direction, and stimulation values (Roccas et al., 2002). These values emphasize intellectual and emotional autonomy, acceptance and cultivation of diversity and pursuit of novelty and change. The completion of a tertiary degree essentially requires individuals to consider new ideas. Entrepreneurs with higher education may be better able to manage new learning essential to both academic achievement and new business ventures, which in turn might increase persistence in entrepreneurship.

Consequently, we posit that the completion of tertiary education will strengthen the impact of *Conscientiousness*, *Emotional Stability*, and *Openness to Experience* on self-employment survival. Thus,

> *Hypothesis 6a*: The relationship between the entrepreneur's *Conscientiousness* and survival in self-employment is stronger for entrepreneurs with tertiary education.
>
> *Hypothesis 6b*: The relationship between the entrepreneur's *Emotional Stability* and survival in self-employment is stronger for entrepreneurs with tertiary education.
>
> *Hypothesis 6c*: The relationship between the entrepreneur's *Openness to Experience* and survival in self-employment is stronger for entrepreneurs with tertiary education.

Financial prosperity. There is a long tradition in economics and entrepreneurship to examine the relationship between wealth and business creation. Many studies have documented the positive relationship that exists between personal assets and the propensity to start a business and have interpreted this result as evidence of the existence and importance of liquidity constraints (Evans and Jovanovic, 1989; Fairlie and Krashinsky, 2012). Wealth matters for business ventures survival too. Holtz-Eakin et al. (1994) for example showed that liquidity constraints exert a noticeable influence on the viability of entrepreneurial enterprises.

Financial prosperity is therefore an important contingency variable in entrepreneurship: individuals who are financially prosperous are more likely to become and to remain self-employed. Even in under-performing ventures, financial prosperity is likely to prolong self-employment stints while entrepreneurs hope for a turnaround or an unexpected bonanza. Several studies suggested that entrepreneurs at the helm of such ventures remain committed to their project and continue to invest in a struggling venture (Åstebro et al., 2007).

We posit that financial prosperity will strengthen the relationship between three of the Big Five (*Extroversion*, *Emotional Stability*, *Openness to Experience*) and employment survival. First, financial prosperity is likely to increase the positive evaluations of life of extroverts in general and of their careers as entrepreneurs in particular. Having sufficient funds at their disposal will further boost extroverts who are characterized as cheerful and sociable and encourage them to stay self-employed. Second, we posit that financial prosperity will strengthen the impact of *Emotional Stability* on the length of self-employment survival. Sufficient funds provide entrepreneurs with a breathing space, reducing stress and anxiety, increasing their job satisfaction, and in turn increasing their persistence in entrepreneurship. In a similar fashion, financial prosperity is likely to alleviate their immediate liquidity worries, allowing them to better focus on other day-to-day pressing issues. This may in turn reinforce *Emotional Stability* and also prolong self-employment. Third, we anticipate that financial prosperity will strengthen the relationship between the entrepreneur's *Openness to Experience* and survival in self-employment. Having sufficient funds allows open-minded entrepreneurs to further acquire new knowledge, test new formulae and try unconventional methods to solve customers' problems. This in turn increases innovation and the likelihood of success in entrepreneurship. Thus,

> *Hypothesis 7a*: The positive relationship between the entrepreneur's *Extroversion* and survival in self-employment is stronger for financially prosperous entrepreneurs.
>
> *Hypothesis 7b*: The positive relationship between the entrepreneur's *Emotional Stability* and survival in self-employment is stronger for financially prosperous entrepreneurs.
>
> *Hypothesis 7c*: The positive relationship between the entrepreneur's *Openness to Experience* and survival in self-employment is stronger for financial prosperous entrepreneurs.

Materials and methods

Sample

We used data from the first 12 waves of the Household, Income and Labour Dynamics in Australia (HILDA) survey. HILDA is a nationally representative longitudinal household survey initiated by the Australian government. Initiated in 2001,

the first wave covered 19,914 individuals in 7,682 households. In wave 11 this sample was topped up with an additional 2,153 households and 5,477 individuals.

Our sample contains entrepreneurship stints that started between 2002 and 2012. Stints that were already running in 2002 are not considered: Their inclusion in the sample would lead to a systematic underrepresentation of short stints. This procedure indeed reduces the sample size but ensures a fair representation of all stint lengths. In this sense, our sample presents a left truncation problem (or delayed entry).

The sample includes all types of entrepreneurs regardless of whether they had incorporated their business or not. In other words, our definition of entrepreneurs includes both owner-managers who operate their own incorporated businesses and people who operate their own unincorporated business. Individuals can have multiple self-employment stints. In our analysis, we solely consider the first observed stint. Including all stints would lead to an over-representation of individuals with multiple short stints and could thus lead to a bias. A total of 182 double self-employment stints are therefore excluded. This yields a total of 1,621 stints which we considered in this study. To check for robustness, we also ran the analysis based on the second observed stint (for entrepreneurs who have multiple stints). The regression results are provided in Appendix 1. They are comparable to those obtained in the original analysis. Relying on the second, rather than the first observed stints means that less exits are observed, and that consequently less stints can be classified as un−/successful. This, at least partially, explains the weaker significance levels.

Cohorts. Entrepreneurs exit self-employment through different means. For example, successful entrepreneurs might exit through an initial public offering or a trade sale, while unsuccessful entrepreneurs might be forced to wind up their business or to file for bankruptcy. The decision to exit and the exit strategy thus depend on the entrepreneur's success. To differentiate between the types of exit, we rely on the entrepreneur's job satisfaction in the last year of self-employment. Entrepreneurs with an above-median job satisfaction are coded as successful exit, the remainder as unsuccessful. A similar approach was adopted by Bates (2005), who asked entrepreneurs to assess their success after exit. Following this definition, our sample contains 213 successful and 573 unsuccessful stints. A further 835 stints cannot be classified because they were still running in the last year under analysis.

Context

We acknowledge that entrepreneurship does not take place in a vacuum. A mix of attitudes, resources, and infrastructure, which altogether form the entrepreneurial ecosystem, are needed to support entrepreneurial activity. As highlighted by Thukral (2022), Australia has a good entrepreneurial ecosystem. Specifically, Australia provides favourable framework conditions for start-ups and Australian's perceptions, attitudes, and beliefs towards entrepreneurship are generally positive. Australia, therefore, can be characterized as an "enabling context" (Stephan, 2018) for entrepreneurship marked by relative resource affluence, predictability, ease of transactions, and high legitimacy for entrepreneurs.

Variables and measures

Dependent variable

The dependent variable is the length of the entrepreneurial stints. It indicates the survival in self-employment. In some cases, only upper and lower bounds of the stint-length can be established. This occurs when the entrepreneur does not respond to the HILDA survey for a period that overlaps with the entrepreneurship exit. We distinguish between successful and unsuccessful entrepreneurship stint by measuring the entrepreneurs' job satisfaction in the last year of self-employment. Job satisfaction was measured by the single item: "All things considered, how satisfied are you with your job?"

Personality variables

The Big Five were measured with a 36-item inventory derived from Saucier (1994) set of adjectives. Participants were asked to rate how well each of the adjectives describes them using a 7-point scale (1 = does not describe me at all, 7 = describes me very well). Following this, a principal component analysis was performed. Internal reliability was assessed using Cronbach's alpha: *Agreeableness* ($\alpha = 0.78$); *Conscientiousness* ($\alpha = 0.78$); *Emotional Stability* ($\alpha = 0.83$); *Extroversion* ($\alpha = 0.73$) and *Openness to Experience* ($\alpha = 0.73$).

The personal variables were measured in wave 5 and 9. When the individual's personality is not assessed in wave 5 we used information from wave 9. Personality traits are generally assumed to be stable among working-age adults (Hogan, 1991; John and Srivastava, 1999), and the values we observed remained consistent across the waves. The mean differences of personality scores between the wave 5 and wave 9 lie between −0.20 (*Agreeableness*) and 0.27 (*Openness to Experience*). This suggests that the error introduced by combining the values of the two waves is small.

Moderating variables

Our model includes two moderators: tertiary education and financial prosperity. Tertiary education was measured as dummy variable (0 = no tertiary education, 1 = at least one tertiary degree) at the beginning of the entrepreneurship stint. Financial prosperity was measured with a single item: "Given your current needs and financial responsibilities, would you say that you and your family are…" The responses 'prosperous', 'very comfortable', and 'reasonably comfortable' were coded as financially prosperous. The responses 'just getting along', 'poor', and 'very poor' were coded as not financially prosperous. Because the prosperity can change over

time, we considered only the last known value before leaving self-employment.

Control variables

The following control variables are considered: gender (0 = male; 1 = female), age and age squared/100 (scaling of age is done to obtain regression coefficients of larger magnitude), migration background (0 = Australian native, 1 = migrant), and incorporation of business (0 = no; 1 = yes). All these variables (excepted financial prosperity) are captured at the beginning of the entrepreneurial stint.

Analysis approach

We analyzed the survival dynamics of self-employment and differentiate between successful or unsuccessful exits. This was achieved by using two Multiple Risk Survival Models. The first model analyzes the characteristics of successful stints whereas the second model analyses the characteristics of unsuccessful stints. In the model for successful stints, the observations of unsuccessful stints are right censored at the time of exit. This approach has been widely adopted in past studies on entrepreneurship survival (Ciavarella et al., 2004; Millán et al., 2012). The survival lengths were modeled using a Weibull distribution. This parametric model allows for the inclusion of covariates of the survival times and of interval censored data (i.e., stint lengths for which only lower and upper bounds can be established). Traditional semi-parametric approaches for survival analysis such as the Cox regression lack this capability in their standard form.

In our parametric model, the entrepreneurial stint lengths were assumed to come from the Weibull distribution with density function: $f(t) = k\lambda t^{k-1} e^{-\lambda t^k}$ with time t, shape parameter $k > 0$ and scale parameter $\lambda > 0$. The shape parameter k indicates how the exit rate changes over time. For $k < 1$, the exit rate decreases with time, for k = 1 it stays constant and, for $k > 1$, it increases with time. The reciprocal of the scale parameter λ indicates the time interval until ~63.2% of entrepreneurs have ended their stint.

The shape parameter k was assumed to be unaffected by the covariates. The shape parameter λ was regressed as: $\lambda = \lambda_0 + \vec{\beta}'\vec{x}$ where λ_0 and $\vec{\beta}$ are regression parameters. The covariates thus modify the length of survival but not the exit rate change.

Two-hundred and thirty-one individuals (~14%) did not take the personality test. To retain these individuals in the sample, the values were mean-imputed. The results prove robust under moderate alterations. The covariates age, age^2/100, and the Big-Five personality measures where centered before running the analysis. The descriptive statistics show the unaltered values. To take HILDA's complex sampling method into account, we added the relevant terms for clustering and stratification. With 96 stratas, the model has 118 degrees of freedom. Finally, the observations were weighted using the weights provided by HILDA.

Results

Table 1 shows the means, variances, and correlations of covariates for the whole sample, the successful stints, and the unsuccessful stints. In addition to the (un-) successful stints, the whole sample also contains stints that were not classifiable because they were still running at the end of the observation period. Consequently, the mean 'lower stint length bound' for the whole sample (2.86 years) lies above the mean for successful stints (1.84 years) and unsuccessful stints (2.28 years).

The control variables' means are very similar for the two types of exit. Interestingly, the share of females in both samples is relatively high: 38% (unsuccessful) and 49% (successful). One possible explanation is HILDA's stratification of the sample. Entrepreneurs of unsuccessful stints show lower scores in all personality dimensions.

We tested for multicollinearity among the covariates (gender, age, incorporation of business, migration, tertiary education, financial prosperity) and the Big Five personality variables by computing the variance inflation factors (VIFs). They range from 1.03 to 1.13, and, for unsuccessful stints, they range from 1.05 to 1.19. These values lie well below the recommended threshold of 10 (Neter et al., 1985). Overall, the correlation matrix suggests that personality constructs used in this study are not correlated and clearly distinct, and that they can be included in the analysis of the self-employment phenomenon.

Table 2 summarizes the regression results of both survival analyses. The results for successful stints are shown on the left and the results for unsuccessful stints are shown on the right side of the table. The scale parameters exp. (−0.04) = 0.96 for successful stints and exp. (−0.07) = 0.93 for unsuccessful stints are both smaller than 1. The risk of exit thus decreases with time. The risk of exit decreased faster for unsuccessful entrepreneurs. Our model fits the data very well (successful stints $\chi^2 = 323.36$, $p < 0.00$; unsuccessful stints $\chi^2 = 359.66$, $p < 0.00$ with 118 degrees of freedom).

Successful stints tend to be longer ($M = 3.61$ years) than unsuccessful stints ($M = 2.35$ years). The control variables offer interesting insights. Gender and age significantly influence the length of successful stints, but not the length of unsuccessful stints. Male entrepreneurs and older entrepreneurs tend to have longer successful stints. The effect is strongest at young ages and then flattens out. Successful stints of 21-year-old are 0.18 years longer than the ones of 20 year olds. Between 64-and 65-year-old entrepreneurs, the difference is only 0.07 years. The incorporation of a business leads unsuccessful entrepreneurs to exit earlier. A migration background significantly decreases the length of self-employment stints, irrespective of the success perceived.

As shown in Table 2, we find support for the influence of *Extroversion* on the stint length of both, successful and unsuccessful entrepreneurs. Higher *Extroversion* leads entrepreneurs to remain longer in self-employment (successful +0.20, unsuccessful: +0.09). Hypothesis 1 is thus accepted. *Agreeableness* significantly shortens successful stints (−0.37 years), but has no significant effect on the

TABLE 1 Descriptive statistics and correlation matrix.

		Total stints (N = 1,621)		Unsuccessful stints (N = 573)																					
		Mean	Var	Mean	Var	1		2		3		4		5		6		7		8		9		10		11		12		Mean	Var
1	Lower stint length bound	2.86	6.70	1.84	2.68			0.07		0.03		−0.01		0.00		−0.02		−0.01		−0.05		0.08		0.09	*	−0.03		−0.03		2.28	4.06
2	Female	0.41	0.24	0.49	0.25	0.10				0.04		0.10	*	−0.09	*	0.02		0.07		0.02		0.03		0.28	***	0.08		−0.02		0.38	0.24
3	Age	41.78	162.53	41.60	173.02	−0.01		0.11				0.04		−0.04		0.13	**	0.03		−0.15	***	0.17	***	0.04		0.04		0.00		39.87	125.12
4	Business incorporation	0.42	0.24	0.28	0.20	−0.02		−0.02		−0.01				0.06		0.07		0.15	***	−0.09	*	−0.01		−0.09		0.02		0.23	***	0.26	0.19
5	Migration background	0.28	0.20	0.40	0.24	−0.06		−0.06		0.12		0.01				0.05		0.07		0.03		0.00		−0.01		0.07		−0.01		0.45	0.25
6	Tertiary education	0.21	0.17	0.17	0.14	−0.07		−0.06		0.01	**	0.00		0.09				0.03		0.00		0.03		0.04		0.09	*	0.03		0.22	0.17
7	Financial prosperity	0.67	0.22	0.79	0.17	−0.05		−0.03		−0.03		0.19	*	0.07		0.08				0.06		−0.01		−0.05		0.11	*	−0.05		0.64	0.23
8	Extroversion	4.00	1.22	4.06	1.43	−0.03		−0.03		0.13		0.09	*	0.14	*	0.13		0.08				0.01		−0.01		0.03		0.01		4.00	1.22
9	Emotional stability	4.59	0.90	4.77	1.01	0.05		0.06		−0.01		−0.09		0.16		0.17		−0.01		0.10				0.05		−0.04		0.03		4.50	0.83
10	Agreeableness	3.98	0.69	4.18	0.70	0.09		0.09	**	0.13		0.13		−0.06		0.00		0.08		−0.08		−0.03				−0.07		−0.10		3.93	0.70
11	Conscientiousness	4.19	0.93	4.28	0.94	0.02	*	0.02		0.19		0.00		−0.14		0.07		0.00		−0.08		−0.06		−0.14				−0.13	**	4.13	0.85
12	Openness to experience	3.84	1.00	3.87	1.23	−0.15		−0.15		0.02		−0.01	***	−0.08		0.03		0.05		0.03		0.03		−0.12		0.01				3.84	0.92
		Successful stints (N = 213)																											

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

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TABLE 2 Impact of the big five on self-employment survival stints (regression results).

	Successful stints			Unsuccessful stints		
	Effect		SE	Effect		SE
(Intercept)	3.61	***	0.33	2.35	***	0.26
Gender	−0.32	***	0.10	−0.09		0.06
Age	0.13	***	0.02	0.01		0.02
Age²/100	−0.13	***	0.02	0.01		0.02
Incorporation of business	0.15		0.10	−0.13	*	0.06
Migration background	−0.20	*	0.10	−0.25	***	0.10
Openness to experience	0.17		0.09	−0.09		0.05
Conscientiousness	−0.14		0.08	−0.05		0.05
Extroversion	0.20	*	0.08	0.09	*	0.06
Agreeableness	−0.37	***	0.12	0.00		0.07
Emotional stability	−0.09		0.06	−0.06		0.10
Tertiary education	0.06		0.11	0.10		0.08
x Openness to experience	−0.08		0.13	0.06		0.09
x Conscientiousness	0.24	*	0.11	−0.03		0.07
x Extroversion	−0.46	***	0.09	−0.17	***	0.05
x Agreeableness	0.02		0.14	0.09		0.08
x Emotional stability	0.11		0.11	0.12		0.08
Financial prosperity	0.09	*	0.10	0.29	***	0.06
x Openness to experience	0.25	*	0.10	0.10		0.06
x Conscientiousness	0.00		0.11	0.12		0.07
x Extroversion	−0.07		0.10	−0.12		0.08
x Agreeableness	0.24		0.14	0.10		0.08
x Emotional stability	0.12		0.11	0.24	***	0.07
(Log Scale)	−0.04		0.03	−0.07	***	0.02
χ^2	323.36			359.66		
Degrees of freedom	118			118		
p	0.00			0.00		
N	1,621			1,621		

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

length of unsuccessful stints. Hypothesis 3 is partially accepted. The remaining effects of personality are not significant. This leads to the rejection of hypotheses 2, 4 and 5.

Tertiary education does not directly influence the time of (un-) successful exit in general. Yet, it moderates the effect of *Conscientiousness* on the length of successful stints. Entrepreneurs with higher *Conscientiousness* and a tertiary education delay successful exits. Hypothesis 6a is therefore accepted. Additionally, tertiary education inverts the earlier description of *Extroversion* on stint lengths. University educated extroverts tend to opt for an earlier exit, rather than to extend their stint, compared with their peers without tertiary education. We found no moderating effect of tertiary education on the relationship between the entrepreneur's *Emotional Stability* and self-employment survival, and on the relationship between the entrepreneur's *Openness to Experience* and self-employment survival. Hypotheses 6b and 6c are therefore rejected.

Overall, financial prosperity prolongs self-employment stints. This effect is stronger for unsuccessful entrepreneurs: Being financially prosperous, they can postpone the exit of their business venture. Financial prosperity strengthens this effect for entrepreneurs with high *Emotional Stability*. In the case of successful stints, financial prosperity strengthens the impact of *Openness to Experience* on the stint length. Similarly, in the case of unsuccessful stints, financial prosperity strengthens the effect if *Emotional Stability* on self-employment survival. Therefore, Hypothesis 7b is accepted and Hypothesis 7c is partially accepted. We found no evidence for a moderation of financial prosperity on the relationship between the entrepreneur's *Extroversion* and survival in self-employment. Therefore, Hypothesis 7a is rejected.

Robustness tests

We performed three robustness checks. The results can be found in Appendix 1. First, when an entrepreneur has multiple stints, we chose the first observed stint to increase the number of classifiable stints (i.e., stints that ended within the observation period). To ensure this did not bias the results, we reran the calculations using the second observed stint (where there were multiple stints). The coefficients closely resemble the ones of the original model. For the

successful stints, two exceptions exist: *Agreeableness* loses in significance—potentially because fewer stints are classifiable as un/successful; and financial prosperity x *Emotional Stability* becomes significant. The effect retains its sign but becomes much stronger.

Second, we reran the analyses using the concept of 'personality profile', which combines the Big-Five into one measure. This approach was pioneered in a study about adolescents with an entrepreneurial Big Five constellation, characterized by high *Extroversion*, *Conscientiousness*, and *Openness*, and low *Agreeableness* and *Neuroticism*, and who were more likely than others to search for opportunities and develop entrepreneurial skills (Schmitt-Rodermund, 2004). A recent stream of research showed that this personality profile is a particularly robust predictor for entrepreneurial behaviour (Obschonka et al., 2010, 2013). As shown in Appendix 1, the control variables are comparable to the original model; the comparison demonstrates that an entrepreneurial personality leads to significantly longer self-employment stints.

Finally, we ran a log-logistic-based survival analysis. This analysis allows the hazard function to be non-monotonic (i.e., the risk of exit can increase for a certain time, and then decrease again). The resulting scale parameters are smaller than 1 for both cases [successful: exp. (−0.20) = 0.82; unsuccessful: exp. (−0.31) = 0.73], which implies that the best-fitting hazard function is monotonically decreasing. The usage of a Weibull distribution is thus adequate. The resulting covariates are very similar to the original values. However, differences exist in the significance levels.

Discussion

With respect to entrepreneurship self-employment survival in general, we found evidence for a significant impact of *Extroversion* and *Agreeableness*. Specifically, higher *Extroversion*, which characterizes people as outgoing, gregarious, optimistic, and sociable, has a positive influence on the length of entrepreneurship stints. Although there is little evidence thus far about the impact of *Extroversion* on entrepreneurship from the literature on the Big Five, our results are in line with Lee and Tsang (2001) who found that high performing entrepreneurs tend to be more extroverted. Such entrepreneurs have more frequent communication with their business contacts and tend to have a larger number of contacts or a greater breadth of communication. More generally, extroverted entrepreneurs and their business ventures have been described as 'active' and 'outward-looking', in contrast to 'passive' and 'inward-looking' (Malecki and Poehling, 1999). As the quantity of information and the complexity of running a new venture grows, a high degree of external awareness, global information monitoring, and a capacity to develop effective social networks will favour entrepreneurs of all stripes. These characteristics are the hallmark of extroverted people.

In addition, *Agreeableness* significantly shortens successful stints, but has no significant effect on the length of unsuccessful stints. Therefore, entrepreneurs who end a successful stint tend to exhibit a low score in *Agreeableness,* pointing to self-centered and hard-bargaining traits. This finding is consistent with Caliendo et al. (2014) study of personality characteristics on entrepreneurship survival. The authors observed an influence for just *Agreeableness*: the higher the entrepreneur's *Agreeableness*, the higher their exit probability, and therefore shorter self-employment stints. Contrary to much of the literature on entrepreneurship which bears a distinctly positive valence, our finding suggests that entrepreneurs can be Janus-faced in that positive attributes, such as resilience, self-efficacy, and need for achievement may sometimes devolve naturally into ruthlessness (Miller, 2015). After all, highly successful entrepreneurs, such as Bill Gates, Steve Jobs, and Mark Zuckerberg have been variously portrayed to be ruthless in their dealings with competitors, partners, and employees alike. An example of this lack of empathy is Elon Musk's reaction when Mary Beth Brown, his longtime assistant, asked for a pay rise. Confronted with this request, he said he wanted to see if he could do her job, and then fired her instead (Vance, 2015).

As suggested by the previous studies on liquidity constraints (Holtz-Eakin et al., 1994; Fairlie and Krashinsky, 2012), our results indicate that entrepreneurs who are financially prosperous prolong their self-employment stint no matter if the exit is considered successful or unsuccessful. In doing so, they can invest in their established and successful business venture to grow it further. But financial prosperity may have a downside: instead of culling a poor project, the availability of liquidity may lead to an escalation of commitment where the entrepreneur continues to invest in a struggling venture. Conversely, our results show that tertiary education has no impact on the length of self-employment stints in general.

Considering education as a moderator, we observed that entrepreneurs with a tertiary degree prolong successful stints when they also have high scores in *Conscientiousness*. Tertiary education reinforces the effect of *Conscientiousness* and makes strong-willed, hard-working individuals persist in self-employment. The completion of a tertiary degree is likely to reinforce the dependability and volitional dimensions of *Conscientiousness*. The sense of purpose, hard work, and achievement gained by entrepreneurs during university studies is likely to motivate graduates in the pursuit of their venture idea later in their life. Conversely, tertiary education shortens self-employment stints of extroverted people.

The moderating effects of financial prosperity are in line with the theory on liquidity constraints (Fairlie and Krashinsky, 2012). Our findings suggest that financial prosperity strengthens the effect of *Openness to Experience* in prolonging successful entrepreneurship stints. Financial resources thus reinforce tendencies to seek out unfamiliar situations, to entertain novel ideas and try new ways to provide products and services. In other words, *Openness to Experience* allows entrepreneurs to engage in exploration activities through search, experimentation, and variation—all activities that increase the survival chance of a business venture (Volery et al., 2015). In addition, for unsuccessful stints, financial prosperity reinforces the effect of *Emotional Stability* on self-employment survival. Therefore, the availability of financial income and wealth further strengthen the tendency of unsuccessful entrepreneurs, who experience positive moods and

emotions, to stick to a relatively unsuccessful project. Accordingly, for financially prosperous entrepreneurs, *Emotional Stability* may increase commitment and psychological inertia, causing them to postpone divestment for longer than rational reasoning would advise them to do (Sandri et al., 2010).

Conclusion

The present study contributes to the vast stream of research on the personality of entrepreneurs. More specifically, we investigated the influence of the Big Five personality variables on entrepreneurial survival by drawing on a unique, representative dataset, the Household, Income and Labour Dynamics in Australia (HILDA) survey.

Our study makes two main contributions to the entrepreneurship and psychology literature. First, there have been heated debates about the role of personality in entrepreneurship (Gartner, 1989; Rauch and Frese, 2006; Zhao and Seibert, 2006). The current study extends our understanding of the role of personality in the entrepreneurship process. With respect to self-employment survival in general, we found evidence for a significant impact of *Extroversion* and *Agreeableness*. In a similar study, Patel and Thatcher (2014) found that greater *Openness to Experience* had a positive effect on self-employment survival, whereas individuals lower on *Emotional Stability* were less likely to persist in self-employment. For their part, Ciavarella et al. (2004) found that only *Conscientiousness* was positively related to long-term venture survival, and that there was a negative relationship between the entrepreneur's *Openness to Experience* and long-term venture survival. Overall, our results, together with past research, suggest that the impact of the Big Five on self-employment survival is limited and, at best, inconclusive. While the personality structure of entrepreneurs is often distinctive compared to that of managers (Zhao and Seibert, 2006) and personality can play an important role in entrepreneurship entry (Zhao and Seibert, 2006; Caliendo et al., 2014), there exists a wide range of other factors which influence self-employment. These factors are most likely to be inherent to the business venture (e.g., profitability, growth, dynamic capabilities) and the industry (e.g., level of competition, environmental munificence), rather than to the personality of the entrepreneur.

Second, this study considered the role of tertiary education and financial prosperity as moderators to mitigate some of the heterogeneity identified in previous studies. In addition, we differentiated between successful and unsuccessful stints to account for performance at the time of exit. As suggested by the literature on liquidity constraints (Holtz-Eakin et al., 1994; Fairlie and Krashinsky, 2012), our results indicate that financially prosperous entrepreneurs prolong their self-employment stints regardless of whether the exit is considered successful or unsuccessful. Considering moderating effects, financial prosperity strengthens the effect of *Openness to Experience* in prolonging successful entrepreneurship stints. Recent research highlighted that openness personality factor may be the most important to predict entrepreneurship entry (Antoncic et al., 2015) and subsequent venture growth (Auer Antoncic et al., 2018). Our findings, suggest that this personality trait might be an important antecedent not only for starting a new business venture, but to remain involved with the business when the personal financial situation of the entrepreneur is stable. For unsuccessful stints, financial prosperity reinforces the effect of *Emotional Stability* on self-employment survival.

The findings suggest that tertiary education has no direct impact on self-employed survival. In line with human capital theory, we would have expected that entrepreneurs with tertiary education shorten their self-employment stint if it is unsuccessful. Given their qualification, they would expect to get a well-paid job as an employee, which raises their opportunity cost. If the venture was not performing according to their expectations, it was anticipated that they would exit quickly as they try to maximize their economic benefits given their human capital (Becker, 1975). However, these predictions did not materialize. Similarly, the moderating impact of tertiary education is limited: Tertiary education prolongs successful stints of conscientious entrepreneurs, and, conversely, it shortens both successful and unsuccessful self-employment stints of extroverted entrepreneurs.

The research also has some limitations. First, we base our analysis solely on data from Australia. Its history and similarity in culture suggests that the findings may also apply to European and North American contexts, but its validity in other regions of the world is unclear. Second, 835 stints could not be classified because they were still running in the last year under analysis. Third, entrepreneurs were asked to state how satisfied they were with their job at the end of their self-employment stint. In some circumstances, participants might have changed their opinion on their job during their stint. We could not take this change into account. Other measures of success should be considered in future studies. For example, entrepreneurs could be asked to reflect on their overall entrepreneurial experience, or whether they reached their personal and business goals. Finally, the scope of the personality variables considered in the present study was limited to the Big Five traits. It would be of interest to include other personality characteristics matching entrepreneurial tasks such as locus of control, need for achievement, and risk-taking propensity.

In conclusion, while the Big Five personality traits have been shown to influence entrepreneurship entry in past research, they play a relatively minor role in exit decisions and entrepreneurship survival in general. A fruitful avenue for future studies on survival could be to consider firm-level variables and to examine the interplay between personality and organization. Variables at the interface between these two levels, such as job satisfaction, job demand control, social support, and work-life balance could complement research on personality and bridge the gap with other streams of research in the entrepreneurship and organizational behaviour disciplines.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found at: https://www.dss.gov.au/about-the-

department/longitudinal-studies/living-in-australia-hilda-household-income-and-labour-dynamics-in-australia-overview.

Author contributions

The authors conducted the statistical analysis and wrote this manuscript in its entirety as a team. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Appendix 1

	Second stint				Entrepreneurial personality			
	Successful stints		Unsuccessful stints		Successful stints		Unsuccessful stints	
	Effect	SE	Effect	SE	Effect	SE	Effect	SE
(Intercept)	3.67***	0.67	2.01***	0.24	3.55***	0.35	2.36***	0.28
Gender	−0.29***	0.09	−0.02	0.06	−0.43***	0.09	−0.05	0.07
Age	0.13***	0.02	0.02	0.02	0.12***	0.02	0.01	0.02
$Age^2/100$	−0.13***	0.03	0.00	0.02	−0.12***	0.02	0.01	0.02
Incorporation of business	0.19	0.10	−0.10	0.07	0.11	0.10	−0.15*	0.06
Migration background	−0.27**	0.10	−0.25***	0.07	−0.21	0.10	−0.25***	0.07
Openness to experience	0.14	0.09	−0.02	0.05				
Conscientiousness	−0.15	0.09	−0.05	0.05				
Extroversion	0.16*	0.08	0.10*	0.04				
Agreeableness	−0.23*	0.12	−0.03	0.07				
Emotional stability	−0.14	0.11	−0.10	0.06				
Tertiary education	0.05	0.12	0.12	0.08	0.11	0.10	0.10	0.07
x Openness to experience	0.06	0.16	0.00	0.09				
x Conscientiousness	0.26*	0.11	0.01	0.07				
x Extroversion	−0.41***	0.10	−0.02	0.06				
x Agreeableness	−0.09	0.15	0.13	0.08				
x Emotional Stability	−0.01	0.11	0.09	0.10				
Financial prosperity	0.04*	0.11	0.35***	0.06	0.02	0.10	0.27***	0.06
x Openness to experience	0.26*	0.11	0.06	0.07				
x Conscientiousness	−0.04	0.11	0.11	0.07				
x Extroversion	−0.11	0.10	−0.19**	0.06				
x Agreeableness	0.12	0.14	0.06	0.08				
x Emotional stability	0.26*	0.11	0.26***	0.07				
Entrepreneurial personality					0.08*	0.04	0.01*	0.03
x financial prosperity					0.06	0.05	0.02	0.03
x tertiary education					−0.09	0.05	0.03	0.03
(Log Scale)	−0.04	0.04	−0.07***	0.02	−0.03	0.03	−0.06***	0.02
χ^2	322.83		351.65		279.06		324.44	
Degrees of freedom	119		119		106		106	
p	0.00		0.00		0.00		0.00	
N	1621		1621		1621		1621	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

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Research on factors affecting serial entrepreneurial intention: An interpretive structure model

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Serial entrepreneurship is a very common phenomenon in the world. Research on serial entrepreneurs is the core of understanding entrepreneurship and entrepreneurs, such as, why entrepreneurs insist on starting businesses many times? What affects the sustainability of entrepreneurship? Based on the interpretive structure model of systems engineering, this study constructs a hierarchical model of the factors affecting serial entrepreneurial intention, which proposed the basic conditions, key factors, and paths affecting serial entrepreneurial intention. Based on this, the hierarchical model of factors affecting serial entrepreneurial intention is also tested through a typical serial entrepreneurial case. The results show that: (1) there are 16 factors affecting serial entrepreneurial intention, and each factor plays a role at a specific level; (2) entrepreneurial expectations and identification and evaluation of opportunities are the key factors affecting serial entrepreneurial intention. We can improve the ability of the identification and evaluation of opportunities through entrepreneurial failure learning, and form reasonable entrepreneurial expectations; (3) entrepreneurial cognitive schema and behavioral addiction tendency directly affect entrepreneurs' identification and evaluation of opportunities; (4) demographic factors, financial conditions, environmental conditions, and entrepreneurial experience are the basic conditions that affect serial entrepreneurial intention indirectly through emotional perception and motivation factors.

KEYWORDS

serial entrepreneurial intention, entrepreneurial reentry, interpretive structure model, entrepreneurial expectations, entrepreneurial cognitive schema, behavioral addiction tendency

Introduction

Serial entrepreneurs are not limited to one entrepreneurial activity. They are representatives of entrepreneurial active groups (Vaillant and Lafuente, 2019), and the practice of serial entrepreneurship is more and more common in all countries. Furthermore, research on serial entrepreneurs is the core of understanding

entrepreneurship and entrepreneurs (MacMillan, 1986), especially the sustainability of entrepreneurship. Studies have shown that serial entrepreneurs may be more likely to succeed over time (Cope, 2005) and show a more positive attitude toward entrepreneurial failure (Politis, 2008). However, when entrepreneurial activities succeed or fail, some entrepreneurs choose to end their entrepreneurial career, while others choose to start again. The intention of entrepreneurs to start again is called serial entrepreneurial intentions (Simmons et al., 2016). As Simmons asked, what are the factors that affect entrepreneurs' choice to start again? The serial entrepreneurship intention has attracted more and more interest in the field of entrepreneurship studies.

The existing studies mainly focus on the factors affecting serial entrepreneurial intentions from three perspectives. The first one is the comparative study, which compares serial entrepreneurship with novice entrepreneurship and portfolio entrepreneurship, to obtain the characteristics of serial entrepreneurship and the factors affecting serial entrepreneurial intention. For example, the ability to recognition of opportunity is more likely to be associated with serial entrepreneurship and portfolio entrepreneurship, and higher opportunity exploration ability is associated with portfolio entrepreneurship rather than serial entrepreneurship and novice entrepreneurship (Parker, 2014). The second perspective is entrepreneurial reentry. After failure of entrepreneurship, entrepreneurs can choose to close enterprises to enter the labor market or to start a new one, and the latter will become serial entrepreneurs. At present, the research on entrepreneurial reentry mainly focuses on distress exits and failure loss, entrepreneurial learning from failure, and failure attribution (Ucbasaran et al., 2003; KoÇAk et al., 2011; Lin and Wang, 2018; Williams et al., 2020). The last one is the antecedent variables affecting serial entrepreneurial intention, mainly including the characteristics of entrepreneurs, traits and entrepreneurial experience, and so on (Plehn-Dujowich, 2009; Spivack et al., 2014; Hsu et al., 2017b; Simmons et al., 2018; Williams et al., 2020). To sum up, the factors affecting serial entrepreneurial intention are complex, and the achievements of relevant research are rich. However, due to the relatively scattered perspectives, the internal structure of how the complex factors affect serial entrepreneurial intention is unclear, so a definite hierarchical model needs to be established.

This study has sorted out 36 factors that may affect serial entrepreneurial intention based on the literature review. After the analysis and discussion of the expert group, 16 factors are finally formed. Then, using the method of interpretive structure model, the hierarchical structure is obtained, which proposes the mutual relationship and multilevel structure of the factors affecting serial entrepreneurial intention. Moreover, this study further tests the hierarchical structure model of factors affecting serial entrepreneurial intention through a case study.

Literature review

Serial entrepreneurs are more likely to run their businesses more successfully. Success may make entrepreneurs fall into the trap of complacency and perform poorly in subsequent entrepreneurship, whereas if failed entrepreneurs can bear the "sadness" that may prevent them from returning to entrepreneurship, they will learn from failure and improve themselves (Shepherd, 2003). Entrepreneurs with failed entrepreneurial experience are 17% less likely to restart a business than entrepreneurs with successful entrepreneurial experience (Amaral et al., 2011). Existing studies show that the factors influencing serial entrepreneurial intention can be categorized into 16 individual factors, 12 entrepreneurial level factors, and eight environmental factors as presented in **Table 1**.

Individual factors

The individual factors affecting serial entrepreneurial intention are mainly studied from two perspectives. First of all, personal traits. Some studies have pointed out that both Sensation-seeking trait disposition (A1) and workaholism trait disposition (A2) will affect serial entrepreneurship (Carr et al., 2016); The psychological, emotional, and physiological aspects of entrepreneurial experience strengthen the behavioral addiction to entrepreneurship (A3), which will promote individuals to repeatedly carry out entrepreneurial activities (Spivack et al., 2014). In addition, age and gender are also important factors affecting serial entrepreneurship. The older the entrepreneur's age (A4), the slower the speed of restarting (Lin and Wang, 2018). Career stages (A9) are related to the possibility of entrepreneurs' reentry after failure, the relationship of which is inverted U shaped (Baù et al., 2017). Moreover, males score higher than females on openness factor which may be the most important factor of the big five personality, which differentiates entrepreneurs from other people (Antoncic et al., 2015). Gender moderates the negative relationship between the perceived lack of support barrier and the entrepreneurial intention, which exposes some cross-cultural differences, and that females (relative to males) perceive the lack of support barrier, fear of failure, and lack of competency barriers as more important in entrepreneurial activities (Shinnar et al., 2012). Probability of female entrepreneurs (A5) returning to entrepreneurial activities after failure is less than that of males (Simmons et al., 2018).

Individual psychological perception is another perspective from which many scholars also put forward the factors affecting serial entrepreneurial intention. Some studies have pointed out that the perceived failure loss (A6) has a slightly significant negative impact on the speed of entrepreneurial reentry (Lin and Wang, 2018), however, when the perceived failure loss

TABLE 1 Identified factors of serial entrepreneurial intention.

Notation	Factors	Type of research	Relationship	References
Individual factors				
A1	Sensation-seeking trait disposition	Quantitative	Positive	Carr et al., 2016
A2	Workaholism trait disposition	Quantitative	Positive	Carr et al., 2016
A3	behavioral addiction to entrepreneurship	Qualitative	Related	Spivack et al., 2014
A4	Age	Quantitative	Negative	Lin and Wang, 2018
A5	Gender	Quantitative	Related	Shinnar et al., 2012; Antoncic et al., 2015; Simmons et al., 2018
A6	Failure loss	Quantitative	Positive/negative	Lin and Wang, 2018
A7	Perceived financial gains (prior venture)	Quantitative	Negative	Hsu et al., 2017b
A8	Performance feedback from prior business	Quantitative	Negative	Carr et al., 2016
A9	Career stage	Quantitative	Inverted U shaped	Baù et al., 2017
A10	Emotional intensity and emotional valence	Qualitative	Related	Williams et al., 2020
A11	Positive/negative emotion	Qualitative	Related	Williams et al., 2020
A12	Risk aversion	Conceptual	Related	Parker, 2014
A13	Anxiety	Quantitative	Related	Zelekha et al., 2018
A14	Confidence	Qualitative	Related	Hayward et al., 2010
A15	Entrepreneurial self-efficacy	Quantitative	Positive	Antoncic et al., 2016; Hsu et al., 2017b; Antoncic et al., 2021
A16	Prevention focused cognition	Quantitative	Negative	Simmons et al., 2016
Entrepreneurial factors				
A17	The length of venture creation experience	Quantitative	Positive	Hsu et al., 2017a
A18	Entrepreneurial failure	Quantitative	Positive/negative	Lafuente et al., 2018; Tian and Cao, 2021
A19	Entrepreneurial success	Quantitative	Positive	Amaral et al., 2011
A20	Harvest exits/Distress exits	Quantitative	Positive/negative	Simmons et al., 2016
A21	Expectation of new venture's prospects and existing business	Qualitative	Related	KoÇAk et al., 2011
A22	Entrepreneurial learning from failure	Quantitative	Positive	KoÇAk et al., 2011; Tian and Cao, 2021
A23	Entrepreneurial cognitive schema	Quantitative and deductive	Related	Vaillant and Lafuente, 2019
A24	Opportunity identification	Conceptual	Related	Parker, 2014
A25	Opportunity evaluation	Qualitative	Related	KoÇAk et al., 2011; Carbonara et al., 2019
A26	Entrepreneurial experience	Quantitative and deductive	Positive	Stam et al., 2008; Vaillant and Lafuente, 2019
A27	Entrepreneurial skill	Conceptual	Related	Plehn-Dujowich, 2009
A28	Failure attributions	Quantitative/qualitative	Related	Ucbasaran et al., 2003; Williams et al., 2020
Environmental factors				
A29	Relational capital	Qualitative	Related	KoÇAk et al., 2011
A30	Structural capital	Qualitative	Related	KoÇAk et al., 2011
A31	Social capital (family/friend support)	Quantitative	Positive	Stam et al., 2008; Lin and Wang, 2018
A32	Bankruptcy laws	Quantitative	Related	Lee et al., 2011
A33	Stigma of entrepreneurial failure	Quantitative	Related	Simmons et al., 2013
A34	Visibility of information about prior failures	Quantitative	Related	Simmons et al., 2013
A35	Labor market rigidity	Quantitative	Positive	Fu et al., 2018
A36	Market volatility	Quantitative	Negative	Zhang and Wang, 2020

is very huge, entrepreneurs may be motivated by failure to reenter into entrepreneurial activities (McGrath, 1999). The more individuals actively describe their entrepreneurial experience according to perceived financial gains (A7) or losses from their prior venture, the weaker their subsequent entrepreneurial intention is, and vice versa (Hsu et al., 2017b).

The individuals who receive positive performance feedback (A8) from prior ventures have strong serial entrepreneurial intentions (Carr et al., 2016). At the same time, studies have shown that individual emotions also have a significant impact on serial entrepreneurial intention. Negative emotion (A11) is not necessarily an obstacle to reentry into entrepreneurial activities as previously thought, the interaction between controllability and emotion is the core of explaining entrepreneurial reentry (Williams et al., 2020). Moreover, it is further found that the interaction between failure attribution and emotional intensity/emotional valence (A10) will affect the way of individual entrepreneurial reentry (Williams et al., 2020). Entrepreneurs with high-risk aversion are more likely to be novice entrepreneurs, while entrepreneurs with low-risk aversion (A12) are more likely to be serial entrepreneurs (Parker, 2014). Entrepreneurial failure will make entrepreneurs anxious (A13). The higher degree of anxiety, the greater the tendency of a person to become a salaried employee after the first entrepreneurial failure. The less anxious he is, the more inclined he is to regard entrepreneurship as a way of life and adhere to it in entrepreneurial behavior (Zelekha et al., 2018). In addition, scholars have pointed out that entrepreneurs' psychological capital is one of the factors affecting serial entrepreneurship intention. Entrepreneurs with more confidence (A14) can better recover from emotional, cognitive, social, and economic ventures, and are more likely to conduct subsequent ventures (Hayward et al., 2010). As the dimensions of entrepreneurial self-efficacy, financial self-efficacy and marketing self-efficacy are related to entrepreneurial intention. Family business environment may be very important for individuals to develop financial self-efficacy, which affects entrepreneurial intention (Antoncic et al., 2021), and that individuals with higher marketing self-efficacy are more likely to create a firm (Antoncic et al., 2016). Under the same conditions, the higher the entrepreneurial self-efficacy (A15), the higher the subsequent entrepreneurial intention. Moreover, the degree of entrepreneurial self-efficacy will moderate the impact of financial loss after entrepreneurial failure on subsequent entrepreneurial intentions (Hsu et al., 2017b). There is also a significant negative correlation between prevention-focused cognition (A16), which is one of the regulatory focuses of entrepreneurs, and serial entrepreneurial intention (Simmons et al., 2016).

Entrepreneurial level factors

The entrepreneurial level factors may directly affect the serial entrepreneurial intention. Firstly, many studies have shown that entrepreneurial experiences can affect the serial entrepreneurial intention, such as the length of venture creation experience (A17), experienced entrepreneurial failure (A18) (Hsu et al., 2017a; Lafuente et al., 2018). However, domestic scholars also proposed that entrepreneurial failure has a positive impact on serial entrepreneurial intention (Tian and Cao, 2021). Entrepreneurs with entrepreneurial success (A19) are more likely to reenter faster (Amaral et al., 2011). Exit mode is an important factor affecting serial entrepreneurship intentions. If entrepreneurs are the prevention focus, distress exits (A20) reduce the serial entrepreneurial intention of such entrepreneurs (Simmons et al., 2016). In addition, entrepreneurs' expectations of new venture's prospects (A21) or current business can affect the motivation of entrepreneurs, which provides incentives for entrepreneurs to reenter entrepreneurial activities (KoÇAk et al., 2011).

Second, entrepreneurial cognition is also an emphasized factor affecting serial entrepreneurial intention. Domestic scholars put forward that entrepreneurial failure affects the willingness to start a business again through entrepreneurs' learning from failure (A22) (Tian and Cao, 2021), which has been proved to be the "entrepreneurial catalyst" to entrepreneurial reentry (KoÇAk et al., 2011). The learning process generated from past entrepreneurial experiences may affect the entrepreneurial cognitive schema (A23), which may be important for the decision to set up a new company (Vaillant and Lafuente, 2019). Moreover, opportunity identification (A24) and opportunity appraisal (A25) are the key factors affecting entrepreneurs to become a serial entrepreneur, which provide the inducement to reenter into entrepreneurial activities (KoÇAk et al., 2011; Parker, 2014; Carbonara et al., 2019). Studies also proposed that failure attribution (A28) is one of the factors affecting the way to effectively reenter into entrepreneurship after failure (Williams et al., 2020), and that those entrepreneurs who attribute success to internal factors will become habitual entrepreneurs (Ucbasaran et al., 2003). Furthermore, attribution to internal and controllable factors has a significant positive impact on their serial entrepreneurial intention (Zhu et al., 2021).

Third, existing studies focus on the human capital affecting serial entrepreneurship intention (Carbonara et al., 2019). Relevant studies have further verified that human capital seems to be positively associated with the revival of entrepreneurship, in which entrepreneurial experience (A26) has the strongest impact, and the second is the general human capital (Stam et al., 2008). The past entrepreneurial experience, whether positive or negative, will significantly affect the entrepreneurial reentry (Vaillant and Lafuente, 2019). An entrepreneur with high entrepreneurial skills (A27) will continue to operate if he has enough profits. When the expectation of existing venture's prospects is negative, he will choose to become a serial entrepreneur (Plehn-Dujowich, 2009).

Environmental factors

Environmental factors are also important factors affecting serial entrepreneurial intention. First of all, the social capital

of entrepreneurs. Studies have shown that the strong or weak relationship in structural capital (A30) plays a crucial role in the process of entrepreneurial reentry. Strong relationship can support entrepreneurs from exit to reentry, while weak relationship plays a key role in recognizing and taking advantage of new opportunities. Meanwhile, relational capital (A29) in the form of trust has great benefits in the process of entrepreneurial reentry and can promote interpersonal relations and subsequent business transactions (KoÇAk et al., 2011). Entrepreneurs with family or friend support (A31) seem to adhere to their preference for entrepreneurship without being intimidated by negative entrepreneurial events (Stam et al., 2008). Although family support can provide multiple resources and psychological support for serial entrepreneurs and help entrepreneurs recover from negative entrepreneurial events, the impact of family support on serial entrepreneurial intention is not direct, but mixed (Lin and Wang, 2018).

Second, there are legal factors affecting serial entrepreneurial intention. Studies have shown that a friendly bankruptcy law (A32) can reduce barriers to reentry, which means less time and less cost, and give entrepreneurs a new start by encouraging them to take more risks and set up more new companies (Lee et al., 2011).

Third, social factors can also affect serial entrepreneurial intention. In the environment with low visibility of information about prior failures (A34) and high public stigma of entrepreneurial failure (A33), failed entrepreneurs are more likely to engage in entrepreneurial activities again (Simmons et al., 2013). Some studies have proposed that the labor market rigidity (A35) increases the possibility of individuals' reentry into entrepreneurial activities, and market volatility (A36) also affects the relationship between entrepreneurial learning from failure and serial entrepreneurial intention (Zhang and Wang, 2020).

To sum up, according to the literature review, there are 16 factors affecting serial entrepreneurial intention after categorization of 36 factors as given in **Table 2**.

Materials and methods

Methods

Interpretative structural model (ISM) is a kind of structure modeling technique, which was developed by Professor Warfield to analyze the problems related to complex social and economic systems (Warfield, 1978; Muruganantham et al., 2018). The ISM refers to a process that transforms unclear and poorly articulated models of systems into visible and well-defined models (Sushil, 2012). This method decomposes the complex system into several sub-system elements, extracts the interaction mechanism between the elements of the complex system with practical experience and knowledge, and finally formed a theoretical construct (Valmohammadi and Dashti, 2016). Compared with the traditional empirical analysis method of influencing factors, the ISM method is characterized by dynamically supplementing the required data according to the research progress. Given its advantages in dynamicity, complementarity and integrity, ISM method has been applied to many studies in the field of management, such as human resource, entrepreneurship, and engineering management (Mandal and Deshmukh, 1994; Wei et al., 2019; Liu et al., 2021).

The main concepts involved in the paper include general matrix, adjacency matrix, reachability matrix, and the highest-level element set. A general matrix is a rectangular table with m rows and n columns composed of i × j numbers, and the element a_{ij} represents the element in row i and column j.

The adjacency matrix describes the direct relationship between each row and column of factors. For the general system S (F_1, F_2,..., F_n) with n factors, the adjacency matrix is defined as A = [a_{ij}]n × n, where a_{ij} = 1 (when element F_i has a direct effect on F_j) or 0 (when elements F_i have no direct effect on F_j).

The reachable matrix is used to represent the direct or indirect relationship between the influencing factors. Using the operational properties of Boolean matrices, the reachable matrix R satisfies the equation: $(A + I)^{k-1} \neq (A + I)^k = (A + I)^{k+1} = R$, where A represents the adjacency matrix, I represents the identity matrix, and K represents the number of operations.

Highest-level element set refers to a set of elements that cannot reach other elements except themselves. $R(F_i)$ refers to the reachable set of F_i and $C(F_j)$ represents the antecedent set of F_j. If $R(F_i) = R(F_i) \cap C(F_j)$ (where i = j), $R(F_i)$ is placed in a set corresponding to the level and excluded in the analysis of subsequent levels, then $R(F_i)$ is the highest-level element set (Hussain et al., 2016).

This paper uses ISM method to carry out a study on the factors influencing serial entrepreneurial intention, including four steps. This paper firstly identifies the antecedent factors of SEI through literature review. Secondly, an expert group is set up to screen out the important factors from the antecedent factors and determine the relationship between the factors. Thirdly, using statistical software (e.g., MATLAB), we design the relationship structure of each factor and obtain the corresponding reachability matrix. Fourthly, this research carries out hierarchical processing and forms a multilevel conceptual model based on the reachability matrix.

Analysis

Existing literature has studied the antecedents of serial entrepreneurial intention from multiple perspectives. We firstly identify 16 factors (as shown in **Table 2**) through literature review to help further screen by the expert panel.

In the second step, an expert panel was established to clarify the key factors affecting SEI and interrelation of 16

TABLE 2 Identified factors of serial entrepreneurial intention.

Notation	Critical factors	Descriptive definition	Category
F1	Behavioral addiction tendency	The tendency to seek out a feeling or action intensely and continuously. (A1, A2, A3)	Individual factor
F2	Demographic factors	Demography, age and gender. (A4, A5)	Individual factor
F3	Financial conditions	The economic performance of entrepreneurship. (A6, A7, A8)	Individual factor
F4	Social capital	The intangible resources that entrepreneurs derive from their position in the social structure, such as trust, support, and social networks. (A29, A30, A31)	Environmental factor
F5	Entrepreneurship experience	Entrepreneur has been undergone in entrepreneurial activity, length of the startup, success or fail. (A17, A18, A19, A20)	Entrepreneurial factor
F6	Entrepreneurial expectation	Entrepreneurs' expectations for the future development of current entrepreneurial or future entrepreneurial activities. (A21)	Entrepreneurial factor
F7	Emotion perception	Entrepreneurs perceive their emotion as positive or negative, or anxious. (A10, A11, A13)	Individual factor
F8	Psychological capital	The positive psychological state of the entrepreneur which provide the psychological resources to promote performance. (A14, A15)	Individual factor
F9	Entrepreneurial learning from failure	Entrepreneurs learn from the entrepreneurial failure. (A22)	Entrepreneurial factor
F10	Career stage	The career stage of the entrepreneur, early, middle and late. (A9)	Individual factor
F11	Human capital	knowledge, skills, abilities, etc. of an entrepreneur. (A26, A27)	Entrepreneurial factor
F12	Environment conditions	Environmental factors which effect entrepreneurship, including economy, government, social culture and laws. (A32, A33, A34, A35, A36)	Environmental factor
F13	Entrepreneurial cognitive schema	The cognitive structures developed in entrepreneurship which deal with different entrepreneurial situation. (A23)	Entrepreneurial factor
F14	Opportunity identification and evaluation	Entrepreneurs identify and evaluate opportunities in the entrepreneurship. (A24, A25)	Entrepreneurial factor
F15	Failure attributions	Entrepreneurs consider the reason which lead to entrepreneurial failure. (A28)	Entrepreneurial factor
F16	Motivation factors	Internal motivations and dynamics that regulate or influence entrepreneurial behavior. (A16, A12)	Individual factor

TABLE 3 Pair-wise comparison of 16 factors.

The type of the relationship between factors F_i and F_j															Critical factors
O	O	V	O	O	O	O	O	O	O	O	X	O	O	A	Behavioral addiction tendency (F_1)
V	V	V	V	O	V	O	V	V	V	O	V	O	V		Demographic factors (F_2)
V	O	O	O	O	O	O	V	O	V	V	O	O			Financial conditions (F_3)
O	O	V	O	O	O	O	O	V	O	O	X				Social capital (F_4)
O	O	V	V	O	V	O	V	V	V	V					Entrepreneurship experiences (F_5)
A	O	A	A	A	A	O	O	A	O						Entrepreneurial expectation (F_6)
O	O	V	O	O	O	O	V	O							Emotion perception (F_7)
O	O	O	O	O	O	O	X								Psychological capital (F_8)
O	A	O	X	O	V	O									Entrepreneurial learning from failure (F_9)
O	O	O	V	O	V										Career stage (F_{10})
O	V	V	V	O											Human capital (F_{11})
V	O	V	O												Environment conditions (F_{12})
O	V	V													Entrepreneurial cognitive schema (F_{13})
A	A														Opportunity identification and evaluation (F_{14})
A															Failure attributions (F_{15})
															Motivation factors (F_{16})

factors. The panel consists of seven members, including two scholars in the research field of entrepreneurship, three serial entrepreneurs, and two doctoral students. After all the members of the expert panel understand the basic concepts of SEI and the 16 antecedents, they further judged back-to-back whether the 16 factors had an important impact on SEI. The result of the discussion showed that 16 factors were unanimously agreed by more than four members (Kuo et al., 2010).

Thirdly, the relationship between 16 factors was discussed and seven members of the expert panel were asked to conduct a pair-wise comparison of 16 factors. We denoted the 16 factors as F_i, where i = 1, 2, ..., 16, as given in Table 2. The experts were asked to select from one of the following four types when judging the relationship between the factor F_i and F_j:

- Type V: factor F_i influences factor F_j directly
- Type A: factor F_j influences factor F_i directly
- Type X: factor F_i influences factor F_j each other
- Type O: factor F_i and factor F_j are mutually unrelated

In the process of judging the relationship between factors, we still adopt the opinions of most experts (more than four members), and the final relationship between the 16 elements presented is unanimously confirmed by all the members, as presented in Table 3.

In the fourth step, we used matrix operations to divide the 16 important influencing factors into different levels and thus get a multilevel ISM. A 16 × 16 square matrix was used to express the logical correlation among the important factors affecting SEI based on Table 3, forming an adjacency matrix A that covers any two or two elements in the whole influencing factors system. In this matrix, a_{ij} refers to the elements in line i and column j of a square matrix (i, j = 1, 2, ..., 16), indicating the relationship between factors F_i and F_j. "0" in row i and column j represents that factor i has no direct influence on the factor j, while "1" indicates factor i directly influences factor j. The results expressed in 16 × 16 adjacency matrix from Table 3 are presented in Table 4.

As the influencing factors of complex systems are not directly related, we use the reachability matrix (R) to obtain the relationship between the direct and indirect effects of one factor on other factors, as well as the transitive representation of each factor. In order to express the transfer relationship between the direct or indirect effects of 16 factors, we need to convert adjacency matrix into reachable matrix.

Element r_i can reach r_j by the distance of unit 1, and r_j can still reach the next influencing factor by the distance of unit 1 in the reachability matrix. We add adjacent matrix A and unit matrix I to get matrix B, which can further get the reachability matrix through Boolean algebraic power operation with the help of software MATLAB. According to the operation rules of transforming adjacent matrix into reachable matrix, we calculate Bn until the calculation satisfies $B^{k-1} = B^k$ (K = 15), which shows direct and indirect relationships among 16 influencing factors of SEI, as is presented in Table 5.

Results

Based on reachability matrix, this paper sorts out the highest-level element set. When R(Fi) = R(Fi)∩C(Fi), R(Fi) is placed in a set corresponding to the level and excluded in the analysis of subsequent levels. This paper continues to find the new highest-level elements from the remaining reachability matrix, and then finds the highest-level elements contained in each level by analogy. For example, after the first hierarchical process, the element satisfies $R(F_i) = R(F_i) \cap C(F_i)$ is 6, so {6} is the first level. After that, 14 is found to satisfy the condition after the element containing 6 is removed from the list, so 14 is the second layer. In the same way, this paper divides these 16 factors

TABLE 4 Adjacency matrix A of 16 factors.

No	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9	F_{10}	F_{11}	F_{12}	F_{13}	F_{14}	F_{15}	F_{16}
F_1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
F_2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F_3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
F_4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
F_5	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0
F_6	0	0	1	0	1	1	0	1	0	0	1	1	1	1	0	1
F_7	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0
F_8	0	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0
F_9	0	1	1	0	1	0	1	1	1	0	0	0	1	0	1	0
F_{10}	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
F_{11}	0	1	0	0	1	0	0	0	1	1	1	0	0	0	0	0
F_{12}	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
F_{13}	0	1	0	0	1	0	0	0	1	1	1	0	1	0	0	0
F_{14}	1	1	0	1	1	0	1	0	0	0	1	1	1	1	1	1
F_{15}	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	1
F_{16}	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1

TABLE 5 Reachability matrix R of 16 factors.

No	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9	F_{10}	F_{11}	F_{12}	F_{13}	F_{14}	F_{15}	F_{16}
F_1	**1**	0	0	1	1	1	1	1	1	0	1	0	1	1	1	0
F_2	1	**1**	1	1	1	1	1	1	1	0	1	0	1	1	1	1
F_3	0	0	**1**	0	0	1	1	1	1	0	1	0	1	1	1	1
F_4	1	0	0	**1**	1	1	1	1	1	0	1	0	1	1	1	0
F_5	1	0	0	1	**1**	1	1	1	1	0	1	0	1	1	1	0
F_6	0	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0
F_7	0	0	0	0	0	1	**1**	1	1	0	1	0	1	1	1	0
F_8	0	0	0	0	0	1	0	**1**	1	0	1	0	1	1	1	0
F_9	0	0	0	0	0	1	0	1	**1**	0	1	0	1	1	1	0
F_{10}	0	0	0	0	0	1	0	1	1	**1**	1	0	1	1	1	0
F_{11}	0	0	0	0	0	1	0	1	1	0	**1**	0	1	1	1	0
F_{12}	0	0	0	0	0	1	0	1	1	0	1	**1**	1	1	1	1
F_{13}	0	0	0	0	0	1	0	1	1	0	1	0	**1**	1	1	0
F_{14}	0	0	0	0	0	1	0	0	0	0	0	0	0	**1**	0	0
F_{15}	0	0	0	0	0	1	0	1	1	0	1	0	1	1	**1**	0
F_{16}	0	0	0	0	0	1	0	1	1	0	1	0	1	1	1	**1**

Bold values represent the correlation between each element and itself is 1.

into six levels, and the final multilevel structure hierarchy is presented in Table 6. The final hierarchical results were obtained as follows:

- Level 1: 6
- Level 2: 14
- Level 3: 8, 9, 11, 13, 15
- Level 4: 7, 10, 16
- Level 5: 1, 3, 4, 5, 12
- Level 6: 2

Based on the reachability matrix and highest-level element sets, the multi-level structure hierarchy chart of serial entrepreneurship intention is drawn, from which interpretive structure model of key factors affecting serial entrepreneurship intention is obtained (as shown in Figure 1). According to the figure, factors affecting serial entrepreneurship intention show a multilevel hierarchical structure with six levels. The specific analysis is summarized as follows:

Entrepreneurial expectation is the key factor affecting serial entrepreneurial intention, which directly affects serial entrepreneurial intention. The research shows that entrepreneurs' psychological capital has an indirect impact on serial entrepreneurial intention, and entrepreneurial expectation is the mediator. Entrepreneur can cultivate entrepreneurs' psychological capital such as self-confidence and entrepreneurial self-efficacy through a variety of social support methods; meanwhile, entrepreneurial learning from failure helps to promote entrepreneurs' ability of opportunity identification and evaluation, which affects entrepreneurial expectations. Therefore, entrepreneurs should be encouraged to learn from failure and improve their human capital.

Opportunity identification and evaluation play an important role in the formation of serial entrepreneurial intention. Entrepreneurial cognitive schema and behavioral addiction tendency have a direct impact on opportunity identification and evaluation. At different career stages, the entrepreneurial cognitive schema shows differentiated characteristics. Entrepreneurs can enrich entrepreneurial cognitive schema through continuous learning over time. Behavioral addiction tendency has been found as an important driving factor, which is mainly affected by demographic factors.

In addition, this study also shows that demographic factors, financial conditions, environment conditions, and entrepreneurship experience are the basic conditions affecting serial entrepreneurial intention, which indirectly affect serial entrepreneurial intention, and emotional perception and motivation factors are the mediators. To be specific, entrepreneurial experience and financial conditions directly affect entrepreneurs' emotional perception. Emotional regulation is closely related to how to learn after entrepreneurial failure. The environment conditions and financial conditions will directly affect the motivation of entrepreneurs and indirectly affect the failure attribution.

Case study

This research chooses a case of serial entrepreneur to study the factors affecting serial entrepreneurship intention in order to test the model we have obtained above. There are three main reasons for choosing this case. First, the entrepreneur in

TABLE 6 Interpretive structure model analysis of 16 factors.

Level	R(Fi)	C(Fi)	$R(F_i) \cap C(F_j)$
1	1, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15	1, 2, 4, 5	1, 4, 5
	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16	2	2
	3, 6, 7, 8, 9, 11, 13, 14, 15, 16	2, 3	3
	1, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15	1, 2, 4, 5	1, 4, 5
	1, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15	1, 2, 4, 5	1, 4, 5
	6	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	**6**
	6, 7, 8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7	7
	6, 8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	6, 8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	6, 8, 9, 10, 11, 13, 14, 15	10	10
	6, 8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	6, 8, 9, 11, 12, 13, 14, 15, 16	12	12
	6, 8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	6, 14	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	14
	6, 8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	6, 8, 9, 11, 13, 14, 15, 16	2, 3, 12, 16	16
2	1, 4, 5, 7, 8, 9, 11, 13, 14, 15	1, 2, 4, 5	1, 4, 5
	1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15, 16	2	2
	3, 7, 8, 9, 11, 13, 14, 15, 16	2, 3	3
	1, 4, 5, 7, 8, 9, 11, 13, 14, 15	1, 2, 4, 5	1, 4, 5
	1, 4, 5, 7, 8, 9, 11, 13, 14, 15	1, 2, 4, 5	1, 4, 5
	7, 8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7	7
	8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	8, 9, 10, 11, 13, 14, 15	10	10
	8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	8, 9, 11, 12, 13, 14, 15, 16	12	12
	8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	14	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	**14**
	8, 9, 11, 13, 14, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	8, 9, 11, 13, 15
	8, 9, 11, 13, 14, 15, 16	2, 3, 12, 16	16
3	1, 4, 5, 7, 8, 9, 11, 13, 15	1, 2, 4, 5	1, 4, 5
	1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 15, 16	2	2
	3, 7, 8, 9, 11, 13, 15, 16	2, 3	3
	1, 4, 5, 7, 8, 9, 11, 13, 15	1, 2, 4, 5	1, 4, 5
	1, 4, 5, 7, 8, 9, 11, 13, 15	1, 2, 4, 5	1, 4, 5
	7, 8, 9, 11, 13, 15	1, 2, 3, 4, 5, 7	7
	8, 9, 11, 13, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	**8, 9, 11, 13, 15**
	8, 9, 11, 13, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	**8, 9, 11, 13, 15**
	8, 9, 10, 11, 13, 15	10	10
	8, 9, 11, 13, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	**8, 9, 11, 13, 15**
	8, 9, 11, 12, 13, 15, 16	12	12
	8, 9, 11, 13, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	**8, 9, 11, 13, 15**
	8, 9, 11, 13, 15	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16	**8, 9, 11, 13, 15**
	8, 9, 11, 13, 15, 16	2, 3, 12, 16	16
4	1, 4, 5, 7	1, 2, 4, 5	1, 4, 5
	1, 2, 3, 4, 5, 7, 16	2	2
	3, 7, 16	2, 3	3
	1, 4, 5, 7	1, 2, 4, 5	1, 4, 5

(Continued)

10.3389/fpsyg.2022.992141

TABLE 6 (Continued)

Level	R(Fi)	C(Fi)	$R(F_i) \cap C(F_j)$
	1, 4, 5, 7	1, 2, 4, 5	1, 4, 5
	7	1, 2, 3, 4, 5, 7	**7**
	10	10	**10**
	12, 16	12	12
	16	2, 3, 12, 16	**16**
5	1, 4, 5	1, 2, 4, 5	**1, 4, 5**
	1, 2, 3, 4, 5	2	2
	3	2, 3	**3**
	1, 4, 5	1, 2, 4, 5	**1, 4, 5**
	1, 4, 5	1, 2, 4, 5	**1, 4, 5**
	12	12	**12**
6	2	2	**2**

Bold values represent the factors of each level in the interpretative structural model.

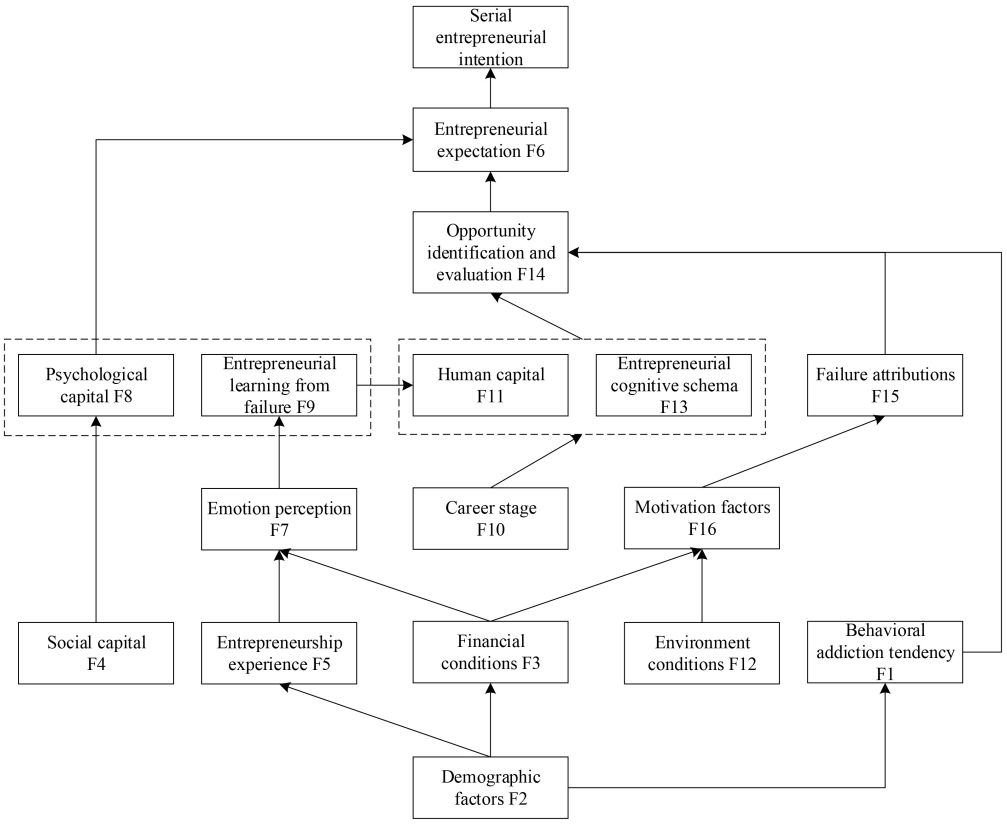

FIGURE 1
Interpretive structure model.

this case has the intention to start a new business after the success or failure. Second, he is a typical serial entrepreneur with many entrepreneurial experiences. Third, it is convenient to obtain data about this case. The entrepreneur in this case is a typical representative of Chinese internet entrepreneurs, which easily provides a large number of data. Therefore, this case is representative for studying the factors affecting serial entrepreneurship intention. Based on the principle of true and valid data selection and sources, we collected news interviews, published books, company materials, and publicly published academic research results related to serial entrepreneurial behavior to ensure the effectiveness of case analysis.

The entrepreneur in the case, represented as *A*, has started businesses for six times, all in the internet industry. After many entrepreneurial failures, the internet service company he founded has been listed, which ranks third in Internet industry of China with a market value of more than 140 billion dollars now. Entrepreneurial process can be roughly divided into three stages (Wang, 2020).

In the first stage, *A* and his partners formed an entrepreneurial team to start their business in China. They established three social networking sites in succession because of the belief that social networking sites (opportunity identification and evaluation) were a valuable and promising opportunity (entrepreneurial expectation). Although they focused on the internet industry, which they were familiar with and identified valuable opportunities, all the three startups failed. *A* noted that the previous two startups failed because of the emphasis on products and the neglect of promotion (entrepreneurial learning from failure), so they paid more attention to promotion (human capital) in the third startup. From this, we can see that learning from failure promote human capital, which laid the foundation for the next startup. However, the financial return of the third social networking site was not satisfactory (entrepreneurial expectation), resulting in being sold. This failure was so hard for him that he chose employment for a while. As mentioned above, *A* started businesses for three times in succession because of the good entrepreneurial expectations for the identified opportunities and voluntarily sold the third social networking sites because of the bad expectation for financial return, which interpreted that entrepreneurial expectation is the key factor affecting serial entrepreneurial intention, and that identification and evaluation of opportunity indirectly affect serial entrepreneurship intention through entrepreneurship expectation.

In the second stage, *A* chose to start a new business again after 1 year's employment. *A* looked for opportunities which were promising and focused on the blog after much thought (opportunity identification and evaluation). He built two blog websites in succession in this stage, but he still failed for various reasons. The first blog website was going well at first, but it had to be shut down because of unexpected accident that a large number of sensitive remarks caused by irregular management appeared in blogs. However, the entrepreneurial failure did not make *A* lose his confidence but showed his maturity to the entrepreneurial team which strengthened the confidence of the entrepreneurial team (psychological capital), and built the second blog website at last. From this, we can see that psychological capital affects serial entrepreneurial intention. As mentioned above, *A* started businesses five times and focused on an Internet-related entrepreneurship program in the first and second stages, which reflected that he was very persistent in starting businesses and actively looked for entrepreneurial opportunities in the Internet industry (opportunity identification and evaluation). As *A* said in the interview: "I don't regard entrepreneurship itself as a special thing. It's just my lifestyle and I have an extreme adherence to entrepreneurship" (behavioral addiction tendency). So behavioral addiction tendency affects serial entrepreneurial intention through opportunity identification and evaluation.

In the third stage, *A* constantly studied websites and products and finally found an entrepreneurial opportunity, that is a business website (opportunity identification and evaluation). He determined the path to build a business website based on the experience of previous failures and development mode of internet marketing he summarized (entrepreneurial cognitive schema). He established a group-buying website and achieved great performance. As mentioned above, entrepreneurial cognitive schema affects serial entrepreneurial intention through opportunity identification and evaluation. *China Youth Daily* once published *A*'s words: The entrepreneurs failed because of immature opportunity which was incompatible with the environment 10 years ago. However, it does not mean that this thing should not be done, and it may be successful to do it at another time (entrepreneurial environment), showing that the entrepreneurial environment is a basic factor affecting serial entrepreneurship intention.

To sum up, the discussion of the case is in line with the interpretive structure model constructed in this paper, the key factors which are affecting serial entrepreneurship intention show hierarchical characteristics.

Conclusion

This study sorted out 16 key factors affecting serial entrepreneurship intention. According to the method of interpretive structure model of system engineering, this study constructs a hierarchical model of the factors affecting serial entrepreneurial intention and tests it through case study, which defines the key factors, basic conditions, and paths affecting serial entrepreneurial.

The results of this study show that entrepreneurial expectation is the key factor affecting serial entrepreneurial intention, which directly affects serial entrepreneurial intention. Entrepreneurs may be forced to quit the enterprise due to insolvency, or they may take the initiative to quit the existing enterprise because the performance of the enterprise fails to meet the expectations of entrepreneurs (Westhead et al., 2005; Ucbasaran et al., 2010), or because they find new business opportunities (Hessels et al., 2011). When entrepreneurs' distress exits, they can improve their ability to identify and evaluate opportunities through entrepreneurial recovery and learning from failure, which will help them to form reasonable entrepreneurial expectations. While they choose to exit, they may have serial entrepreneurial intention due to their positive expectation of new business opportunities. Moreover, the exit mode will also affect entrepreneurial expectation

through the entrepreneur's psychological capital. Different from previous studies that focus on the distress exits affecting serial entrepreneurial intention, this study believes that the formation of serial entrepreneurial intention of entrepreneurs who take the initiative to quit is also a topic that needs to be paid attention to. In addition, this study proposes that social capital has a significant impact on entrepreneurs' psychological capital. The risk and pressure of entrepreneurship are alleviated by social support, which helps to stimulate entrepreneurial resilience of entrepreneurs (Zhang and Li, 2020) and improve their psychological resilience, finally affecting serial entrepreneurial intention.

This study also shows that identification and evaluation of opportunity play an important role in the formation of serial entrepreneurial intention. Entrepreneurial cognitive schema and behavioral addiction tendency have a direct effect on identification and evaluation of opportunity, which in turn affects serial entrepreneurial intention. Vaillant and Lafuente (2019) proposed that the learning process generated in the past entrepreneurial experience may affect entrepreneurial cognitive schema, which is very important for an entrepreneur to reenter into new entrepreneurship and become a serial entrepreneur. The findings of this study not only further explain the path of entrepreneurial experience affecting serial entrepreneurial intention but also indicate that there is a cognitive mechanism behind opportunity identification. In addition, entrepreneurs who have the behavioral addiction tendency will think compulsively and look for innovation and opportunities continuously (Spivack et al., 2014), to become serial entrepreneurs. Furthermore, demographic factors directly affect behavioral addiction tendency, which indicates that behavioral addiction tendency is related to physiological factors to a certain extent.

In addition, demographic factors, financial conditions, environmental conditions, and entrepreneurial experience are the basic conditions that affect serial entrepreneurial intention, which work indirectly mainly through emotional perception and motivation factors. The findings in this study help us better understand the persistence of entrepreneurial spirit and analyze the formation process of serial entrepreneurial intention.

Discussion

Implications

This study has three main aspects in theoretical contribution. Firstly, the ISM model clearly interprets the internal relationship and hierarchical structure of the factors affecting serial entrepreneurial intention and makes contributions to understanding serial entrepreneurship intention in depth. Although the existing literature has integrated the factors affecting serial entrepreneurship intention (Tipu, 2020), which has not constructed the internal relationship and hierarchical structure of the influencing factors. As Zhao et al. (2014) note that the studies on the factors affecting serial entrepreneurship intention still lack depth, and what role the factors play and how the factors exert their influence need to be further analyzed. Based on the existing literature on the factors affecting serial entrepreneurship intention, this study constructs an ISM model showing a multilevel hierarchical structure with six levels, which defines the key factors, basic conditions, and paths affecting serial entrepreneurial intention. Secondly, this study contributes to the theoretical development of serial entrepreneurship research. The results of this study show that entrepreneurial expectation is the key factor affecting serial entrepreneurial intention, which directly affects the serial entrepreneurial intention, and that identification and evaluation of opportunity indirectly affect serial entrepreneurship intention through entrepreneurship expectation. As Parker (2014) notes, the key factor that decides why some people become serial entrepreneurs while others remain novice entrepreneurs is the identification and evaluation of opportunity, and identification and evaluation of opportunity play an important role in the formation of serial entrepreneurial intention. This is proved by this study. Furthermore, this study puts forward influencing mechanism of identification and evaluation of opportunity, which further supplements the conclusion and defines the key role played by entrepreneurial expectation. In addition, from results, we also suggest that entrepreneurial cognitive schema and behavioral addiction tendency have a direct effect on identification and evaluation of opportunity, which provides new perspectives and useful clues for opportunity cognition mechanism. Existing studies have identified the unique regular pattern of identification and evaluation of opportunities of serial entrepreneurs, but have not yet explored the cognitive mechanism behind the regular pattern (Yu et al., 2020). Prototype model is one of the recognition modes for entrepreneurs to find opportunities, the higher the matching degree between things and prototypes, the more likely they are to find entrepreneurial opportunities (Shane, 2003). Entrepreneurial cognitive schema affects the prototypes and cognitive modes of opportunity identification, which is a useful clue. At the same time, behavioral addiction tendency as a special pathological feature is closely related to the individual nervous system and can affect individual cognition (Moore et al., 2021), which provides a new perspective for the study of the mechanism of opportunity cognition. Moreover, entrepreneurs with behavioral addiction tendency will have such special behaviors as compulsive thinking, conceit, and neglect of family and friends (Spivack et al., 2014), which reflects the dark side of entrepreneurial activities. This study finds that demographic factors directly affect behavioral addiction tendency, which provides useful clues for the study of the dark side of entrepreneurial activities. Thirdly, the ISM model shows multiple influencing paths of the factors affecting serial

entrepreneurial intention, which provides a framework for the research of serial entrepreneurship intention. Although some influencing paths have been confirmed by empirical research (Parker, 2014; Wang et al., 2018; Zhang and Wang, 2020), some paths still need to be explored. It is interesting to note that in **Figure 1**, individual factors and environmental factors are below the third level, and the entrepreneurial factors are above the fourth level except for entrepreneurial experience (F5). Based on the role and the descriptive definition of entrepreneurial experience in ISM model, it is found that more attention is paid to the entrepreneurial failure context in existing studies and the research on the mode of distress exits exit is more extensive, while the research on the mode of taking the initiative to exit is lacking, which may be one of the reasons why the entrepreneurial factors are above the fourth level except for entrepreneurial experience (F5).

The conclusion of this study provides enlightenment for entrepreneurs and entrepreneurial management organizations in managing entrepreneurial activities. Firstly, entrepreneurial expectation is the direct key factor affecting serial entrepreneurship intention. Psychological capital affects entrepreneurial expectation, which in turn affects serial entrepreneurial intention. Entrepreneurial self-efficacy affects the willingness to participate in entrepreneurial activities in the future (Hsu et al., 2017b). Maintaining a high degree of self-efficacy in entrepreneurial activities can enhance serial entrepreneurship intention and make entrepreneurs more persistent. Although self-confidence helps to recover from entrepreneurial failure, entrepreneurs' overconfidence in environmental cognition will reduce entrepreneurial performance (Li and Cheng, 2018), so entrepreneurs should maintain moderate and reasonable self-confidence and high entrepreneurial self-efficacy. Secondly, identification and evaluation of opportunity have a direct effect on entrepreneurial expectation, which in turn affects serial entrepreneurial intention. So entrepreneurs should effectively improve their ability to identify and evaluate opportunities. This study also proposes two strategies to improve the ability of identification and evaluation of opportunity. One, human capital (e.g., rich entrepreneurial experience) helps entrepreneurs to identify entrepreneurial opportunities and strengthen their ability to evaluate and develop entrepreneurial opportunities (Ucbasaran et al., 2003, 2008). Entrepreneurs should effectively learn and absorb entrepreneurial failure experience, especially in the context of entrepreneurial failure. Two, entrepreneurs enrich their entrepreneurial cognitive schema through continuous learning (Vaillant and Lafuente, 2019), providing an effective cognitive mechanism for the identification and evaluation of opportunities. Thirdly, financial conditions and entrepreneurial environment are the basic conditions affecting serial entrepreneurship intention. Therefore, government departments should provide entrepreneurial education such as failure education and emotional education to guarantee the entrepreneurs' learning. At the same time, the government needs to provide strong support in entrepreneurship policy, both financially and psychologically, to create a good economic and social environment for entrepreneurial activities.

Limitation and future research

This study provides some new ideas and directions for future research, but there are still some limitations. Firstly, this study uses the method of interpretive structure model to propose a hierarchical structure model of the factors affecting serial entrepreneurial intention. The method is one method of systems engineering that has been partly applied in the field of entrepreneurship (Muruganantham et al., 2018; Wei et al., 2019), but the applicability of it still needs to be further studied. Secondly, the hierarchical model proposed in this study lacks strong empirical support. Future research can carry out empirical exploration of relevant approaches to provide empirical support for the relationship between factors. Finally, the single case study in this paper seems not enough to fully explain the interpretive structure model of factors affecting serial entrepreneurial intention. As Cardon et al. (2011) note approaches of sense-making under different cultural backgrounds may have different effects on individual intentions and behaviors. Future research can enrich the model using more cases from different cultural backgrounds.

In addition, the hierarchical model proposed in this study provides a new research approach and direction for future research on serial entrepreneurial intention. First of all, we need to pay more attention to the research on exit modes, especially the mode of taking the initiative to exit. As indicated earlier, entrepreneurs may actively quit entrepreneurship or passively quit entrepreneurship, but less attention is paid to the mode of taking the initiative to exit in existing studies (Yu et al., 2020). Along this line, we need to further explore the influencing mechanism of different exit modes on serial entrepreneurship intention, especially the impact of the mode of taking the initiative to exit on subsequent entrepreneurial decisions. Secondly, we need to continue to explore the cognitive mechanism behind entrepreneurs' opportunity identification. Entrepreneurs use the cognitive structure of identifying opportunities to compare new ideas with opportunities, to identify opportunities (Santos et al., 2015). Entrepreneurial cognitive schema is an "action-based knowledge structure" used by entrepreneurs based on highly developed and orderly knowledge (Mitchell et al., 2000), so entrepreneurs identify opportunities that match the prototypes in entrepreneurial cognitive schema. However, this study shows that serial entrepreneurs enrich their entrepreneurial cognitive schema through continuous learning, which can update the cognitive structure used to identify opportunities. Whether entrepreneurs only recognize the opportunities that match the

prototypes or update their entrepreneurial cognitive schema (prototype model) to identify opportunities still needs further exploration. At the same time, the pathological perspective is a new perspective for the study of cognitive mechanism behind entrepreneurs' opportunity identification. As Moore et al. (2021) note the pathological characteristics of entrepreneurs affect their cognitive structure, so we need to continue to explore the impact of other types of neurological or pathological characteristics on opportunity recognition, such as insomnia and obsessive-compulsive personality disorder. Thirdly, we need to further explore the dark side of entrepreneurship. Emotional reaction, performance feedback, and entrepreneur–enterprise connection in entrepreneurial activities will all become reinforcing factors of behavioral addiction to entrepreneurship (Yu et al., 2021). Along this line, future research can continue to explore reinforcing factors of behavioral addictive tendency, such as physiological factors and other dark sides of entrepreneurial activities.

Data availability statement

The original contributions presented in this study are included in the article/supplementary material, and the datasets generated for this study are available on request to the corresponding author.

Author contributions

XB was responsible for drafting the manuscript, as well as the acquisition, analysis and interpretation of data. DC and YC participated in the data analysis and revising of the manuscript. All authors have read and approved the final manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The role of individual variables as antecedents of entrepreneurship processes: Emotional intelligence and self-efficacy

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Currently, entrepreneurship is a priority for economic, social, and technological growth. Therefore, the interest in understanding entrepreneurship processes has increased significantly. Individual variables play a fundamental role, and academic research has pointed out the influence of emotional intelligence in entrepreneurial processes; however, its relationship with other interpersonal processes and individual variables, such as personality and self-efficacy, has not been extensively studied. The aim of this research was to analyze the relationship among emotional intelligence, self-efficacy, and entrepreneurial intention, controlling for the effects of personality, gender, and age. Multiple hierarchical regression analyses were applied through a questionnaire survey of 1,593 college students to test the relationship between the constructs in the model. The results show that the personality traits are associated with entrepreneurial self-efficacy, emotional intelligence positively influences entrepreneurial intention, and self-efficacy mediates the relationship between emotional intelligence and entrepreneurial intention. Practical implications for training programs are examined, and future lines of research were discussed.

KEYWORDS

entrepreneurial intention, emotional intelligence, self-efficacy, personality, individual differences

Introduction

Entrepreneurship is one of the main goals to support society's progress and to improve citizens' employability, innovation, and economic growth. According to Leutner et al. (2014), entrepreneurship can be described as behaviors that create value by taking advantage of opportunities in an innovative and new way. Not only entrepreneurship is the creation of companies, but entrepreneurial behavior also implies discovering ideas and opportunities and carrying them out (Shane and Venkataraman, 2000).

The literature on entrepreneurship shows that it is a multidimensional behavior, a process rather than an isolated event, which results from planned activities, random events, individual variables, and social norms (Leyden and Link, 2015; Dimov, 2020). It is these

complex interactions that lead more and more academics to talk about entrepreneurship processes (Brixy et al., 2012; McMullen and Dimov, 2013).

The interest in fostering entrepreneurial intention to promote innovation, economic growth and combat unemployment has led to extensive efforts to identify potential entrepreneurs, develop training for entrepreneurship, and identify key aspects in entrepreneurial processes (Sánchez, 2013). University students are particularly important in the research on entrepreneurial intention (Krueger et al., 2000; Barba-Sánchez et al., 2022). Research shows that entrepreneurs and students with high entrepreneurial intention have a similar psychological profile, which is characterized by high scores on extraversion, conscientiousness, openness, emotional intelligence, self-confidence, and ambiguity tolerance and low scores on agreeableness and neuroticism. This profile can predict entrepreneurial intention with a significant level of accuracy (López-Núñez et al., 2020).

Since behavior is based on individual differences, it can be assumed that these differences influence entrepreneurial intentions and behavior, regardless of whether the person is an employee, a self-employed worker, or a student (Ahmetoglu et al., 2011).

Entrepreneurial intention is the strongest predictor of entrepreneurial behavior. So that exploring the mechanisms that underlie the effect of individual variables on entrepreneurial intention will contribute to better understanding of the entrepreneurship process. Several scholars have examined widely the association between personality traits and entrepreneurial intention (Fellnhofer, 2018; Hu et al., 2018). Other studies have focused on the effect of emotional intelligence (EI) on entrepreneurial intention (Ingram et al., 2019) although there are fewer studies that have analyzed the relationship between EI and individual differences in entrepreneurship. While other studies, based on social cognitive theory, have provided empirical evidence that entrepreneurial self-efficacy (ESE) is a key cognitive predictor of entrepreneurial intention (Hu and Ye, 2017). Despite that, few studies have explored the role of entrepreneurial self-efficacy related to EI and entrepreneurial intention (Mortan et al., 2014; Chien-Chi et al., 2020).

Identifying the individual factors that predict entrepreneurial intention has great theoretical and practical significance. On the one hand, it will provide theoretical explanation for the relationship among EI, ESE, and entrepreneurial intention for a better understanding of the individual variables as antecedents of entrepreneurship process (Dimov, 2020; Matricano, 2020). On the other hand, the results may help to identify potential entrepreneurs and may be used to design more effective training strategies to develop the skills and competencies that both novice and emerging entrepreneurs need to face the challenges of their new projects and achieve success. (Cope, 2011) provides suggestions for the long-term development of entrepreneurship education.

This study was designed from the revision of the Theory of Planned Behavior (TPB; Ajzen, 2011), the social cognitive theory (SCT; Bandura, 2001), and the basic intention-based progress model (Krueger and Brazeal, 1994; Wu et al., 2018). According to TPB, entrepreneurial intention is influenced by personal attitudes (positive or negative evaluation about the intended behavior), subjective norms (the perceived social support to fulfill the intended behavior), and perceived behavioral control, which refers to an individual's perception of being able to perform the intended behavior. It is important to note that perceived behavioral control refers not only to believing that one has the necessary skills for the desired behavior, but also to the individual's perception of what can be done with those skills. TPB posits that the most important factor influencing behavior is intention.

SCT has revealed that entrepreneurial intention and success are greatly influenced by entrepreneurial self-efficacy (Buttner, 2001). Additionally, the literature shows the importance of self-efficacy and emotional intelligence (EI) on intended behavior (McLaughlin, 2019). However, research on EI and entrepreneurial self-efficacy (ESE) is scarce and does not offer clear conclusions in the context of entrepreneurship (Miao et al., 2017a,b; Ingram et al., 2019).

The basic intention-based progress model proposes that the emergence of the entrepreneurial intention process is highly sensitive to initial conditions. Individuals who adopt certain behavioral goals are influenced by external factors and planned behavioral attitudes. External factors include skills, knowledge, and personality traits, among others.

Based on the three aforementioned models, this study tries to deepen the knowledge about the influence of individual variables on entrepreneurial intention. Specifically, the goal of this study was to analyze the relationship among emotional intelligence (EI), entrepreneurial self-efficacy (ESE), and entrepreneurial intention, controlling the effects of individual variables (personality, gender, and age).

This paper is structured as follows: After this introduction, the section "Literature review and research hypotheses" outlines the hypothesized relationships between entrepreneurial intention, emotional intelligences, personality, and entrepreneurial self-efficacy; the "Material and methods" section describes Participants, Measures, Procedures, and Data analyses. "Results" section presents the results of the analyses carried out to examine the relationship between the variables studied, and finally, in the section "Discussion and implications" the limitations and future research, conclusion, and practical implications are presented.

Literature review and research hypotheses

Entrepreneurial intention

In order to understand the antecedents of individuals' behaviors, different models of entrepreneurial intention have been proposed and tested with samples of university students in the years previous to come into the labor market. Social-cognitive theory (Bandura, 1986) and the theory of planned behavior

(Ajzen, 2011) are the most important in this context. Intention has been defined as the "indications of a person's readiness to perform a behavior." Ajzen (2011, p. 1122). In the entrepreneurial context, Bird describes entrepreneurial intention as "a process, state, or act of conscious willing in the present to make some experience become true, realized, manifested, or created in the future…Thus, intentions can be to do, to be or to have" (Bird, 2015, p.143). For this author, it is the state of mind that directs actions toward entrepreneurial behavior. Bird highlights the importance of psychological variables and the impact of people with higher entrepreneurial intention in the development of organizations. Several authors view entrepreneurial intention as the first step and the necessary precursor to entrepreneurial behavior (Kickul et al., 2009; Liñán and Chen, 2009; McLaughlin, 2019).

In psychology, the study of entrepreneurship has mainly focused on examining which individual variables are able to predict entrepreneurial intentions and determining which traits distinguish entrepreneurs from non-entrepreneurs. These studies explore factors affecting motivation to become an entrepreneur, including personal attributes, gender, age, and education (Baron, 2007) as well as the individual's attitude toward change, competition, monetary rewards, achievement, and autonomy (Delmar and Davidsson, 2000). Relationships between entrepreneurial intention and psychological variables like personality traits (Zhao et al., 2010; Obschonka and Stuetzer, 2017) entrepreneurial self-efficacy (McGee et al., 2009; Murugesan and Jayavelu, 2017), or emotional intelligence (Zampetakis et al., 2009; Ingram et al., 2019) had been also studied.

Personality traits

There is a substantial body of literature exploring what personality traits influence entrepreneurial intention, mostly under the Big Five personality model (Chao-Tung et al., 2015). In a systematic review on entrepreneurial intentions, Liñán and Fayolle (2015) found that nearly a half of the papers about individual variables and entrepreneurial intention focus on personality.

In the review by Omorede et al. (2015), 39% of the research was designed to study personality in this field, focusing on both general (Zhao et al., 2010; Brandstätter, 2011), and specific personality traits (Rauch and Frese, 2007a,b; Muñiz et al., 2014).

Research reveals that higher scores in extroversion, conscientiousness, and openness and lower in agreeableness and neuroticism are positively associated with entrepreneurial intention (Zhao et al., 2010; López-Núñez et al., 2020).

Extraversion describes a person who is active, is energetic, and enjoys participating in groups. Extraversion is a reliable predictor of good interpersonal relationships and constructive social interactions (Rothmann and Coetzer, 2003). The study by Lee and Tsang (2001) with novel entrepreneurs found that extraversion led to set up communication networks that facilitated their business progress.

Openness to experience refers to a sense of curiosity, open-mindedness, and acceptance of novel experiences (McCrae and Costa, 2003) and is considered an important factor in entrepreneurs, because it is involved in recognizing entrepreneurial opportunities (Zhao and Seibert, 2006; Antoncic et al., 2015). People higher in openness are someone being free to new ideas and ready and receptive to perceive an opportunity, essential to start an entrepreneurial process (Baron, 2007).

Conscientiousness is manifested in goal orientation (the quality of being hardworking and persistent), dependability (the quality of being responsible and careful), and orderliness (being organized and planned; Rothmann and Coetzer, 2003). Conscientious people tend to be efficient, careful, organized, and practical. Studies on entrepreneurship find that conscientiousness is positively related to the long-term survival of a business and to motivation to achieve goals (Singh and deNoble, 2003; Chao-Tung et al., 2015).

Despite the positive aspects of agreeableness, some authors have pointed out its dark side in relation to entrepreneurs (Antoncic et al., 2015). Since in the business environment, relationships can often be adversarial, altruistic behavior may not be a beneficial trait. In this sense, several studies have found that entrepreneurs are lower in agreeableness than non-entrepreneurs (Zhao and Seibert, 2006; Chao-Tung et al., 2015).

Studies suggest that entrepreneurship is positively related to low neuroticism and high emotional stability scores. High levels of anxiety and negative moods, such as anger, are likely to interfere with the ability to make good decisions. People with low emotional stability scores are less likely to deal with problems and stress through positive thinking and direct action. People with high levels of emotional stability carry themselves calmly and confidently and focus on the tasks at hand, even under stress (Zhao et al., 2010).

Although it seems clear that personality is an important antecedent of entrepreneurial intention and entrepreneurship, it is not enough to explain the role of individual variables in the entrepreneurial process. In fact, some authors have indicated that other variables, such as emotional intelligence, can also be significant in predicting entrepreneurial intention and behavior (Andrei et al., 2016; Miao et al., 2018).

The below additional hypotheses are postulated based on these arguments:

> *H1*: Personality traits are associated with entrepreneurial self-efficacy.
>
> *H1a*: Neuroticism and agreeableness are negatively related to entrepreneurial self-efficacy.
>
> *H1b*: Extroversion, openness, and conscientiousness show a positive relationship with entrepreneurial self-efficacy.

Emotional intelligence

The literature on entrepreneurship also highlights the role that emotions play in recognizing opportunities (Foo, 2011; Wincent and Örtqvist, 2011). Emotional intelligence (EI) is the ability to recognize, understand, and handle the emotions (Mayer and Salovey, 1997).

Being an entrepreneur involves making decisions in uncertain and high-risk circumstances where emotions surface due to demands, time pressure, and stress. In addition, to achieve their goals, the entrepreneur is required to be able to properly regulate emotions in social interactions. Therefore, entrepreneurship is a highly emotional work context, which requires the regulation of emotions to display them appropriately to a variety of stakeholders. Research on EI is relevant in psychology, both in clinical and applied psychology (Petrides et al., 2016). In general, people with high EI show a higher stress tolerance and better use their emotional regulation skills. In addition, self-perceived emotions tend to have greater creativity and proactivity, which influences entrepreneurial behavior (Ingram et al., 2019). EI is related to successful decision-making and greater satisfaction with life (Bastian et al., 2005). People with higher EI scores are more imaginative, are proactive, and show more entrepreneurial intention than those with lower scores (Cross and Travaglione, 2003). People with high emotional intelligence show a higher stress tolerance and better use their emotional regulation skills.

Zampetakis et al. (2009) argue that EI affects entrepreneurial behavior in two ways: The first is through the self-evaluation of emotional efficacy (workers with high EI may show high tolerance to stress); and the second refers to the fact that individuals with high EI tend to have higher affectivity, related to proactivity and creativity, thus facilitating entrepreneurial behavior. They studied the relationship between entrepreneurial behavior and emotional intelligence and found that there is a direct effect of EI on entrepreneurial behavior.

In the work context, research has focused mainly on the role of EI in performance, engagement, job effectiveness, health, and job satisfaction (Miao et al., 2016, 2017a,b), and less attention has been given to its role as an antecedent of entrepreneurial intentions and its relationship with other individual variables, such as self-efficacy (McLaughlin, 2019). Entrepreneurial activity requires establishing interpersonal relationships, which involves building trust, establishing networks, and managing adversity. All this must be done in an environment of high uncertainty, which strengthens the role of emotion management.

The literature highlights the key role of emotional intelligence in entrepreneurial intention and its relationship with other individual variables in both student and entrepreneur samples (Ahmetoglu et al., 2011; Miao et al., 2018). In a study with college students, Mortan et al. (2014) found that emotional intelligence positively affects self-efficacy and that this mediates the relationship between emotional intelligence and entrepreneurial intention. In another study with a sample of 943 students enrolled in management courses, Ingram et al. (2019) demonstrated that interpersonal skills, which involve recognizing and managing emotions, have a positive effect on entrepreneurship.

Therefore, this study postulates the below hypothesis:

> *H2*: Emotional intelligence dimensions are positively associated with entrepreneurial self-efficacy.

Self-efficacy

Self-efficacy is defined as "…belief in one's capabilities to mobilize the motivations, cognitive resources, and courses of action needed to meet given situational demands…" (Wood and Bandura, 1989, p. 364). This motivational construct has been applied to the field of entrepreneurship, giving rise to the concept of entrepreneurial self-efficacy (ESE).

In this context, ESE refers to the confidence that an individual has of his or her capacity to accomplish the entrepreneurial process (Chen et al., 1998). People with high ESE show confidence in their own abilities to achieve their goals in entrepreneurial areas, set challenging goals, show perseverance, and recover quickly from failure. ESE is a relevant antecedent of venture performance (Miao et al., 2017a,b).

Self-efficacy beliefs affect a person's expectations, goals, and decisions. It can be improved through experience, so learning plays an important role in its development (Bandura et al., 2001). People with high levels of self-efficacy make more effort to comply with their commitments and associate failure with internal factors, rather than external factors (Hechavarria et al., 2012).

Research focused on the development of ESE considers variables, such as experience, vicarious learning, and social persuasion using social cognitive theory (Bandura, 1977) as a model. Research shows a relationship between ESE and entrepreneurial intention (Barbosa et al., 2007; Kickul et al., 2009). With a sample of college students, Hu and Ye (2017) provided empirical evidence that ESE is a key cognitive predictor of entrepreneurial intention.

The knowledge base and capabilities that can be developed through experience or higher education programs are considered to have a positive effect on an individual's motivation and self-efficacy for entrepreneurship. Newman et al. (2019) showed that entrepreneurial intention is the most widely studied outcome of ESE. In the field of higher education, the positive relationship between ESE and entrepreneurial intention has also been demonstrated (Piperopoulos and Dimov, 2015; Hu and Ye, 2017). These results can be used to help ensure that entrepreneurial education is more effective in educational programs, professional training, and vocational guidance.

The results on the relationship of the ESE with entrepreneurship have increased interest in knowing its mediating influence on entrepreneurial intention. Kumar and Shukla (2019) explored the role of ESE as mediating the effect of proactivity and creativity on entrepreneurial intention in a

sample of 484 management students. They found that ESE was the strongest predictor of entrepreneurial intention. In another study, Prabhu et al. (2012) analyzed the role of ESE in mediating the influence of personality on entrepreneurship and found that ESE had a robust effect on the correlation between personality and entrepreneurship.

ESE has been emphasized as a key antecedent of entrepreneurial intentions. Individuals are more commonly inclined to choose situations in which they anticipate more personal control and to avoid situations in which they anticipate less personal control. Entrepreneurial self-efficacy progresses over time and is influenced by internal and external factors, such as education, economic context, and psychological variables (Miao et al., 2017a,b).

Despite the research that demonstrates the important role played by EI and ESS as antecedents of entrepreneurial intention (McLaughlin, 2019), few studies have addressed the relationship between both variables in the entrepreneurial process, and these have focused on vocational college students (Newman et al., 2019; Wen et al., 2020).

The following hypotheses are proposed to examine the possible effect of ESS:

> *H3*: Entrepreneurial self-efficacy is positively associated with entrepreneurial intention.

> *H4*: Entrepreneurial self-efficacy mediates the relationship between emotional intelligence and entrepreneurial intention.

Materials and methods

Participants

A non-experimental, cross-sectional design was used in this research. Non-probabilistic sampling was used. The participants were 1,593 college students, aged between 17 and 69 ($M = 21.0$, $SD = 3.80$). Data were provided from several disciplines, such as humanities (4.7%), social sciences (40.1%), experimental sciences (6.0%), and health sciences (49.2%). Women made up a majority (68.2%) of the sample. Most participants (78.0%) were studying, and 22.0% were both studying and working.

Measures

Entrepreneurial intention

It was evaluated through a Likert-type scale with six items (Liñán and Chen, 2009) that assess behavioral intention in one factor. The items ask about the degree of agreement in a range of seven points. The items on this scale are like "My professional goal is to become an entrepreneur" or "I am determined to create a firm in the future." The higher the score on the scale, the higher the level of entrepreneurial intention. The reliability (internal consistency) of this scale with our sample was high (Cronbach's alpha = 0.93).

Entrepreneurial self-efficacy

The Perceived Behavioral Control Scale by Liñán and Chen (2009) was used to assess ESE. It includes six items that ask for the degree of agreement in a seven-point Likert scale. Items are like "To start a firm and keep it working would be easy for me" or "If I tried to start a firm, I would have a high probability of succeeding." In this study, Cronbach's alpha was 0.90.

Emotional intelligence

It was evaluated with the Spanish Modified Version of the Trait Meta-Mood (TMMS-24; Fernández-Berrocal et al., 2004). This instrument has 24 items which assess three emotional intelligence dimensions: emotional attention, emotional clarity, and emotional repair. Cronbach's alpha was 0.89 for emotional attention, 0.87 for emotional clarity, and 0.85 for emotional repair.

Control variables

According to revised research, factors such as gender and age have an impact on entrepreneurial intention (Zisser et al., 2019; Pandang et al., 2022). The gender was assessed as male and female. The first options were coded as "0," and the second options were coded as "1."

Personality

The Spanish version (Cordero et al., 1999) of the NEO-Five Factor Inventory (NEO-FFI; Cordero et al., 1999) was used. This instrument consists of 60 items that evaluate five factors: neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness(C). Adequate reliability was obtained with our participants: Cronbach's alpha (N) = 0.83; Cronbach's alpha (E) = 0.85; Cronbach's alpha (O) = 0.82; Cronbach's alpha (A) = 0.71; Cronbach's alpha (C) = 0.80.

Procedure

The participants answered the questionnaires in the paper-and-pencil format in a single session of about 45 min. At the beginning of the session, the researchers explained the instructions and the guarantees regarding anonymity and confidentiality of the data. All participants signed a "consent to participate." The research was approved by the Ethics Commission of the Faculty of Psychology of the Complutense University of Madrid.

Data analyses

We use SPSS 25.0 for all statistical analyses. First, the mean, standard deviation, and correlations for all the variables included in the study were calculated.

To examine whether EI dimensions would explain the incremental variation in ESE that mediates the intention to become an entrepreneur, beyond the level attributable to personality traits and demographic variables, we performed two multiple hierarchical regression analyses. The indirect mediation role of ESE was analyzed using the procedure for testing multiple mediations described by Mac Kinnon (2008), which consists of estimating two separate regression equations. The basic strategy consists of a three-step hierarchical regression: Demographic variables are entered as covariates in the first step, the Big Five personality factors are added in the second step to control for any possible influence of this measure on ESE, and the three dimensions of the EI are entered in the last step. A similar procedure is also repeated for the second four-step multiple regression analysis, adding ESE as a mediator in the final step. Hierarchical regression is a subset of regression methods that attempt to generate theory-driven evidence for a given effect. In hierarchical regression, predictor variables are entered into the model in pre-determined iterations to see how the change in R^2 is affected. The hierarchical regression analysis occurs in iterations. The first iteration will be with the most highly correlated variable to the outcome, and then subsequently add in other variables that have some association on the outcome. If the entry of a variable leads to a significant increase in R^2 as per the F-statistic, then evidence of its predictive ability can be noted, as R^2 shows what proportion of the variation in the dependent variable is accounted for by the model. This same analysis procedure has been applied in many studies within the field of psychology, and specifically around entrepreneurial intention, an example is found in Mortan et al. (2014).

Results

Preliminary analyses

Table 1 shows the correlation coefficient matrix and descriptive statistics. The internal reliabilities of each measure (Cronbach's alphas) are in brackets.

Hierarchical regression analysis

Table 2 shows the results of the hierarchical regression analysis to predict ESE. The results show that the variables explain 15.3% of the total variance in the model ($R^2 = 0.15$, $p < 0.01$). Age and gender explain 3.9%, personality traits explain 8.7%, and emotional intelligence dimensions account for 2.7%. The three types of variables studied in the hierarchical model, demographic (gender and age), personality traits, and emotional intelligence, are related to ESE. Results indicate that gender shows a negative relation with ESE ($\beta = -0.149$, $p < 0.001$) suggesting that women have a lower ESE than men. Age shows a positive relation with ESE ($\beta = 0.114$, $p < 0.001$).

The hypotheses 1, 1a, and 1b have been partially confirmed, since all personality traits, except openness, show a relationship with entrepreneurial self-efficacy. In spite of this, the relationships between the dimensions of personality and ESE fulfill the hypotheses proposed. While extraversion ($\beta = 0.211$, $p < 0.001$) and conscientiousness ($\beta = 0.101$, $p < 0.001$) show a positive relation, neuroticism ($\beta = -0.112$, $p < 0.001$) and agreeableness ($\beta = -0.094$, $p < 0.001$) show a negative relation with entrepreneurial self-efficacy.

Hypothesis 2 was also confirmed by obtaining a significant positive relationship between EI and ESE: emotional attention ($\beta = 0.076$, $p < 0.01$), emotional clarity ($\beta = 0.056$, $p < 0.05$), and emotional repair ($\beta = 0.139$, $p < 0.001$).

Finally, a second multiple regression analysis was performed with four steps to which ESE was added (Table 3). Age and gender account for 1.5% of the variance. Personality traits explain 5.5%, and emotional intelligence dimensions explain 1.6%. ESE shows a positive relationship with entrepreneurial intention ($\beta = 0.585$, $p < 0.001$). Overall results shown that this model accounts for 37.4% of the total variance, so the hypotheses three and four were confirmed.

In summary, the results revealed a positive and significant relationship between ESE and the intention to become an entrepreneur impacted by the role of EI. Figure 1 represents the relations between ESE, EI and entrepreneurial intention, in the final model obtained controlling the effects of gender, age, and personality.

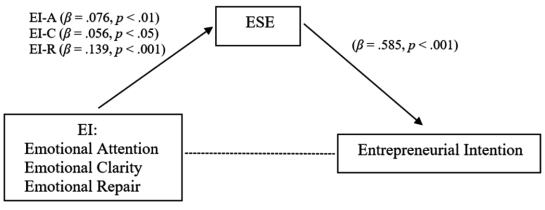

FIGURE 1
Final model.

Discussion and implications

Discussion

The main objective of this paper was to analyze the relationship among EI, ESE, and entrepreneurial intention, controlling for the

TABLE 1 Means, standard deviations (SD), correlations, and reliabilities (on the diagonal in brackets).

	M	SD	1	2	3	4	5	6	7	8	9	10
1. Emotional attention	28.22	6.42	(0.89)									
2. Emotional clarity	27.36	5.84	0.23**	(0.87)								
3. Emotional repair	27.71	6.13	0.11**	0.39**	(0.85)							
4. Entrepreneurial intention	3.72	1.48	0.03	0.13**	0.20**	(0.93)						
5. Entrepreneurial self-efficacy	3.16	1.30	0.04	0.21**	0.27**	0.60**	(0.90)					
6. Neuroticism	22.77	8.09	0.30**	−0.31**	−0.43**	−0.14**	−0.23**	(0.83)				
7. Extraversion	30.87	7.79	0.11**	0.24**	0.42**	0.19**	0.23**	−0.35**	(0.85)			
8. Openness	27.97	7.02	0.31**	0.12**	0.19**	−0.05	0.01	0.09**	0.16**	(0.82)		
9. Agreeableness	28.87	6.40	0.18**	0.12**	0.30**	0.02	−0.02	−0.17**	0.30**	0.19**	(0.71)	
10. Conscientiousness	30.57	7.22	0.06*	0.20**	0.22**	0.11**	0.14**	−0.24**	0.16**	0.05	0.13**	(0.80)

*$p < 0.05$ and **$p < 0.01$.

TABLE 2 Results of hierarchical regression analysis to predict entrepreneurial self-efficacy based on age, gender, personality, and emotional intelligence.

Variables	β	R^2	ΔR^2	ΔF	Sig.
Step 1		0.039	0.039	32.14	0.000
Age	0.114***				
Gender (0 = men; 1 = women)	−0.149***				
Step 2		0.126	0.087	31.66	0.000
Neuroticism	−0.112***				
Extraversion	0.211***				
Openness	0.011				
Agreeableness	−0.094***				
Conscientiousness	0.101***				
Step 3		0.153	0.027	16.92	0.000
Emotional attention	0.076**				
Emotional clarity	0.056*				
Emotional repair	0.139***				

β are the standardized regression coefficients.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

TABLE 3 Results of hierarchical regression analysis for age, gender, personality, and emotional intelligence predicting entrepreneurial intention mediated by ESE.

Variables	β	R^2	ΔR^2	ΔF	Sig.
Step 1		0.015	0.015	12.08	0.000
Age	0.100***				
Gender (0 = men; 1 = women)	−0.060*				
Step 2		0.070	0.055	18.65	0.000
Neuroticism	−0.027				
Extraversion	0.202***				
Openness	−0.067**				
Agreeableness	−0.035				
Conscientiousness	0.078**				
Step 3		0.086	0.016	9.37	0.000
Emotional attention	0.052				
Emotional clarity	0.019				
Emotional repair	0.128***				
Step 4		0.376	0.290	734.47	0.000
Entrepreneurial self-efficacy	0.585***				

β are the standardized regression coefficients.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

effects of the individual variables: personality and demographic variables (age and gender). The results confirmed all the proposed hypotheses: The personality traits are associated with entrepreneurial self-efficacy, emotional intelligence (EI) has a positive influence on entrepreneurial intention, and ESE mediates this relationship. This is inconsistent with some previous studies (Ferreira et al., 2022; Fu et al., 2022). All the variables studied—control variables (gender, age and personality traits) and emotional intelligence—are related to entrepreneurial self-efficacy.

Demographic variables

About gender, some theories suggest that men are expected to undertake more ventures than women (Bar Nir et al., 2011). In this sense, studies explored the impact of gender on motivations to become entrepreneurs from the point of view of self-efficacy. Our results agree with those found by other authors (Díaz-García and Jiménez-Moreno, 2010; Dempsey and Jennings, 2014). In general, women have a lower level of ESE than men. Zampetakis et al. (2017) found that women tend to show a lack of confidence in their ability to engage in entrepreneurial behaviors. Although many studies find these same results, including studies by the Global Entrepreneurship Monitor (GEM; Wennberg et al.,

2013), others suggest that the difference between men and women is not significant (Coleman and Kariv, 2014). Zhao et al. (2005) analyzed graduate students and found no significant role of gender in entrepreneurial self-efficacy.

In general, research shows that women showed less entrepreneurial intention than men (Strawser et al., 2021; Serrano-Pascual and Carretero-García, 2022). Some authors postulate that the differences in the results on the effect of gender on entrepreneurial self-efficacy may be influenced by personal attitudes toward entrepreneurship (Leroy et al., 2009; Baluku et al., 2020) or by gender role stereotypes (Sweida and Woods, 2015). Zisser et al. (2019), found that women and men varied in personality dimensions related to self-esteem, energy, risk attraction, and ambition; however, when women and men with high levels of EI are compared, they showed similar personality dispositions. Other research indicates that differences in ESE are associated with areas of specialization traditionally considered as consistent with gender stereotypes (Pandang et al., 2022). Regarding age, the older the participant, the greater their perception of entrepreneurial self-efficacy.

Personality

The first conclusion is that openness turned out to be unrelated to ESE. Extroversion and conscientiousness had a positive association with ESE, while the relation between ESE and neuroticism and agreeableness was negative (the higher the score in these latter traits, the lesser the entrepreneurial self-efficacy). These results are partially maintained in the second analysis, which evaluated predictors of entrepreneurial intention mediated by self-efficacy. In this case, extroversion and conscientiousness continued to positively predict entrepreneurial intention. Openness was negatively correlated with entrepreneurial intention, which indicated that the greater one's openness, the lower their entrepreneurial intention; finally, agreeableness and neuroticism were not significant predictors of entrepreneurial intention.

In general, these results agree with those found in the literature, in which extroversion and conscientiousness were associated with entrepreneurial intention, while agreeableness and neuroticism were negatively associated (Zhao et al., 2010; Brandstätter, 2011; Antoncic et al., 2015). The negative relationship between openness and entrepreneurship is striking, given that prior studies found high correlations between the two (Zhao et al., 2010; Antoncic et al., 2015). However, our results agree with those found by Mei et al. (2017). Future research should consider that there are multiple configurations of Big Five personality traits that vary by business form, environment, and type of entrepreneur (Şahin et al., 2019; Salmony and Kanbach, 2021).

Emotional intelligence

All dimensions of EI had a significant, positive correlation with ESE and entrepreneurial intention, especially emotional repair. These results match with those found by other authors (McLaughlin, 2019; Wen et al., 2020). As indicated above, there are few previous studies that have examined the influence of EI on entrepreneurial intention mediated by ESE. Our work expands knowledge of this relationship and found similar results to the obtained by other researchers regarding the moderating role of ESE in entrepreneurial intention (Newman et al., 2019; Huezo-Ponce et al., 2021; Wu and Tian, 2022).

The finding of our study suggests that people with higher scores in EI also have greater ESE. Managing and regulating one's own emotions and the emotions of others is an essential skill for the entrepreneurial process (Sadri et al., 2011; Ramoglou and Tsang, 2016). In a context where decision-making is recurrent, characterized by ambiguity and uncertainty, to have the ability to control and manage one's emotions, together with a high perception of self-confidence and self-efficacy, it will allow people to recognize opportunities, manage interpersonal relationships more efficiently, and have a higher tolerance for risk and uncertainty (Hirsh et al., 2012; Davidsson, 2015).

Theoretical implications

First, this study investigated the effects of individual variables on entrepreneurial self-efficacy related to EI and entrepreneurial intention. The results confirm previous studies (Mortan et al., 2014; Chien-Chi et al., 2020) and extend other findings on the role of entrepreneurial self-efficacy in the relationship between emotional intelligence and entrepreneurial intention using sociodemographic variables and personality traits as control variables which have not been sufficiently studied so far.

Second, the results on the relationship between personality traits and entrepreneurial intention stand out. In general, the results confirm previous studies but there are some contradictory findings. We found that openness was not directly related to entrepreneurial intention (Mei et al., 2017) contradicting the findings of others research (Kerr et al., 2018). The reason could be that the participants with high openness scores were university students who have a wide range of interests during this period, which limits their entrepreneurial possibilities.

These findings contribute to research on the influence of personality traits on entrepreneurial intention and broaden the discussion on the role of openness in entrepreneurial intention in university students.

Practical implications

Our results may have practical implications for the design of training strategies aimed at fostering entrepreneurial initiative.

Most entrepreneurship education, both to encourage entrepreneurial initiative as well as training designed for young entrepreneurs, is focused on technical planning and management knowledge, overlooking individual skills such as those highlighted in this study. The main conclusion that we obtain from this study is that the intention to start a business depends to a great extent on ESE; therefore, every entrepreneurship training and promotion program must include activities aimed at increasing ESE. The results also show that ESE is associated with EI, and especially with the Emotional Repair dimension. In stressful situations, very frequent during the entrepreneurial process, we can think of emotional attention, clarity, and repair as steps that we have to follow. First, we need to pay attention to what we are feeling, second, we need clarity about the emotion, and third, we need a strategy to repair the emotion, but entrepreneurial training should focus on the last: finding an effective strategy for repair and to better control and manage their own emotions. In addition, training programs need to implement a gender-sensitive approach, since women seem to have less ESE and therefore less entrepreneurial intention than men. One way could be including activities that facilitate the exploration of women's motivations and aspirations, identification and understanding of emotions, as well as self-regulation of emotions, since women tend to suffer more stress, often due to difficulties in reconciling work and personal life, which makes it difficult for them to succeed in their business actions.

We believe that our results can be especially valuable for educational institutions that wish to provide education for entrepreneurship, as well as organizations that want to develop internal talent through intrapreneurship actions.

Limitations and future research

The present work shows evidence for the relationship between EI and entrepreneurial intention and the mediating role of ESE. However, it has some limitations which should be considered in future research. First, a longitudinal study would be appropriate to investigate whether the intention translates into action. Second, although the sample is made up of students from all fields of knowledge, it would be ideal to expand the sample from the humanities and experimental sciences fields, and to analyze differences between the groups. Traditionally, research on entrepreneurial intention has been performed in the academic fields of business and enterprise, but it would be good to broaden the scope to all other academic areas. Third, this study was limited to a specific geographical area, and it would be interesting to carry out similar studies in other countries and different cultures. Few previous studies were found which address the relationship among EI, ESE, and entrepreneurial intention, so new studies should be conducted to provide more evidence about the relationship between these variables.

Finally, we must point out that, except for the association between ESE and entrepreneurial intention, some of the relationships found cannot be considered high (Tables 2, 3), although they are statistically significant. In this sense, it is evident that factors other than those considered here also influence the entrepreneurial intention and the ESE (socioeconomic level, social context, market, etc.).

Entrepreneurship is closely related to social and economic factors, and family is one of the main factors influencing university students to start their own entrepreneurship project (Antoncic et al., 2021). Therefore, it would be very interesting to include these additional variables in future research to examine their effect on entrepreneurial behavior as marketing self-efficacy (Antoncic et al., 2016).

Conclusion

This research focused on the study of one part of the entrepreneurial process, specifically, on analyzing individual variables that are antecedents of entrepreneurial intention and their relationships.

The results reveal that the classic profile of the Big Five associated with entrepreneurial behavior, characterized by high scores in extroversion and conscientiousness and low scores in neuroticism and agreeableness, shows high self-efficacy and entrepreneurial intention. Given the level of complexity and uncertainty that the entrepreneurial process implies, there is increasing evidence about the importance of emotions in understanding entrepreneurial behavior. People with high emotional intelligence show more capacity to identify and handle emotions and they show higher levels of self-efficacy and confidence to take on these challenges.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Deontology Commission of the Faculty of Psychology of the Complutense University of Madrid, obtaining a favorable report on October 2020 (Ref. 2020/21–005). The patients/participants provided their written informed consent to participate in this study.

Author contributions

MIL-N, SR-V, and ED-R contributed to the conception and design of the study and revised the final version of the manuscript. MIL-N organized the database and wrote the first draft of the

manuscript. SR-V performed the statistical analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2022.978313/full#supplementary-material

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The key enablers of competitive advantage formation in small and medium enterprises: The case of the Ha'il region

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The primary objective of this research is to establish the extent to which small and medium-sized businesses (SMEs) in the Ha'il region benefit from a significant competitive advantage brought about by an entrepreneurial mindset (innovativeness, proactiveness, risk-taking, competitive aggressiveness, and autonomy). To achieve these objectives, the study used a questionnaire to collect data. A total of 220 SMEs in the Ha'il region were surveyed. The participants completed an online self-administered survey and used the PLS-SEM technique. The researchers found a robust link between differentiation advantage and higher levels of innovativeness, proactiveness, risk-taking, competitive aggression, and autonomy. In addition, the outcomes of the survey reveal that a greater cost advantage is substantially associated with vastly greater innovativeness, proactiveness, risk-taking, and competitive aggression overall. However, cost advantage is not strongly correlated with autonomy. These findings are significant because they shed new light on how competitive advantages are formed through the entrepreneurial orientation of entrepreneurs in the Ha'il region. This is a significant theoretical contribution to the literature on entrepreneurial orientation, specifically in the context of SMEs. The findings may also be valuable in supporting SMEs in being successful by enhancing their competitiveness, as SMEs are key contributors to the development and growth of the economy.

KEYWORDS

competitive advantage, SMEs, entrepreneurial orientation, Ha'il region, entrepreneurship

Introduction

The idea of a competitive advantage refers to a group of characteristics or competencies that give a company an advantage over its competitors in terms of its ability to consistently generate higher profits (Roberts, 2002; Dagnino et al., 2021). A competitive advantage might stem from a firm's ability to lower its costs significantly below those of its competitors,

thus enjoying higher profit margins, or from developing high-end niche products and services that are difficult to find somewhere else (Thomson and Strickland, 2002; Huang et al., 2015). According to Barney (2001), a company is said to have a competitive edge when it is able to create value in ways that are either distinctive or more cost-effective than those of its competitors. In addition, for a competitive advantage to be of any use, customers' perceptions of the company must be positive, and they must perceive the company's identity differently from that of its competitors. Porter (1987) revealed that the major factors of competitive advantage are technical innovation, professional reputation, and healthy organizational relationships. Hitt et al. (1997) stated that each firm is a collection of diverse resources and talents, beginning with a resource-based perspective of the company. These available resources and creative skills make it possible to build and maintain a competitive advantage (see also Zahra, 2021).

Such resources and capabilities drive innovation, reputation, and relationships and help a firm capitalize on its core competencies (Gibson et al., 2021; Hossain et al., 2021). Core competencies can be seen as niche areas of expertise that stem from the intermingling of technological systems, structures, and work practices (Prahalad and Hamel, 1990; Jalil et al., 2021). Prahalad and Hamel (1990) argued that the following three key attributes characterize core competencies: (1) a competitive core competency enables access to different markets; (2) competitive core competencies enhance consumer perception of the benefits they may accrue from the use of a firm's products and/or resources; (3) core competitive competencies are difficult for competitors to replicate. Therefore, to build a competitive advantage successfully, a firm must offer what consumers perceive as superior value.

A sustainable competitive advantage is usually attained when firms generate exceptional value through capitalizing on their unique mix of resources, capabilities, and core competencies (Hitt et al., 1997; Davis and DeWitt, 2021). This assertion stems from the resource-based view, which argues that unique resources and capabilities are the key drivers of competitive advantage (Barney, 2021). For example, a firm can develop a strong competitive advantage if it has strong capabilities and resources in research and product development. Firms with strong research capabilities are typically pioneers in their industries and can, therefore, sustain their competitiveness for extended periods (McGee et al., 1999; Lu et al., 2021).

Network effects are another source that can be harnessed to develop a competitive advantage. For example, if a firm's offerings are of greater quality, then consumers are typically attracted to that firm and inclined to use its offerings. When Microsoft developed its user-friendly Windows operating system, it was easier than the older DOS system because it had a user interface. People, therefore, liked it and started recommending it through word-of-mouth to people in their networks. Those people then did the same and spread the word through their networks. This is an example of how network effects can also be used to sustain a competitive advantage (McIntyre and Srinivasan, 2017).

The number of small and medium-sized businesses (SMEs) has grown tremendously in the Ha'il region because of economic development plans, such as Vision 2030, and prior economic development schemes that aim to enhance the competitiveness of every region in Saudi Arabia. The Ha'il region has the potential to build an entrepreneurial environment to attract SMEs and help them grow. Activities have taken place between the SME authority in Saudi Arabia (Monsha'at) and the Commission for the Development of the Ha'il region, as well as the University of Ha'il. Therefore, more needs to be researched and understood regarding the mix of resources, capabilities, and core competencies in the Ha'il region that can be utilized to build an entrepreneurial environment conducive to SMEs' competitiveness.

An enterprise's competitiveness is its ability to outperform the competition in terms of revenue generated. There are two sources of an organization's competitiveness: differentiation in terms of niche markets or superior quality offerings, as well as lower cost, which stems from economies of scale. For a competitive advantage to be sustainable over the long term, its sources must be unique and difficult to replicate (Al-Mamary et al., 2022).

This research project aims to help these efforts by enhancing the current understanding of the different factors that influence the competitiveness of SMEs in the Ha'il region and of what can be done to build a unique entrepreneurial environment in the Ha'il region. This project will focus on entrepreneurial orientations in the Ha'il region that can be harnessed to help SMEs develop and sustain a competitive advantage. This research project will conduct a thorough study of the dimensions of entrepreneurial orientations in the Ha'il region that might shape the formation and endurance of an organization's competitive advantage. The focus will be on SMEs, given that one of the priorities of economic development in this region is to foster an entrepreneurial environment that promotes the development of SMEs.

Literature review

Strategic competitive advantage general overview

Sultan and Mason (2010) developed the basic principle of competitive advantage throughout SMEs in developing countries by stating that the economic viability of a company or organization is best attained through a competitive advantage; thus, when developing business plans, it is essential to meet customers' needs, as well as increase the level of customer satisfaction. These and other beliefs seem to be the basis for a new competitive business model, in which new products and services offered to the market are presented to existing and new customers at affordable and reasonable rates. This is done in the components of the marketing segmentation or in improved attention to specific customers' requirements in a highly specialized segmented market compared to industry rivals in a relatively similar business sector.

Competitive advantage has always been defined as an institution's potential capacity to distinguish its products or services from those of its competing industry rivals. Furthermore, a competitive advantage is necessary to create an effective business strategy aimed at achieving protected economic growth (Simpson et al., 2004). Jones (2003) developed the key characteristics of competitive advantage, particularly with regard to the formation of value propositions, and indicated the following three generic competitive strategies: the basic cost leadership process, long-term product or service differentiation, and focusing on products or services. These and other key marketing techniques can quickly contribute to the success of business goals and are widely used among different SMEs.

Thus, to outperform competitors, business organizations must promote additional economic value for their own products and services to their own customers (Barney and Hesterly, 2010). Consequentially, to gain a competitive advantage that encompasses the entire business process, a business could emphasize the fundamental value systems specific to its customer base. Users should be able to distinguish a company's goods and/or services from those of its industry rivals even after they have fully recognized the basic value systems of these kinds of goods and services. Nevertheless, in the particular instance of young entrepreneurs facing intense rivalries in a competitive market environment, achieving a competitive advantage depends on the corporate business environment.

In fact, there are three different elements of competitive advantage: (1) efficient goods and services at cost leadership, (2) fully branded, differentiated company goods or services, and (3) the product or service responds to specific customers' needs in a particular geographical location in terms of target market segmentation. The competitive advantage strategies chosen for SMEs and new entrepreneurs must be highly adaptable because they are heavily reliant on market trends, industry structure, and environmental forces that promote the emergence of significant strategic competitive advantages (Gassmann and Keupp, 2007). In this particular respect, new opportunities and enterprises must devote their own resources, business knowhow, and business capabilities to an efficient collaborative effort with suppliers' wider distribution channels and middleman channel partners to gain a competitive advantage throughout all value chain business processes (Pavic et al., 2007). These and other components contribute to a company's overall success in achieving a competitive advantage, which in turn could be used to develop an effective company strategy for long-term development and sustainability.

Each organization's potential to maintain a competitive advantage tends to vary with the corporate business environment, regardless of whether advanced technologies or interorganizational collaborative efforts are used to gather information. Zaridis (2009) stated that competitive advantage is important for young entrepreneurs because it enables a business to achieve sustainable development, as well as defensive capabilities, as a prerequisite for the successful monitoring of human and financial resource management. Hence, startups should closely examine all the various internal and external business macroenvironmental contextual factors. Similarly, working to develop a significant competitive advantage through competitive cost leadership, innovation, and business differentiation is critical, as is the ability to respond to the requirements of a given segment of individuals in full compliance with both the employment options and challenges of the institution's surrounding social and physical environment. Such a practice is consistent with the school of thought of suboptimal resource utilization for differentiated product market strategy. Furthermore, this practice assists a business enterprise in clearly distinguishing itself from its own industry rivals and prevents potential challenges and barriers to product substitution.

Dimensions of competitive advantage

The 17 According to Porter (1980, 1985), a company's product differentiation and cost leadership were indeed the only two generic strategies formulated to achieve a key market competitive advantage for an entire organization. Retail business customers appreciate product differentiation, which many perceive as a new technique because it satisfies the customers' basic demands. Conversely, cost leadership emphasizes reasonably low product costs in comparison to industry rivals (Porter, 1980, 1985). Porter (1980, 1985) further argued that cost leadership and product differentiation strategies have always been mutually incompatible. However, popular literature reviews and other similar scientific papers have challenged this mistaken notion, acknowledging that business organizations might consider pursuing components of both types of market strategy (Chenhall and Langfield-Smith, 1998).

Furthermore, a business organization has a competitive advantage when it can provide relatively similar economic advantages of competing companies at a relatively lower cost or when it can provide economic benefits that exceed the normal benefits or satisfaction given to customers. Therefore, the basic component of a competitive edge can be something that the business organization does that is completely unique, new, or extremely difficult to replicate (Prahalad and Hamel, 1990).

Essentially, competitive advantage must be created and preserved while satisfying customer requirements (Prahalad and Hamel, 1990; Ozbekler and Ozturkoglu, 2020). Conversely, cost leadership helps to create a significant value system, meaning providing excellent goods or services at a significantly lower cost than industry rivals or offering differentiation, i.e., delivering goods or services generally perceived to be exceptionally unique in relation to a certain essential feature (Markides and Williamson, 1994). Acknowledging how much each competitive level's pertinent resource base and technological capability influences costs and uniqueness is crucial in determining whether each must add value to the products and services made available (Duncan et al., 1998; Fainshmidt et al., 2019).

Cost as a dimension of competitors in the market

The primary emphasis on competitive cost discounts is perhaps the most important factor in predicting commonly used components by organizations, particularly those in markets where employees and customers appear to be responsive to price changes. Key factors that contribute to cheaper prices include comprehensive guides, academic credentials, professional training, fruitful expenditure, the implementation of appropriate manufacturing, and dissemination of policy initiatives (Deborah, 1998; Leiblein et al., 2017). Today, enterprises with this particular dimension frequently have monopolistic tendencies and the ability and willingness to develop a competitive advantage. Furthermore, organizations achieve this competitive advantage because their aggregated costs for economic activities are lower than those of competing companies.

Differentiation as a competitive dimension

Organizations perceive product differentiation as a far more essential element and distinguishable way of accomplishing a competitive advantage than that of a low-cost product business strategy (Kotha and Orne, 1989; Baines and Langfield-Smith, 2003). According to Dirisu et al. (2013) and Barney (1991), a business organization has a competitive advantage because once this is put in place, it creates a value creation strategy plan that current or future potential industry rivals do not have. Furthermore, competitive advantage can be defined as a company's current business advantage over existing rival companies.

Competitive dimensions of increased flexibility

The business organization's innate ability and financial power to provide the same wide range of important distinctions, as well as changes in the level of the customer base, result from its willingness to manage technological advancements. Instead, they design goods and services based on consumer expectations (Oberholzer-Gee and Yao, 2018). Organizations must react quickly to changes in consumer preferences, whether they rise or fall, and this is an essential component for competitive reasons because it allows for quickly serving customers' basic needs.

According to Karajewski and Ritzman (2005), flexibility is a corporate business operation that allows for efficiently meeting the basic needs of customers. Dillworth (1996) stated that flexibility, the ability to adjust and respond to consumers' needs and prevent unnecessary customer grievances, enables excellent customer service. Furthermore, to minimize overarching costs, business organizations control a larger market ownership stake than most other industry rivals.

Delivery as a competitive dimension

A business consumer's motivation is the willingness to pay a comparatively high price for the products or services they typically use in a given timeframe (Al-Bakri, 2005). Business organizations appear to be dynamic and responsive to consumers' basic essentials and desires when they obtain more customers willing to pay exorbitant prices for goods and services, at least until the major competing companies decide to enter the consumer-based retail market. According to Noori and Radford (1995), business organizations are likely to maintain competitive advantages placed above and beyond their industry rivals once costs are minimized and a substantial market share is achieved. Effective customer service delivery can be characterized as receiving a customer's requirements and then satisfying them within a given timeframe (Martins, 2020).

Quality as a competitive dimension

Business organizations that provide goods and services have always been concerned with the perceived value of those goods and services, which would, in turn, manage to achieve some level of service quality and reasonable and fair customer demand expectations through the visual structural design of the goods and services, particularly in terms of the perceived value of the customer's new company's products (Al-Bakri, 2005; Parker et al., 2017). Numerous business organizations strive for continuous improvement in the overall quality of their goods or services to compete with competitors. Overall, service quality as a competitive tool requires organizations to view service quality as a means of satisfying their customer base rather than as a means of solving structural problems and keeping costs low (Baker, 1992). A certain business organization can achieve a larger presence, a significantly higher rate of profitability, a higher sense of fulfillment to properly manage market value prices, and significant increases for services performed while also providing excellent goods or services.

According to Porter (1980, 1985) and Al-Mamary et al. (2020a), differentiation and cost advantage were the two main generic strategies to achieve a key market competitive advantage; hence, this study will focus on these two dimensions.

Entrepreneurial orientation model

Competitive advantage and innovativeness

Innovativeness is a company's proclivity to foster the development of truly innovative concepts, integrate advanced technologies, and move ahead with current product lines or service offers. Amodu and Aka (2017) and Edwards et al. (2014) described innovativeness as the propensity to pursue creative thinking and experiment with new ideas. Innovations result in enhanced skills and techniques for achieving full incremental improvements, while radical incremental innovations necessitate the acquisition of completely new skills and might even render current talent largely redundant. In any particular instance, the primary objective of organizational creativity is to create new products, services, systems, and processes. Major successful business organizations that have achieved enormous success in their organizational innovation outperform their competitors.

Innovativeness reflects a company's natural propensity to pursue and continue to support new innovative thoughts, uniqueness of ideas, research, and experimentation, which might

also lead to more efficient offerings or technological improvements (Lumpkin and Dess, 1996a; Al-Mamary et al., 2020b). The different goods and services that the business organization has launched in the real market are referred to as its innovativeness. According to some scientific theorists, innovation is intimately connected to entrepreneurial behavior because small business owners generate new and improved combinations of resource management simply by entering a new marketplace. In the specific situation of entrepreneurial orientation (EO), innovativeness is described as a more narrowly focused term, emphasizing the business's organizational meaning and significant market leadership, as well as the need for change in its core product offerings (Schillo, 2011). Hence, autonomy is considered an essential consideration of an EO mindset.

Competitive advantage and proactiveness

Significant risk-taking has always been defined as the proclivity to actively participate in extremely brave but conservative behavioral responses. Proactiveness, however, can be defined as a way for a business organization to perform its functions for enterprises in a complex, turbulent system or in early-stage areas of the economy where environmental circumstances are constantly changing and growth opportunities and chances for success abound. Proactivity is a forward-thinking, excellent opportunity mindset that entails implementing innovative goods and services better than competition and planning and preparing for a possible market to make a real change happen and maintain the environment (Lumpkin and Dess, 2001; Patel et al., 2014). Proactivity is the ability to prepare for and respond to long-term goals instead of responding appropriately to major events as they actually happen. A proactive, instead of reactive, organization is one that seeks new opportunities. Such business organizations act ahead of fluctuating business demand and therefore are frequently either the first ones to expand their business and bring in new customers or "fast followers," who enhance the continued efforts of the first-moving companies (Edwards et al., 2014).

Lumpkin and Dess (1996a) described proactiveness as taking action in anticipation of possible negative issues. Astrini et al. (2020) described proactiveness as the capacity and willingness to formulate strategies based on economic opportunities newly discovered through independent research and predictive market trend analysis. Proactivity helps businesses gain a competitive advantage while also placing the market competition in a position where it must provide a general response to the first-movers' new initiatives.

Competitive advantage and risk-taking

The propensity to actively participate in courageous rather than conservative behavioral actions is known as risk-taking (Edwards et al., 2014). Choosing to take risks has traditionally been strongly correlated with entrepreneurial behavior. Hence, risk-taking specifically refers to willingness to accept the potential consequences of something, such as when individuals work for themselves instead of being gainfully employed by someone else or when senior management makes a decision to dedicate considerable resources to major projects with unpredictable consequences (Schillo, 2011; Stagni et al., 2021).

Competitive advantage and competitive aggressiveness

Competitive aggressiveness corresponds to whether businesses respond to existing market trends and new demands throughout the competitive global consumer market system. Competitive aggressiveness considers the concentration of a company's business and continued attempts to outperform rival companies, as manifested by a confrontational position or an aggressive reaction (Lumpkin and Dess, 2001; Andrevski and Ferrier, 2019). Lumpkin and Dess (1996b) defined a competitive advantage of an aggressive nature as a company's business proclivity to effectively and passionately overcome its own market competition to gain access or continue improving placement to outperform existing competitors in the global consumer market system. Business organizations demonstrate competitive aggressiveness when they vigorously pursue their competitors' business opportunities (Schillo, 2011).

Competitive advantage and autonomy

The term "autonomy" refers to whether an individual or a group of individuals within an organization has the freedom to formulate and implement a start-up business idea. Individuals in a slightly elevated business organization have the freedom to hire those who introduce different concepts and are free from the straitjacket of bureaucratic inefficiency. Autonomy enables individuals and business organizations to more efficiently and successfully investigate and implement innovative thoughts without being constrained by organizational values and traditional practices (Edwards et al., 2014). From an EO business standpoint, autonomy exclusively focuses on system autonomy. Those same increased concentrations or business strategy measurements of autonomy enable a group of people (or ordinary people) to not only identify a problem but also target requirements for mitigating the occurrences of such a problem. Entrepreneurial autonomy usually involves having the innate potential to decide what, how, and when a private equity project could be accomplished and the business's overall future plan (Lumpkin et al., 2009; Bledow et al., 2021). Furthermore, Lumpkin and Dess (1996b) revealed that autonomy refers to an individual's or group of individuals' progressive development in attempting to bring an undefined new concept or a sense of direction while successfully seeing said concept through its delivery stages. In a broad sense, autonomy refers to the ability and commitment to achieve potential business opportunities on one's own. This then refers to the actions taken in the absence of a business organization's resource constraints.

The entrepreneurial mindset's similarities and distinctions

The innovation metric is concerned with the introduction of innovative products and services, as well as the creation of

enhanced versions of current products and services, as well as the introduction of unique techniques and procedures for the manufacture of those products. It was also stated that a firm's tendency to be on the cutting edge of new technologies demonstrated that it had an entrepreneurial spirit if the organization tended to be at the forefront of such innovations (Antoncic and Antoncic, 2011).

In addition, "proactiveness" is defined as the degree to which a company strives to set the standard in critical business areas such as the introduction of new products or services, operating technology, and administrative practices, rather than merely following competitors in these areas (Antoncic and Hisrich, 2003). Proactiveness is measured as the percentage of a company's overall efforts to do so. In other words, the degree to which a company goes above and beyond in its efforts to compete with others in its area is considered to be a measure of the organization's proactiveness. Being proactive means making changes that shake up the way people think and giving assertive decision-making more weight than tactical approaches.

An entrepreneurial strategy that incorporates components of risk-taking and experimentation, such as a mindset that is bold, directive, and opportunity-seeking, is consistent with risk-taking in the same way (Antoncic and Antoncic, 2011). Taking calculated chances necessitates exhibiting initiative, competitive aggressiveness, and boldness in one's views and actions, all of which are matched by the top management in the organization. These dimensions, which are related to entrepreneurship at the level of the firm, combine earlier categorizations. For instance, previous research has demonstrated that autonomous behavior, competitive aggression, and risk-taking all differ from one another in their own unique ways.

The evidence implies that risk-taking and competitive aggressiveness should share a component with proactiveness (Al-Mamary and Alshallaqi, 2022). Independence, which was previously thought of as a component of an entrepreneurial mindset but was found to emerge at the personal level rather than at the organizational level, was captured in this study with the addition of new dimensions. However, it was found that independence emerged at the personal level rather than at the organizational level.

The dimensions are distinct from one another in terms of the activities they engage in and the ways in which they handle different situations. The new business-venturing component of the company focuses on seeking and entering new companies within the existing organization that are relevant to the company's current products or markets. When it comes to the innovativeness component, the primary focus is on the development of cutting-edge goods, processes, and technologies. This is because innovation is directly correlated to increased competitive advantage (Chahal and Bakshi, 2015). The self-renewal dimension places a significant emphasis on putting one's attention toward the reformulation, reorganization, and transformation of organizational strategies. Satyanarayana et al. (2022) reported that the proactiveness statistic is a representation of the top management's commitment to generating higher competitiveness. Thus, proactiveness comprises initiative, risk-taking, competitive aggression, and boldness. Because of this, it is feasible that every aspect of an entrepreneur's personality can change in its own unique way. It is possible to break apart the numerous dimensions of intrapreneurship into their own distinct concepts.

This suggests that the basis of intrapreneurship can be found in the fact that various dimensions can be separate from one another while also being associated with one another. From these points of view, the concept of "intrapreneurship" is made up of these dimensions, which are different enough from each other to keep them from being duplicated but similar enough to be thought of as part of the same concept.

Entrepreneurial personality traits

The personality aspects of entrepreneurship were previously used to characterize a person's "big 5" personality traits have been renamed "OCEAN," by (Antoncic et al., 2015) and the early taxonomy-building efforts can best be summarized as follows: -.

Openness

Because it makes it easier to find new opportunities for business, being open to new ideas is an essential quality for entrepreneurs to possess because it speeds up the process of finding new ventures to pursue (Antoncic et al., 2018; Awwad and Al-Aseer, 2021). Therefore, the ability to act quickly and decisively is critically important for success in entrepreneurship. Kritikos (2022), Tsaknis et al. (2022), and Postigo et al. (2021) studies that looked at the connection between personality and entrepreneurship found that how open someone is to new ideas is a big part of whether or not they will be successful as an entrepreneur.

A person who actively looks out for business opportunities and turns them into viable entrepreneurs is referred to as an "entrepreneur." When beginning a business, one of the most critical skills to have is the ability to recognize opportunities ahead of time and capitalize on them before others do. Consequently, the first step toward being an entrepreneur is being able to recognize an opportunity.

Conscientiousness

Brockhaus Sr (1980) has shown that people who start their own businesses like to make choices that involve a moderate amount of risk, despise performing duties that are repetitive, and look for knowledge about the precise consequences of the decisions they make. Since the content of these traits is similar to that of the big five factors, it is clear that the drive to succeed is one of the most important parts of being conscientious.

Zhou et al. (2018) also observed that highly conscientious people are characteristic of the entrepreneurial-type, and among the big five personality qualities, conscientiousness has the strongest association with entrepreneurial status compared to

managerial status. This is the case when comparing the five big personality traits to each other.

Extraversion

People who fall under the category of extraverts are typically self-assured and authoritative, in addition to being vivacious, daring, and exuberant. Because of this, it was discovered that people who owned their own businesses had a more positive attitude toward life than people who did not own their own businesses. Extroverts have a greater propensity to be upbeat, cheerful, and enthusiastic than introverts do.

In addition, Leutner et al. (2014) reported that entrepreneurs typically had high scores on the measures measuring conscientiousness and extraversion. Therefore, extraversion may be an asset to the success of an effective leader.

Agreeableness

The term "agreeability" refers to a broad variety of human attributes, any one of which may have a favorable or negative impact on one's ability to run a successful business (Anitei, 2015). Entrepreneurs typically have a great deal of drive and ambition, but if they aren't careful, this may work against them in a significant way, causing their firms and careers to suffer. Certain business entrepreneurs believe that the ways in which they conduct their operations are the only ones that should be followed.

As a result, those that venture out on their own in business face significant entrepreneurs while attempting to adapt. On the one hand, working with entrepreneurs may be motivating because of their unlimited excitement, charismatic personalities, strong competitiveness, and laser concentration on accomplishing their goals. This means that an individual's unhealthy preoccupation with micromanaging every aspect of their business could have a detrimental impact on the quality of their personal relationships.

Neuroticism

The stereotype of entrepreneurs is that they are eccentric people whose behavior and ideas are shocking to others and go against the grain of society (Anitei, 2015). Because they are under a great deal of pressure, they are erratic and they make decisions too quickly for their own good. Because of this, we need to view the entrepreneur as a character with a great deal of dimensionality. There may be a consistent pattern of behavior among entrepreneurs that can be traced back to the problems they faced when they were just starting out.

Hence, entrepreneurs' tendency toward impulsivity, unhappiness, rejection, or lack of control may undermine their confidence. When faced with these challenges, business owners and entrepreneurs may develop a fixation on opportunities to demonstrate their authority and autonomy, which may prevent them from meeting the requirements of individuals in their immediate environment. Therefore, the majority of the research that has been carried out up to this point reveals that neuroticism has a negative correlation with the ownership of an entrepreneurial enterprise.

The direct correlation between entrepreneurial orientation and competitive advantages

Regarding strategy information (generic strategies) in conjunction with strategic planning, shaping the processes of entrepreneurial success appears to have become a rational and reasonable line of independent investigation. This orientation provides a framework for developing and incorporating competitive strategies. Thus, researching and developing the actual content of entrepreneurial orientation and competitive strategy is a potentially fruitful undertaking of research (Rauch et al., 2009; Wales et al., 2011; Lechner and Gudmundsson, 2014; Al-Harasi et al., 2021). According to Van Geenhuizen et al. (2008), entrepreneurial orientation has been identified as a potentially effective alternative to the negative issues that businesses and organizations face in achieving long-term, unique competitive advantages. Thus, there appears to be a significant concern in broadening SMEs' understanding of the complexities of entrepreneurial orientation. Various facets of entrepreneurial orientation have different influences on competitive advantages (Lechner and Gudmundsson, 2014; Chen and Miller, 2015).

Recent research findings on entrepreneurial orientation and competitive advantages from the perspective of Saudi Arabia

Alzahrani (2020) investigated the long-term impact of entrepreneurial orientation on organizational effectiveness and the influence of absorptive capacity. The results demonstrated that organizational entrepreneurial orientation had a substantial influence on business performance and that project management success mediates the whole correlation substantially. Furthermore, absorptive capacity moderated the correlation between entrepreneurial orientation and project management success, and this correlation became larger and more powerful with the mere existence of absorptive capacity.

Abdulrab et al. (2021) explored the influence of strategic orientations in mediating the correlation between entrepreneurial orientation and efficient implementation in Saudi SMEs. The research findings revealed that KSA SME management teams should maintain an intense focus on entrepreneurial behavior and develop a unique business strategy approach to achieve overall effectiveness. It was strongly suggested that decision makers demonstrate business and management initiatives to help SMEs shape entrepreneurial ventures.

Al-Mamary et al. (2020a) reviewed the existing literature on entrepreneurial orientation to establish the severity with which entrepreneurial orientation strongly influences the financial and nonfinancial achievements of Saudi SMEs. The research findings further clarified the correlation between such a company's

business entrepreneurial orientation and its financial and nonfinancial achievements.

Albasri (2020) considered the effect of entrepreneurial orientation combined with three main functionalities in helping to improve the efficiency of Saudi SMEs. According to the research results, entrepreneurial orientation, exploration, exploitation, and realignment of new technical capabilities all had favorable impacts on the overarching success and performance of SMEs. The findings also revealed that entrepreneurial orientation hardly mediates the impact of entrepreneurial orientation on achieving SMEs' performance.

Abdulrab et al. (2020) used a quantitative research approach to conduct a research project on the general influence of entrepreneurial orientation and key strategic orientation drivers on the financial and nonfinancial performances of SMEs. The results demonstrated that entrepreneurial orientation, market orientation (MO), and technology orientation (TO) each had a constructive and substantial influence on SME financial performance and that MO and TO had a constructive and substantial adverse effect on nonfinancial performance. It was also discovered that EO seemed to have little or no negative impact on the nonfinancial performance of SMEs. According to the research conclusions, SMEs should improve their understanding of the aspects of key financial and nonfinancial economic indicators to fully comprehend them and propose consistently successful strategies.

Alsolamy (2019) investigated the practical roles of EO and innovation capacity (IC) in the long-term competitive advantage of SMEs and found that EO does indeed have a massive influence, both in terms of innovation capacity and competitive advantage. Furthermore, the final assessment of the research findings indicated that Saudi social venture enterprises' innovativeness has a favorable influence on their long-term significant competitive advantage.

Conceptual model

The proposed conceptual structure of this research study, which was designed to evaluate the research question, is illustrated in Figure 1.

Materials and methods

Sample and procedure

Through social media platforms, including WhatsApp, LinkedIn, and email groups, a survey was made available online to Saudi SMEs in the Ha'il region. The respondents had to complete the survey in Arabic using Google Forms, which were utilized to gather the data. It took approximately 2 months to acquire all the data. Of the 231 questionnaires received, 11 were rejected due to missing or incomplete information. For additional analysis, 220 responses were recorded. A total of 109 service SMEs and 111 product SMEs participated in this study, accounting for 49.5 and 50.5% of the total participants, respectively. With regard to the participants' work experience at their respective firms, 104 (47.3%) had less than 1 year of experience, 63 (28.6%) had 1–5 years of experience, 26 (11.8%) had 5–10 years of experience, 20 (9.1%) had 11–15 years of experience, and 7 (3.2%) had more than 15 years of experience. Similarly, 62 (28.2%) of the participants were owners, 47 (21.4%) were managers, 90 (40.9%) were owners and managers of their firms, and 21 (9.5%) were staff. In terms of the number of employees at the firm, 119 firms had fewer than 25 staff members, 56 firms had 26–49 staff members, 36 firms had 50–150 staff members, and 9 firms had 151–250 staff, accounting for 54.1, 25.5, 16.3, and 4.1% of the total participants, respectively (see Table 1).

Measures

Entrepreneurial orientation

The research examined five facets of EO, including three items pertaining to innovativeness, three items pertaining to proactiveness, three items pertaining to risk-taking, three items pertaining to competitive aggressiveness, and three items pertaining to autonomy as a sense of self-reliance. The items' compositions were taken from Njoroge (2015) and Anwar and Shah (2020). Each item was evaluated on a Likert-type scale, with a maximum score of five.

Competitive advantage

Both cost advantage and differentiation advantage (consisting of four separate factors) were investigated in this study as potential components of competitive advantage (three items). In this particular study, 5-point Likert scales were utilized to quantitatively analyze several aspects of competitive advantage (Becker et al., 2022).

Data analysis

Data were analyzed using the statistical program SmartPLS v4.0.6.9. In the first step of this process, various measurement model methodologies, such as Cronbach's alpha (CA), extracted composite reliability (CR), heterotrait-monotrait (HTMT) ratio, and average variance (AVE), were investigated. Second, to examine the theoretical model, this study employed discriminant validity. The structural model was evaluated in the third phase by looking at the common method bias (variance inflation factor), coefficient of determination (R2), predictive relevance (Q2), and standardized root mean square residual (SRMR). Structural equation modeling (SEM) was another approach that was utilized in this investigation to examine the hypotheses.

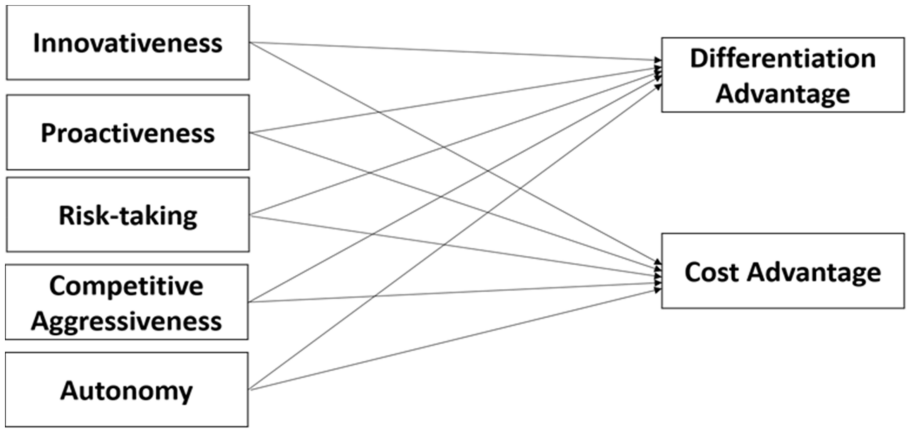

FIGURE 1
Conceptual framework.

TABLE 1 Demographic information.

Controls		Variance	
Participant's Position	Owner	62	(28.2%)
	Manager	47	(21.4%)
	Owner and Manager	90	(40.9%)
	Staff	21	(9.5%)
Year of Experience	< 1 year	104	(47.3%)
	1–5 years	63	(28.6%)
	5–10 years	20	(9.1%)
	11–15 years	7	(3.2%)
	> 15 years	26	(11.8%)
Number of Employees	< 25	119	(54.1%)
	26–49	56	(25.5%)
	50–150	36	(16.3%)
	151–250	9	(4.1%)
SME Type	Service	109	(49.50%)
	Product	111	(50.50%)

Statistical analysis and results

Measurement model

In several instances, CA was utilized to obtain the reliability of the different scales. The measuring scales' validity was determined to be substantial, with values of 0.870 for Autonomy, 0.852 for Competitive Aggressiveness, 0.834 for Innovativeness, 0.838 for Proactiveness, 0.801 for Risk-Taking, 0.768 for Cost, and 0.860 for Differentiation. The internal consistency reliability was deemed to be adequate (i.e., equal to or above 0.7, as suggested by Hair et al., 2017) in the current investigation and varied from 0.883 to 0.920. Additionally, the current investigation revealed an AVE of at least 0.50 (Fornell and Larcker, 1981; Chin, 1998; Al-Mamary, 2022a, 2022b; see Table 2).

An HTMT test was carried out to determine the discriminant validity of the components (Henseler et al., 2015). The HTMT ratio must be lower than the benchmark value of 0.85 to show that discriminant validity was achieved (Table 3). The fact that none of the figures were higher than the threshold of 0.85 suggests that discriminant validity remained adequate (Henseler et al., 2015). Additionally, the correlations between constructs related to the relevant construct and the AVE square root values for each construct were compared (Fornell and Larcker, 1981). The results show that the AVE values are always higher than the correlations between them (see Table 4).

Assessment of structural model

This research used the variance inflation factor (VIF) to investigate collinearity problems and common technique bias. Because Kock (2015) and Hair et al. (2017) did not discover any values equal to or lower than 3.3, they concluded that this structural model was free of bias (see Table 5).

In this particular investigation, a Harman single-factor test was also utilized to assess common technique variance (Harman, 1960). If a factor analysis shows a single-component structure or if the original single factor explains more than 50% of the variation in the observations, this suggests that the current data are sensitive to typical technique bias. However, if the original single factor explains less than 50% of the variation in the observations, this suggests that the data are not sensitive to typical technique bias.

Furthermore, the results showed that EO explained 55.5% of the variance in cost. EO also explained 61.6% of the variance in differentiation. According to Cohen (2013), the acquired R2 values have an adequate degree of explanatory power, which is an indication of a substantial model. While the accepted R2 rule of thumb varies, Cohen (2013) considered R2 values of 0.26 and above to be significant, indicating that the predicted model fits the data well. Within the scope of this analysis, endogenous variables

TABLE 2 Measurement model.

Construct	Code	Loading	CA	CR	AVE
Autonomy			0.870	0.920	0.794
	Auto1	0.907			
	Auto2	0.865			
	Auto3	0.900			
Competitive aggressiveness			0.852	0.910	0.772
	ComAg1	0.905			
	ComAg2	0.843			
	ComAg3	0.887			
Innovativeness			0.834	0.900	0.751
	Innov1	0.846			
	Innov2	0.861			
	Innov3	0.892			
Proactiveness			0.838	0.903	0.756
	Proac1	0.864			
	Proac2	0.858			
	Proac3	0.886			
Risk taking			0.801	0.883	0.716
	Risk1	0.850			
	Risk2	0.819			
	Risk3	0.868			
Cost			0.769	0.866	0.684
	Cost1	0.824			
	Cost2	0.801			
	Cost3	0.856			
Differentiation			0.860	0.906	0.706
	Differ1	0.777			
	Differ2	0.853			
	Differ3	0.868			
	Differ4	0.860			

TABLE 3 HTMT.

	Auto	ComAg	Cost	Differ	Innov	Proac
ComAg	0.766					
Cost	0.734	0.802				
Differ	0.799	0.782	0.740			
Innov	0.754	0.811	0.802	0.757		
Proac	0.816	0.829	0.783	0.799	0.818	
Risk	0.844	0.820	0.843	0.829	0.836	0.807

showed R2 values of 0.555 and 0.616, respectively (see Table 5; Figure 2).

According to Geisser (1974) and Stone (1974), predictive relevance is a measure of a model's ability to predict outcomes for data that are not included in the sample. According to Hair et al. (2017), an endogenous construct has moderate significance when it has a value of 0.02, medium significance when it has a value of 0.15, and significant significance when it has a value of 0.35. According to this rule, the endogenous variables in this study—cost and differentiation—showed large predictive relevance values (see Table 5).

TABLE 4 Fornell–Larcker criterion.

	Auto	ComAg	Cost	Differ	Innov	Proac	Risk
Auto	0.891						
ComAg	0.661	0.879					
Cost	0.603	0.654	0.827				
Differ	0.691	0.672	0.604	0.840			
Innov	0.644	0.686	0.646	0.644	0.866		
Proac	0.698	0.702	0.631	0.678	0.685	0.869	
Risk	0.705	0.678	0.662	0.692	0.685	0.663	0.846

TABLE 5 Structured model results.

Construct	R2	Adj. R2	f2	Q^2predict	VIF	SRMR
Cost	0.555	0.550		0.536		0.035
Differ	0.616	0.612		0.606		
Auto*Cost			0.00416		2.575	
ComAg*Cost			0.038852		2.596	
Innov*Cost			0.032943		2.509	
Proac*Cost			0.016248		2.688	
Risk*Cost			0.051372		2.637	
Auto*Differ			0.051501		2.575	
ComAg*Differ			0.030258		2.596	
Innov*Differ			0.010946		2.509	
Proac*Differ			0.030872		2.688	
Risk*Differ			0.050435		2.637	

SRMR, as suggested by Hu and Bentler (1998) was used to determine how well the data fit. The SRMR was 0.035, which was less than the required 0.08 and indicated a successful match (Henseler et al., 2016).

Discussion

The purpose of this research was to investigate the impact of EO factors on the competitive advantage (differentiation and cost) of Saudi SMEs in the Ha'il region. It was hypothesized that differentiation (DIFFER) would be influenced by innovativeness (INNOV). The results showed that INNOV had a positive effect on DIFFER ($\beta = 0.103$, $t = 2.069$, $p < 0.05$; see Table 6). Thus, Hypothesis 1 is accepted. The results show that INNOV is a key predictor of differentiation strategy for the business owners of SMEs in the Ha'il region of Saudi Arabia. Entrepreneurs who think creatively produce unusual solutions that might be critical to their clients. This finding of differentiation and innovativeness confirms the findings of Lumpkin and Dess (1996a), Zeebaree and Siron (2017), and Hossain and Azmi (2020). According to the research findings, INNOV has a direct and positive impact on cost advantage (COST; $\beta = 0.192$, $t = 2.992$, $p < 0.05$; see Table 6). This supports Hypothesis 2. This study supported evidence from

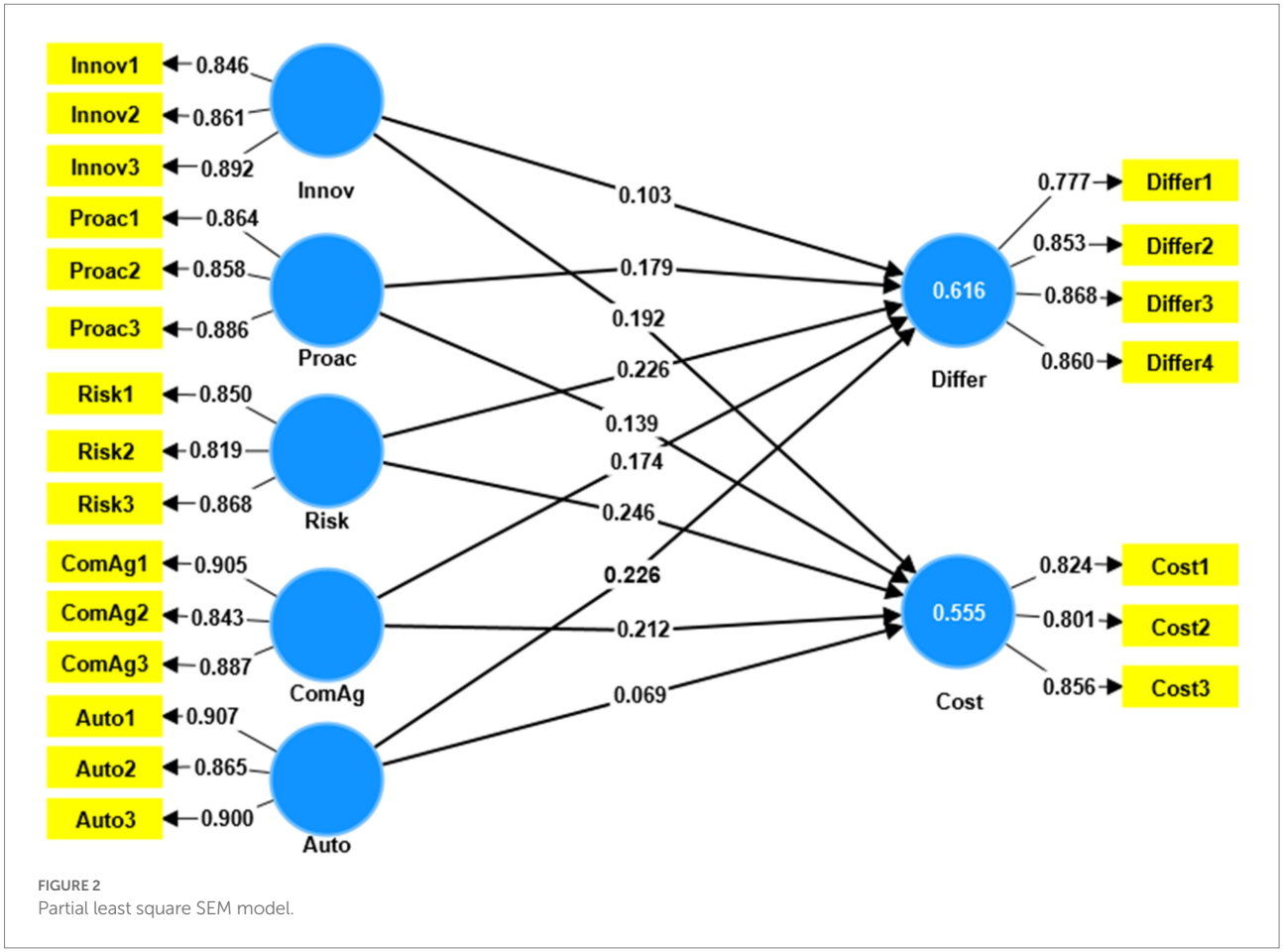

FIGURE 2
Partial least square SEM model.

TABLE 6 Hypothesis constructs.

Effects	Relations	β	Mean	SD	*t*-value	*value of p*	Decision
H1	INNOV - > DIFFER	0.103	0.106	0.050	2.069	0.039*	Supported
H2	INNOV - > COST	0.192	0.191	0.064	2.992	0.003*	Supported
H3	PROAC - > DIFFER	0.179	0.175	0.048	3.710	0.000**	Supported
H4	PROAC - > COST	0.139	0.140	0.060	2.329	0.020*	Supported
H5	RISK - > DIFFER	0.226	0.226	0.047	4.764	0.000**	Supported
H6	RISK - > COST	0.246	0.244	0.077	3.204	0.001*	Supported
H7	COMAG - > DIFFER	0.174	0.173	0.049	3.521	0.000**	Supported
H8	COMAG - > COST	0.212	0.211	0.060	3.533	0.000**	Supported
H9	AUTO - > DIFFER	0.226	0.227	0.050	4.475	0.000**	Supported
H10	AUTO - > COST	0.069	0.072	0.057	1.207	0.227	Rejected

*$p < 0.05$; **$p < 0.1$.

previous observations (e.g., Porter, 1985; Dowling and McGee, 1994; Zeebaree and Siron, 2017). Leutner et al. (2014) found that innovativeness had an insignificant influence on the cost advantage strategy. The findings of the current study, however, contradict those of Leutner et al. (2014). This may be explained by the fact that introducing cost-effective designs for established firms' product/service categories necessitates some form of innovation.

The impact of proactiveness (PROAC) on DIFFER was also investigated in this study. There was a statistically significant correlation between PROAC and DIFFER (β = 0.179, t = 3.710, $p < 0.1$; see Table 6). Gitau et al. (2016) found that for small firms to be active in identifying and exploiting business opportunities, they must be proactive. These findings also confirmed the conclusions of other studies on this subject (e.g., Lilien et al., 2002; Hughes and Morgan, 2007; Zeebaree and Siron, 2017; Hossain and Azmi, 2020). However, this outcome is contrary to that of Lechner and Gudmundsson (2014) and Leutner et al. (2014), who found inconsistencies between firms' proactiveness and differentiation strategies. PROAC was also

thought to have a substantial impact on COST. PROAC was found to have a significant effect on COST (β = 0.139, t = 3.329, $p < 0.05$; see Table 6). Allen et al. (2006), Hughes and Morgan (2007), and Zeebaree and Siron (2017) all found similar findings. Contrarily, the results of the present study do not align with earlier research by Leutner et al. (2014), which revealed that proactiveness had no appreciable impact on cost advantage.

The research findings of this study have demonstrated that taking risks (RISK) has a direct and positive impact on DIFFER (β = 0.226, t = 4.764, p < 0.1; see Table 6). Thus, Hypothesis 5 was accepted. This finding is consistent with those found in earlier studies (e.g., Morris and Kuratko, 2002; Dewan et al., 2007; Leutner et al., 2014; Zeebaree and Siron, 2017; Hossain and Azmi, 2020). It was also anticipated that the level of RISK would have a significant effect on COST. According to the findings, there was a statistically significant relationship between RISK and COST (β = 0.246, t = 3.204, p < 0.05; see Table 6). It appears that these findings can be attributed to the fact that taking risks should be more significant in the case of small businesses to achieve cost leadership than they should be to achieve distinctiveness. These findings are comparable to those found in earlier studies (e.g., Leutner et al., 2014; Zeebaree and Siron, 2017).

According to the findings of this study, which can be found in Table 6 (β = 0.174; t = 3.533; p < 0.1), competitive aggression (COMAG) was discovered to have an influence on DIFFER. Therefore, Hypothesis 7 has been shown to be correct. In addition, COST was significantly affected by COMAG (β = 0.212, t = 4.620, p < 0.05; see Table 6). Therefore, the validities of Hypotheses 7 and 8 were confirmed. The findings of this study provide substantial support for the results reached by other investigations on this subject (e.g., Porter, 1985; Blumentritt and Danis, 2006; Leutner et al., 2014). According to Porter (1980), for a cost leadership strategy to be successful, a large portion of the market is required.

Furthermore, the impact of autonomy (AUTO) on DIFFER was investigated in this study. The results show that taking risks (RISK) has a significant impact on DIFFER (β = 0.226, t = 4.475, p < 0.1; see Table 6). Thus, Hypothesis 9 was supported. This finding is consistent with earlier observations (e.g., Lumpkin and Dess, 1996b; Hughes and Morgan, 2007; Lumpkin et al., 2009; Leutner et al., 2014). This could be related to the fact that when organizations empower their employees and give them more autonomy, people are more likely to be creative, come up with new ideas, engage in open communication, and be more focused on customer involvement and orientation. Finally, this study's research findings revealed that AUTO had no effect on COST (β = 0.069, t = 1.207, p < 0.05; see Table 6). This means that Hypothesis 10 has been rejected. Thus, the outcomes conflict with previous studies (e.g., Leutner et al., 2014; Grant, 2021). Therefore, it is possible that the attributes of SMEs' owners, managers, or employees in the Ha'il region can drive them to be empowered and creative in their businesses regardless of the cost strategy pursued.

In a nutshell, the findings of this study indicate that people who have a more entrepreneurial mindset are not all that different from businesses that have an entrepreneurial mindset, as long as both are provided with an environment that promotes their success. This is the main takeaway from the study.

Theoretical implications

The results of this study expand the scope of EO research and demonstrate that SMEs that support and promote innovative ideas, take advantage of first-mover opportunities, and anticipate future events outperform competitors who set high market share goals or use aggressive measures, such as price cuts (Lumpkin and Dess, 1996a), to achieve competitive advantage (differentiation and cost). It is now well established that entrepreneurial inclination influences competitive advantage. However, the authors of this study did not conduct any analyses to determine the nature of the connection that exists between the EO aspects (innovation, proactivity, risk-taking, aggression in the marketplace, and autonomy) and the competitive advantage dimensions (difference and cost). This study contributes to the existing body of knowledge by investigating the effects of EO's five aspects on the dimensions of competitive advantage held by SMEs located in the Ha'il region.

In addition, there has been a dearth of empirical evidence regarding Saudi SMEs as a consequence of the theoretical findings of earlier research on the impact of autonomy on cost advantage (e.g., Lumpkin and Dess, 1996b; Hughes and Morgan, 2007; Lumpkin et al., 2009; Leutner et al., 2014; Grant, 2021). By conducting an investigation of previous research studies' hypotheses among Saudi SMEs in the Ha'il region, the present study contributes to the existing body of information.

Practical and managerial implications

This study provides useful insights into the ways in which EO might help build a company's competitive edge. It is critical to recognize that EO is the starting point for developing and implementing competitive advantage initiatives. SME owners or managers should improve their awareness and knowledge of the importance of research and development, technological leadership, proactive behaviors, and employee empowerment. Furthermore, the research provided a practical contribution by illustrating how Saudi entrepreneurs may differentiate their services through their entrepreneurial approach (EO). In addition, the findings of this research have the potential to act as a reliable reference for those who work in commercial settings. The findings indicate that EO variables are key and relevant elements in cost strategy and differentiation.

According to the findings of this study, if the owners or managers of SMEs utilize the findings by considering the structures, strategy-making processes, and business attributes that

are characterized by their inventiveness, proactiveness, risk-taking, aggressiveness in competition, and autonomy, they will increase their firms' competitive advantage. The findings may also be valuable in supporting SMEs in being successful, as SMEs are key contributors to the development and growth of the economy.

Conclusion, limitations, and directions for future research

The research was conducted in the Ha'il region of Saudi Arabia on SMEs to see how the entrepreneurial practices of these companies affected their competitive edge. In the Ha'il context, the study placed particular emphasis on the advantages that SMEs have over larger corporations in terms of competitive advantage. These advantages include autonomy, innovativeness, risk-taking, proactivity, and aggressive competition.

Although all of this study's objectives were accomplished, there are certain limitations that should be addressed, and relevant suggestions for future research should be made. A very small sample size calls for an extensive amount of replication. Since this study is based on cross-sectional data, further longitudinal research is needed to learn more about the problem, determine how the different parts interact with each other, and see if the results would be different if longitudinal data were used instead of cross-sectional data. Second, this study's data were collected from 220 SMEs in Ha'il, Saudi Arabia. Therefore, future studies could expand the sample to include all other SMEs from different parts of Saudi Arabia so that the results can be used in a wider range of situations.

Third, the current study adopted a quantitative methodology and distributed questionnaires to the managers or owners of SMEs. Thus, future studies should consider obtaining more in-depth qualitative data from SMEs' owners or managers. Future research may employ both quantitative and qualitative approaches to produce more accurate and comprehensive findings.

Fourth, the investigation of mediating factors, such as strategic orientations, Organizational Citizenship Behavior (OCB), learning orientation, and knowledge management, should be covered in future research. Links between the model's direct and indirect paths may be examined using a variety of methods.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

MT: conceptualization, literature review, resources, data collection, writing—original draft preparation, and project administration. MAl: conceptualization, literature review, resources, data collection, and writing—original draft preparation. YA-M: conceptualization, methodology, software, validation, formal analysis, resources, data collection, and writing—original draft preparation. MAb: conceptualization, methodology, software, validation, formal analysis, resources, data curation, and writing—original draft preparation. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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How decision-styles and cultural orientation influence entrepreneurial and social entrepreneurial intentions: A cross-cultural comparison

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This paper investigates how maximizing or satisficing decision styles and cultural orientation influence individuals' entrepreneurial intentions. With a growing interest in social entrepreneurship, it also measures if these factors encourage individuals to start ventures with a social mission. Two studies are conducted to compare students' entrepreneurial intentions in the U.S. and in Slovenia. By identifying that maximizing decision styles are associated with an individualistic cultural orientation in both the U.S. and Slovenia, the current study indicates that the maximizing – individualism connection spans national and cultural boundaries. In the U.S. sample, individualism mediated the relationship between decision styles and entrepreneurial intentions, suggesting that in individualistic cultures, such as the U.S., those who maximize their decision efforts and apply a more individualistic cultural perspective are especially inclined to pursue entrepreneurial opportunities. Similarly, individualism mediated the relationship between maximizing and social entrepreneurial intentions in the U.S. sample; suggesting that maximizers who are less individualistic may be more likely to start social enterprises over traditional ventures. Among the Slovenian sample, there was a marginally significant relationship between maximizing and entrepreneurial intentions and no relationship with social entrepreneurial intentions. These cross-cultural differences are discussed in relation to the economic and social conditions in each country.

KEYWORDS

entrepreneurial intentions, cultural orientation, maximizing, satisficing, decision styles, social entrepreneurial intention

Introduction

It is widely accepted that entrepreneurs contribute to economic growth through innovation, new job creation, and competitiveness (Carree and Thurik, 2005; Acs et al., 2012; Stoica et al., 2020), leading to a wealth of research attempting to understand what drives people to pursue new business opportunities. Among a growing list of

entrepreneurial trait variables in this research stream, it appears that the way people approach decisions may contribute to one's desire to start new business ventures. A recent study in the U.S. found that those who seek out additional information and options to find the best alternatives by applying a maximizing decision-making style had greater entrepreneurial intentions than those who settle for good enough choices, known as satisficers (Soltwisch et al., 2022). Behind these increased intentions, the maximizing trait is associated with greater innovativeness and an entrepreneurial orientation that allowed the potential entrepreneurs to identify more potential business opportunities in their environment. The decision strategy has even shown promise for new venture performance as entrepreneurs who maximize appear to build more entrepreneurial and market-oriented business that are more successful (Soltwisch, 2021).

Although this new trait appears promising as a method to study characteristics of entrepreneurs, it remains unknown whether maximizing may relate to entrepreneurial intentions across national contexts, where cultural factors and the availability of entrepreneurial opportunities may change the way people view entrepreneurial decisions. If maximizers are more inclined to identify and pursue new business opportunities in economies that do not foster and support entrepreneurial activity to the same extent as in the U.S., perhaps the search strategy could be a useful tool to help identify potential entrepreneurs and build entrepreneurial skillsets among those considering starting new ventures in countries desiring to create economic vitality through entrepreneurial means. By comparing students in the U.S. and Slovenia, the current study attempts to enhance generalizability of previous findings while understanding how cultural and economic factors may shape a person's decision to start new business ventures.

As social entrepreneurship becomes an increasingly popular means for governments to fill gaps in the social service sector, the current study attempts to understand how a person's decision-making style of maximizing or satisficing may relate to their intentions to start social enterprises. Because maximizers seek out the best for themselves and others, it remains unclear whether this tendency to seek out the best may apply to businesses aimed at helping others, such as in the non-profit sector or organizations with a social mission. At the individual level, a person's cultural perspective toward individualism or collectivism may affect the type of ventures people decide to start (Rantanen and Toikko, 2017); thus, the current study explores how a person's cultural orientation may affect the type of new businesses they start, whether they choose for profit businesses over social enterprises. By understanding the link between decision-styles, cultural orientation, and entrepreneurial intentions, the current study forms and tests a model of factors that may promote new business ventures across cultural contexts, with the goal of being able to better identify and train those who may be inclined to improve societal outcomes through entrepreneurial means.

1. How does maximizing or satisficing relate to entrepreneurial intentions and social entrepreneurial intentions?
2. How does a person's decision style relate to their cultural perspective, and does their cultural perspective affect their intentions to start for-profit or social enterprises?
3. Do these relationships hold across national contexts where the nature of entrepreneurial opportunities and cultural environment differ?

The next sections review work in maximizing, satisficing, cultural orientation, and entrepreneurial intentions as the theoretical basis for the research model. The model is tested with a sample of 188 students in the U.S. using multiple regression and mediation analysis. It is predicted that maximizers will display a more individualistic cultural orientation, and that those who apply an individualistic perspective will be more likely to start traditional entrepreneurial enterprises rather than ventures with a social mission. A second study with Slovenian students is conducted to compare how the relationships operate in a more collective culture where opportunities may be more limited. After describing the results, the discussion continues by linking the study's findings back to specific theoretical and practical applications, providing specific advice for managers and academics on how the model can be used to identify potential entrepreneurs in both collective and individualistic cultures.

Literature review

Maximizing and satisficing

Based on Simon's theory of bounded rationality, satisficing has been reconceptualized by Barry Schwartz et al. (2002) as a measurable trait in which individuals systematically differ in their tendencies to satisfice or maximize, with implications for a variety of personal and work-related behaviors and outcomes (see Schwartz et al., 2002; Schwartz, 2016 for review). The fundamental differences between maximizers and satisficers lies with their decision goals. Satisficers are content with good enough options while maximizers desire to find the best (Schwartz et al., 2002). To find better options, maximizers will continue to search for additional alternatives and compare options even after their criteria have been met. For example, when it comes to purchasing a new phone, maximizers will continue to look at different models to see if a better one may be available even after finding a phone that meets their requirements, say a large screen and good battery life. Alternatively, satisficers may end their search efforts after finding a phone that is "good enough" by obtaining one that meets their minimum criteria. Like personalities, these individual traits have been associated with a variety of personal and work outcomes (see Schwartz et al., 2002; Highhouse et al., 2008; Lai, 2010; Misuraca et al., 2015; Schwartz, 2016 and Misuraca and Fasolo, 2018 for review).

In general, maximizers consider more options, engage in greater comparisons of alternatives, and will spend additional time and effort to find the best (Schwartz et al., 2002; Schwartz, 2016). Due to the contemplative nature of the decision strategy, maximizing has been associated with ruminating over decisions (Schwartz et al., 2002; Paivandy et al., 2008) and counterfactual thinking associated with evaluating more positive and negative outcomes of various alternatives (Polman, 2010; Leach and Patall, 2013). This tireless process sometimes pays off when they find better outcomes. For example, maximizers who search for more job opportunities after graduation land positions with 20% higher starting salaries than those who satisfice (Iyengar et al., 2006). The authors attribute this to their greater efforts to seek out additional opportunities, even one's that were outside their major area of study. As a strategy, maximizing is more achievement oriented, aimed at finding the best possible outcomes both now and in the future (Bubić and Erceg, 2018). For example, to meet future goals, maximizers have greater savings intentions and will allocate more money toward savings (Zhu et al., 2017).

In the area of work, managers who maximize are more effective in leading their work teams by applying an internal locus of control (Soltwisch and Krahnke, 2017). The combination of searching more extensively together with their feelings of personal responsibility for decision outcomes allows those who maximize to lead their work teams more effectively. The rationale is that those who look for better outcomes may do so because they feel personally accountable for what happens and will put forth greater effort as a result. This aligns with their greater self-efficacy and higher perceived workload (Lai, 2010). Maximizers prefer to control the decision-making process (Sparks et al., 2012), and therefore may prefer entrepreneurship to traditional career alternatives. There is some evidence that they may be more effective entrepreneurs. For example, among entrepreneurs, maximizing decision styles have been associated with building more successful ventures. Interestingly, their maximizing efforts carried over to other aspects of the organization, allowing their new ventures to become more entrepreneurial and market oriented to better serve customers' changing needs (Soltwisch, 2021). However, after all the hard work to find the best, those who do better often feel worse about their decisions. Psychologically, maximizers exhibit more post-decision regret (Schwartz et al., 2002; Parker et al., 2007; Roets et al., 2012; Bruine de Bruin et al., 2016) and future oriented fear of missing out, or FOMO for short (Müller et al., 2020), as well as general unhappiness, perfectionism, depression and an overall lack of satisfaction and wellbeing in their lives (Schwartz et al., 2002).

This is especially true in cultures that emphasize personal choice as a means for happiness. In one study comparing adults from China, Western Europe, and the U.S., it was found that national culture may attenuate some of the negative psychological outcomes of the maximizing trait. Specifically, they found that maximizers who live in China did not see the same declines in their wellbeing as those living in Western Europe and in the U.S. (Roets et al., 2012). This was attributed to experiencing fewer instances of regret based on the cultural context of living in societies that do not emphasize access to options and personal choice as the primary means of attaining happiness.

This relationship did not pan out in the collective nation of Japan, however, with Japanese maximizers displaying even greater amounts of depression, unhappiness, and lack of satisfaction than those in the U.S. Because the macro-economic conditions in Japan may more closely resemble those in the U.S, the authors attributed these differences to cultural norms around opportunity, noting that "In American cultural contexts, having high standards typically means that a person expects to meet the high standards that the individual sets for him/herself." (Oishi et al., 2014 p. 19). Alternatively, in Japan, people's set high standards for themselves but fear that they may not be able to reach their ambitions (Heine et al., 1999). These somewhat contradictory results between China and Japan suggest that perhaps there are personal differences that may affect the way people's decision styles interact with their social-cultural context. Thus, there is a need to measure the relationship between maximizing or satisficing decision styles and cultural orientation at the individual level to see if the way individuals think about choice relates to how they interact and connect with others. Therefore, the current study aims to answer the call for a greater understanding of the cultural influences on maximizing or satisficing tendencies (Henrich et al., 2010; Oishi et al., 2014).

Cultural orientation

Based on Hofstede's cultural dimensions of individualism and collectivism (Hofstede, 1980, 2011) used to describe differences at the national level, individualism and collectivism represent differences in the way people view close knit bounds with others, whether they identify as part of a larger group, how they prioritize group goals over their own, and their desires for personal achievement (Parkes, 2000). Recognizing that individuals who live in national contexts often vary in their cultural perspectives, Triandis and Singelis (1998) developed a measure aimed to inform scholars and professionals on how to recognize differences in personal cultural orientations toward individualism or collectivism (Triandis and Singelis, 1998). If compared to zoology, individualism (I) and collectivism (C) represent the broadest division with a myriad "species" of each, described by culture-specific attributes (Singelis et al., 1995). A more sophisticated method of tempering cultural knowledge with demographic and life experience information is needed to differentiate people within one cultural background from each other. Thus, the attributes that matter to the individual representative of a national sample, are measured by the subjective instrument SINDCOL, and they can be best understood as fluctuating tendencies that might, or might not, be manifested in a particular individual.

Such differences proved significant in predicting specific behaviors and work-related outcomes. For example, individualism is associated with workplace traits of independent

decision-making and performance; whereas collectivism is linked to interdependence, comfort, and harmony with others in the workplace (Singelis et al., 1995). For these reasons, individualism has predicted organizational citizenship behavior aimed at increasing status, while collectivism tends to encourage prosocial behavior that benefits others and the organization itself (Lee et al., 2022). Similarly, individualism has been associated with the desire for powerful positions within a company, such as in leadership, while those who take a more collective perspective do not view prestige as important to their career (Parkes, 2000). In addition, collectivistic social behaviors are best predicted by norms, obligations, and duties; whereas, individualists are linked with competition, higher levels of self-reliance (Triandis, 1995), higher level of risk-taking (Chanda and Unel, 2021), and lower level of uncertainty avoidance (UAI; Hofstede, 2011). Individualistic work-related outcomes on an individual level are also innovation, proactive initiatives, resourcefulness, achievement and goal orientation (McClelland et al., 1953; Dimitrov, 2005). Further SINDCOL research (Gürhan-Canli and Maheswaran, 2000) offered value to advertising and consumer behaviors. For example, collectivistic representatives value the superiority of the in-group product.

Among U.S. populations, it was found that individualism was associated with people who were younger; had grandparents from western cultures; have traveled overseas alone or have lived abroad for more than 6 months; have a job that allows one to work without collaboration or in company of others; as well as value their own reasoning, own decision-making, and personal privacy (Triandis and Singelis, 1998). The authors of this personalized cultural measure recognized that the differences could be used to educate individuals on how their own cultural perspectives and the perspectives of people they work with can affect various workplace interactions and behaviors, noting that "training an individual to recognize such variations, within culture, will be of great value" (Triandis and Singelis, 1998, p. 37). The benefits of such knowledge lie in being able to understand the motivation of one's colleagues in a global business environment. As a result, diversity training in the US was suggested as a direct application of the instrument.

Cultural orientation and maximizing or satisficing decision-making styles

One of the more profound discoveries related to the way we approach decisions is in how these styles may affect people differently based on cultural contexts. Despite sometimes doing better due to their extensive search strategy, maximizers often feel worse about their decisions, reporting greater instances of regret and depression, as well as being less happy, optimistic, and satisfied in their lives (Schwartz et al., 2002; Iyengar et al., 2006; Parker et al., 2007; Chang et al., 2011; Purvis et al., 2011). Interestingly, the very process that encourages maximizers to explore additional options to find the best becomes a source of unhappiness as they ruminate over past decisions by thinking about what they could have done better and consider their outcomes in relative terms to others, especially with those who are doing better than them (Schwartz et al., 2002; Chan, 2021).

Thus, their notion of what is considered as "the best" is tied to social comparisons. For example, through extensive search, maximizers have been reported to land better jobs after graduation than those who satisfice, yet they feel worse about those better positions because their extensive search process allowed them to see all the opportunities they missed along the way. Additionally, they viewed their results comparatively to others who had been more successful in their job search (Iyengar et al., 2006). This paradoxical finding, that maximizers feel worse despite doing better, appears to depend on cultural factors, as cross-cultural comparisons have found that maximizing has a more negative impact on well-being in societies where choice is abundant, highly valued, and viewed as the primary means for achieving success and happiness, such as in the U.S. (Roets et al., 2012). Alternatively, In China, where choice is more limited and less valued as a means for obtaining happiness through personal achievements, those who maximize did not report the same decreases in well-being associated with ruminating over decisions as those who live in the U.S. or Western Europe (Roets et al., 2012).

Although national culture appears to attenuate some of the negative psychological effects of maximizing, there are heterogeneous cultural orientations that exists within any predominant culture, and many different cultural perspectives within national boundaries; therefore, there has been a call for measuring cultural perspectives at the individual level (Triandis and Gelfand, 1998; Yoo et al., 2011; Kurtiş and Adams, 2013). Support for heterogeneity among cultural values has been found in various studies (Dockens, 2009; Hatt, 2009; Yolles and Fink, 2009; Fatehi et al., 2015, 2018). Especially in the U.S., where people who come from diverse cultural/ethnic backgrounds display different views toward collectivism and individualism despite living in a predominantly individualistic culture (Vandello and Cohen, 1999; Chiou, 2001). Although it has been inferred that those who maximize or satisfice would act differently across cultural contexts, the relationships between cultural dimensions and maximizing or satisficing decision styles has not been measured directly. Additionally, it remains unknown how an individual's tendencies to maximize or satisfice may shape their personal views toward individualism. To fill these gaps, the current study investigates the relationship between maximizing and satisficing and individual cultural orientation in the U.S. using the Triandis and Singelis (1998) SINDCOL instrument. A second study is then conducted in Slovenia to see if the relationships operate differently across national contexts.

Entrepreneurial decision-making

"Entrepreneurship, in its narrowest sense, involves capturing ideas, converting them into products and, or services and then building a venture to take the product to market" (Johnson, 2001, p. 138). Researchers have investigated numerous trait variables that have been linked to entrepreneurial intentions and behavior,

finding that entrepreneurs are generally risk takers (Antoncic et al., 2018) who apply an individualistic approach when working with others (McGrath et al., 1992); they show resilience that allows them to surmount obstacles (Vizcaíno et al., 2021), and prefer to take action rather than be complacent (Lee et al., 2021), using their interpersonal skills to work with others to get things done (Clark, 2008). Although there are many traits associated with potential entrepreneurs, there is no archetypal entrepreneurial since the processes and skills vary greatly from one entrepreneurial venture to the next, and people may choose to pursue a career in entreprenership for a variety of reasons.

As a rapidly growing field, social entrepreneurship attempts to meet the needs of society through innovative solutions (Urban and Kujinga, 2017). The rise of social entrepreneurial education and important role that social entrepreneurs play in implementing social causes has become widely accepted (Stecker, 2014; Stoica et al., 2020), establishing a need to identify what may encourage individuals to pursue social change or meet societal needs by exploiting new opportunities. Social entrepreneurship has been defined as the combination of resources arranged to produce either new services, products, or organizations, with the intent of exploiting opportunities to accelerate social change, meet social needs, or increase social value (Kedmenec and Strašek, 2017).

Social entrepreneurship focuses on the "social" aspect of entrepreneurial activities, and therefore can be considered as a subcategory of entrepreneurship, with many overlapping activities (Tan et al., 2020). The main difference between social and traditional entrepreneurs lies with their intent to solve social problems or carry out a social mission (Zahra et al., 2008), and thus they tend to exhibit high levels of empathy and have a strong sense of moral obligation (Hockerts, 2017). Because the growth of entrepreneurship depends on the number and quality of entrepreneurs (Krueger, 2003), it follows that increasing the number of social entrepreneurs is necessary to expand the development of social entrepreneurial ventures. Perhaps looking at cultural differences in the way people approach entrepreneurial decisions may hold important clues for how we can identify and train individuals who are apt to find innovative solutions that solve social problems.

Researchers have long discussed the influence of cultural dimensions on personal choice. As an underlying system of values, culture shapes the way people think about and engage in behaviors (Mueller and Thomas, 2001). As such, culture has been seen as a motivating force for new venture creation, which serves to stimulate economic growth through new job creation. Based on the theory of social legitimation and moral approval, entrepreneurship rates are higher where social status elevates entrepreneurs as a desirable occupation (Etzioni, 1987). Among developed economies, there appears to be a positive relationship between individualistic cultures and entrepreneurial activity, as measured by new business starts according to the Global Entrepreneurship Monitor (Pinillos and Reyes, 2011). Fueling this entrepreneurial potential, it has been argued that individualistic cultures create more supportive environments that value pursuing personal goals through entrepreneurial means (Liñán et al., 2016). Along with the high need for achievement through the pursuit of personal rewards, having an internal locus of control and an innovative mindset may create the perfect recipe for those who desire to start new enterprises (Mueller and Thomas, 2001; Pinillos and Reyes, 2011).

Yet, an individualistic mindset may only benefit new business starts in economies that have a level of economic development conducive to facilitating personal entrepreneurial endeavors and some have argued that collective cultures may be more favorable to entrepreneurs in less developed economies, where there can be greater cooperative support for such an undertaking (Pinillos and Reyes, 2011; Zeffane, 2014). At the national level, the connection between individual – collective cultures and entrepreneurship has seen varied results (Hunt and Levie, 2002; Pinillos and Reyes, 2011). The mixed results have been attributed to an oversimplification of the way in which national culture may influence entrepreneurial decisions at the personal level (Wennberg et al., 2013). Similarly, at the national level, there appears to be no clear relationship between the individualism - collectivism cultural dimensions and social entrepreneurial intentions (Kedmenec and Strašek, 2017). Intriguingly, there have only been a few studies measuring the relationship between cultural perspectives and entrepreneurial intentions at the individual level, and these have been done outside the U.S. in Spain (Liñán et al., 2011), Finland (Rantanen and Toikko, 2017), United Arab Emirates (Zeffane, 2014), and Pakistan (Farrukh et al., 2019). There have not been any studies exploring how personal cultural views may shape social entrepreneurial intentions. Therefore, there is a need to measure the relationship between cultural orientation and entrepreneurial intentions at the individual level in the U.S. and in Slovenia to see if personal cultural views may shape individuals' propensity to start new business ventures, and the type of ventures they form.

Model construction and theoretical hypothesis

Maximizing or satisficing and cultural orientation

Triandis and Gelfand (1998) argue that, within any culture, individualism and collectivism can exist simultaneously within any individual and may be different than the prevailing cultural norms. Thus, measuring culture at an individual level may offer more depth to understanding cultural perspectives that exists within individuals who reside within cultures that may take on prevailing norms, and how those perspectives may be linked to personal trait variables. Because maximizing is associated with wanting to be the best through individual choices (Schwartz et al., 2002) and controlling the decision process (Sparks et al., 2012), it may lend toward a mindset that views oneself more independently rather than connected with others. Maximizers view themselves

comparatively to others, trying to outdo those who are doing better than them (Schwartz et al., 2002; Weaver et al., 2015). These social comparisons push them to apply more effort into achieving their goals and attaining superior outcomes (Chan, 2021). Others have found that they are more achievement oriented, focused on outcomes rather than the process (Hsieh and Yalch, 2020), and will pursue high value but effort consuming opportunities (Luan et al., 2018). In a study of self vs. other decisions, maximizers sought out the best options for themselves and others, whereas satisficers prefer the best options for others but did not put forth the same effort for themselves (Luan et al., 2018), suggesting that they may have greater concern for group goals over their own. Similarly, maximizers are more concerned with how their outcomes compare to others than their objective results (Weaver et al., 2015). Overall, it appears that maximizers relate to others through a competitive lens, basing their search strategies around external validation (Iyengar et al., 2006; Parker et al., 2007; Luan et al., 2018) social comparisons (Schwartz et al., 2002; Polman, 2010), and being the best among their peers (Weaver et al., 2015; Chan, 2021). For this reason, they are more likely to spend greater effort to search for the best in public vs. private domains (Luan et al., 2018), where the results of their decisions become part of their social status.

As defined by Triandis (2018, p. 2), Individualism is "a social pattern that consists of loosely linked individuals who view themselves as independent of collectives; are primarily motivated by their own preferences, needs, rights, and the contracts they have established with others; give priority to their personal goals over the goals of others; and emphasize rational analyses of the advantages and disadvantages to associating with others." Because maximizers are more concerned with status and view themselves on a comparative basis with others rather than seeing themselves as part of a group of equals, they may have a more individualistic cultural perspective. For example, maximizers are more concerned with status in consumer decisions (Brannon and Soltwisch, 2017) and attempt to outdo their peers by searching for better job opportunities (Iyengar et al., 2006). As defined by Waterman (1984), normative individualism relies on freedom of choice and personal responsibility, respecting the integrity of others, and living up to one's potential. It has been associated with the values of demonstrating one's competence to others through achievement and displaying successes through social recognitions (Nelson and Shavitt, 2002). Underlying the maximizing trait is the assumption that making good decisions is a means for achieving superior results, which may further one's goals toward achieving their objectives. Maximizers are achievement oriented (Peng et al., 2018) and expect better outcomes due to their intensive search strategies (Iyengar et al., 2006; Benjamin et al., 2014). Based on aspects of maximizing related to self-other decisions, their use of social comparisons as a means for status and having a high need for achievement through effortful decision search and comparative analysis, it is predicted that maximizers will be more individualistic in their cultural perspective.

> *H1*: Those who maximize their decisions will have a more individualistic cultural view.

Cultural orientation and entrepreneurial intentions

Because of its relation to autonomy and independence as defined by the Hofstede's (1980) model, individualism has been associated with entrepreneurial intentions in a variety of settings (Mitchell et al., 2000; Liñán and Chen, 2009; Siu and Lo, 2013; Liñán et al., 2016). For various reasons, individualism fits the profile of an entrepreneur. In individualistic cultures, people display a high need for achievement and are encouraged to pursue individual goals over group goals (Pinillos and Reyes, 2011). They foster innovation while applying an internal locus of control (Mueller and Thomas, 2001). By awarding social status to those who exhibit new discoveries, individualism has been connected to long-term economic growth and innovativeness (Gorodnichenko and Roland, 2012). It has been argued that entrepreneurial activity is more valued and encouraged in individualistic cultures through a more supportive environment (Liñán et al., 2011). For these reasons, there has been some support for the relationship between individualistic cultures and entrepreneurial behavior (McGrath et al., 1992; Mueller and Thomas, 2001; Wennekers et al., 2002; Pinillos and Reyes, 2011; Liñán et al., 2016).

Yet, the national level data tends to indicate that this relationship may only hold in highly developed economies. Based on Global Entrepreneurship Monitor data, a study of 52 countries found that in nations with low or medium economic development, individualism did not have any effect on entrepreneurial activity (Pinillos and Reyes, 2011). The authors conclude that the needs of self-fulfillment and personal achievement may only be satisfied when economic conditions can support an individual's personal efforts toward entrepreneurial endeavors. Others have found that at the national level, culture explains only a small portion of the variance in individual attitudes toward entrepreneurship and entrepreneurial activity (Hunt and Levie, 2002). Because these studies assume that everyone within a nation takes on the predominant cultural perspective, it has been argued that they may be missing individual nuances in cultural views that shape personal attitudes toward entrepreneurship that extend to new venture decisions (Rantanen and Järveläinen, 2016).

Surprisingly, there have only been a few studies investigating how personal cultural views shape entrepreneurial intentions. In a comparison of various regions of Spain, Liñán et al. (2016) identified that when a person is more individualistic than the prevailing cultural norms in the region, they tend to show greater intentions toward entrepreneurship (Liñán et al., 2016). In Finland, it was found that both individualism and collectivism was associated with greater entrepreneurial intentions (Rantanen and Järveläinen, 2016). The authors note that social bonds among those in collective cultures can encourage entrepreneurship, especially in lower economic development regions. Research in

Pakistan has found that individualistic personal cultural views were strongly associated with new venture intentions when people perceive that entrepreneurship is within their reach and when they have a positive attitude toward entrepreneurship (Muhammad et al., 2019). Interestingly, similar to the study in Finland, Pakistani students who were more collectivist in their views, were more interested in entrepreneurship when cultural norms supported it. This suggests that the level of societal support for new business ventures can be an influential factor, especially for those who live in collective cultures.

Yet, in the U.S. it remains relatively unknown how personal cultural views affect entrepreneurial intentions. As a nation, the U.S. is generally supportive of individual achievements through entrepreneurial means and has developed an economic model based on growth through new business innovation. National data supports this assertion as it is ranked 12th globally based on the Global Entrepreneurship Monitor (GEM) data for favorable entrepreneurial environments. Pinillos and Reyes (2011) similarly found a strong correlation between individualistic national culture and entrepreneurial activity in the U.S. according to GEM data, noting that the relationship between individual culture and entrepreneurship applied best to nations that have a high enough level of economic development to support individual pursuits toward achieving entrepreneurial goals. According to Hofstede's research, the U.S. has an individualistic culture that promotes individuality and decision-making autonomy as a means for achieving success.

However, others have argued for a more nuanced approach to measuring cultural differences among citizens in the U.S. to account for the wide variety of cultural backgrounds and perspectives based on the country's history of bringing together diverse racial and ethnic populations (Triandis and Gelfand, 1998). For example, these personal differences in individualistic perspective become apparent when comparing states within the U.S. that have different views toward individualism and collectivism (Vandello and Cohen, 1999). Additionally, there may be generational differences as levels of individualism are rising among young adults who are less engaged in community life as those of past generations (Nezlek and Humphrey, 2021). However, for entrepreneurs it appears that individualism may be beneficial to well-being. For example, Atalay and Tanova (2021) found that entrepreneurs experience greater well-being in individualistic cultures due to having more autonomy to make decisions in a way that produces desirable results. Entrepreneurs are driven by independence and the freedom to make their own decisions (Douglas and Shepherd, 2002; Shepherd et al., 2015). In cultures that promote this independence, such as the U.S., it is conceivable that those who have a more individualistic cultural perspective may see entrepreneurship as a desirable career choice to achieve personal goals. Therefore, it is predicted that an individualistic cultural perspective among individuals in the U.S. will be positively related to entrepreneurial intentions.

> *H2*: Individualism will be positively related to entrepreneurial intentions.

Through the discovery and exploitation of opportunities, social entrepreneurs find their purpose in serving society rather than their own interest (Mair and Noboa, 2003, 2006). Although there has been little research on how cultural orientation may impact social entrepreneurial intentions directly, a study comparing the U.S. with China found that attitude toward entrepreneurship was a more important predictor of social entrepreneurial intentions in the U.S. than in China (Yang et al., 2015). The authors attribute this to the individualistic nature of the culture in the U.S., where people are more likely to be motivated by their own interests and attitudes. In line with other studies in collective societies, they found that societal norms toward entrepreneurship were more influential in predicting entrepreneurial intentions in China (compared to the U.S.) based on the role that society and significant others may play in supporting and encouraging social entrepreneurship to serve others. At the personal level, in societies that support personal achievements over group outcomes, it is possible that individualistic values would be less aligned with the collective goals of social enterprises. Therefore, it is predicted that individualism will be negatively related to social entrepreneurial intentions.

> *H3*: Individualism will be negatively related to social entrepreneurial intentions.

Maximizing and entrepreneurial intentions

According to the Theory of Planned Behavior (Ajzen, 1991), entrepreneurial intentions are indicative of the effort an individual is prepared to carry out to start a new business venture, which has been a reliable predictor of entrepreneurial behaviors (Van Gelderen et al., 2008; Wu, 2009). For example, studies have found that personality traits such as need for achievement (Tong et al., 2011), self-efficacy (Zhao et al., 2005), internality of control (Tentama and Abdussalam, 2020), tolerance for risk (Segal et al., 2005) and conscientiousness (Engle et al., 2010) are related to increased intentions to start new ventures. Because maximizers are persistently comparing options to find better alternatives (Schwartz et al., 2002), it makes sense that recent studies have begun to investigate the role of these decision styles in the areas of innovation and entrepreneurship.

Among entrepreneurs, those who maximize their decision efforts tend to build more entrepreneurial and market-oriented firms that can better meet changing market demands, resulting in superior financial performance (Soltwisch, 2021). Given that maximizers persistently seek out better alternatives (Schwartz et al., 2002), prefer to control the decision-making process (Sparks

et al., 2012), are more confident in their abilities to lead, and will put forth additional effort to achieve superior results as executives (Lai, 2010), they share many of the same traits that exemplify the entrepreneurial profile. Maximizers tend to feel more personally responsible for the outcomes of their decisions (Schwartz et al., 2002). In societies that view success as the result of personal achievements through good decision-making, such as the U.S., maximizers tend to be extra critical of themselves because they compare their outcomes with those of others (Roets et al., 2012). In individualistic cultures, where personal achievements through independent efforts are revered, and entrepreneurship is promoted as a path for obtaining superior personal and financial rewards, maximizers may be more likely to view entrepreneurship as a means to achieve greater relative success.

Recently, it has been found that maximizers in the U.S. have a more innovative mindset and are more entrepreneurially orientated, which makes them more likely to see entrepreneurship as a viable career path (Soltwisch et al., 2022). It makes sense that entrepreneurship may be a viable means for achieving better results for those who maximize, especially in the U.S., where the economic environment may favor those who take steps to create a better future for themselves. Therefore, in line with existing work, it is predicted that maximizing will increase individual's intentions to start new business ventures in the U.S.

> *H4*: Maximizing will be positively related to entrepreneurial intentions in the U.S.

Beyond optimizing outcomes for themselves, maximizers also attempt to find better solutions for others and will encourage others to maximize their decision efforts (Luan et al., 2018). In doing this, they will encourage those around them to pursue highly valued goals that require significant effort. The goals of social entrepreneurs often require considerable effort, and it is important for entrepreneurs to build support for others to help reach the venture's goals. Maximizers are more innovative and identify additional opportunities for new businesses in their environment (Soltwisch et al., 2022). They persistently seek out additional information and options to find better solutions. It is possible that they would apply this innovative mindset to identifying social problems that may create entrepreneurial opportunities. Maximizers are more likely to view ethically questionable situations as being immoral based on their absolutist ideology (Soltwisch et al., 2020). This principles-based view considers that ethical standards should be applied uniformly across all people and may be a basis for addressing the concerns of underserved populations. Because maximizers tend to be more attuned to see ethical issues as immoral and may identify more opportunities to solve those problems, the current study aims to investigate whether maximizing may increase an individual's intentions to start socially oriented businesses with a mission to serve others. Because the relationship between maximizing and social entrepreneurial intentions has not been previously tested, this will provide a first look into how one's search for the best may relate to solving social problems through entrepreneurial means.

> *H5*: Maximizing will be positively related to social entrepreneurial intentions in the U.S.

To recap the discussion thus far, it was hypothesized that maximizers will have a more individualistic view. Further it was posited that those who are more individualistic will have greater entrepreneurial intentions but lower intentions to start social enterprises in the U.S. Thus, taken together with hypotheses H4c and H5C, individualistic cultural views may mediate the relationships between maximizing and the dependent variables of entrepreneurial intentions and social entrepreneurial intentions. Therefore, the proposed research model can be found in Figure 1 below.

Methods and results

Two hundred and five students taking upper-level business courses at a university in the Western U.S. completed a survey measuring the focal variables in the study (45% female, mean age = 22.22). Participants completed a questionnaire using Qualtrics survey software. In exchange for their participation, participants were offered nominal extra credit. Among those who completed the survey, 188 students provided valid data. Seventeen respondents were removed due to missing data on either the independent or dependent variables. To measure culture, 12 items measuring individualism were used from the SINDCOL instrument (Triandis and Singelis, 1998, p. 42–47; Cronbach's $\alpha = 0.67$). Although the reliability was low, it was similar to that found by Singelis (1994), with Cronbach's $\alpha = 0.69$ in the first study and.70 in the second. Questions measure various aspects of individualism such as, "Would you say that most of the time you do "your own thing" paying no attention to whether or not it fits customs and "proper" behavior? Respondents are asked to rate their behavior on a 10-point scale, with a 10 as most likely.

Entrepreneurial intentions were measured using Liñán and Chen's (2009) six-item scale (Cronbach's $\alpha = 0.96$). Examples of items include: "I am ready to do anything to be an entrepreneur"; and "I have the firm intention to start a firm someday." Hockerts (2017) Social Entrepreneurial Intention Scale was used to measure intentions to start ventures with social missions (Cronbach's $\alpha = 0.85$). The scale asks questions such as, "I expect that at some point in the future I will be involved in launching an organization that aims to solve social problems"; and "I have a preliminary idea for a social enterprise on which I plan to act in the future."

To measure the independent variable (maximizing), participants completed the nine-item Maximizing Tendency Scale (MTS; Highhouse et al., 2008; Cronbach's $\alpha = 0.97$). Some examples of the Maximizing Tendency Scale items include: "My decisions are well thought through"; "I never settle"; and "I am a maximizer." Finally, students completed demographic variables

and described their ethnic background by answering the question, "what is the most important source of your ethnic background"? Participants selected from 17 ethnic backgrounds identified by Triandis and Singelis (1998) representing regions from around the world. The largest three ethnic backgrounds represented in the U.S. sample were Western European (51%), Northern European (25%), and Mexico (9%). Table 1 below shows the correlations among focal variables in the study.

To recap the predictions, it was posited that maximizers will have a more individualistic view. Further it was expected that individualism will have a positive relationship to entrepreneurial intentions and a negative relationship with social entrepreneurial intentions. Therefore, taken together, an individualistic cultural view may mediate the relationships between maximization and the dependent variables entrepreneurial intentions and social entrepreneurial intentions. The control variables of age, gender, and ethnic background were included in all regressions to account for variations in cultural orientation and entrepreneurial intentions due to gender, age, or ethnicity. In the current sample, men were significantly more likely to be individualist and showed significantly higher entrepreneurial intentions.

To test the relationship between maximizing and individualistic views, individualism scores were regressed on participants' maximization scores. As expected in H1, results indicate that those who maximize are significantly more individualistic in their cultural view [b = 3.56, $t(184) = 3.30$, $p < 0.01$]. The relationships between individualism and the dependent variables entrepreneurial intentions and social entrepreneurial intentions (H2, H3) was tested using multiple regression analysis in SPSS, finding that individualism was significantly related to higher entrepreneurial intentions [b = 0.03, $t(184) = 3.26$, $p < 0.01$], but unrelated to social entrepreneurial

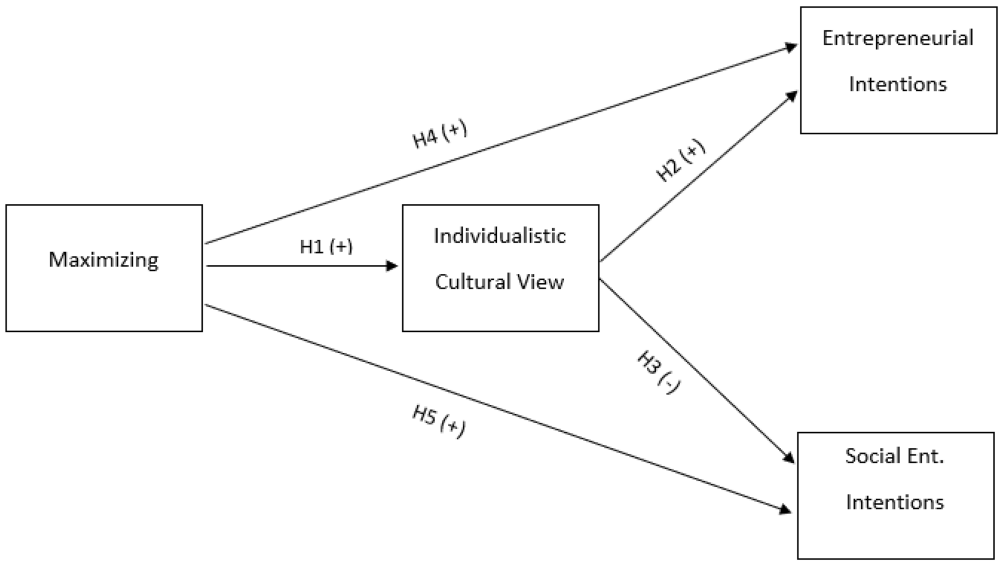

FIGURE 1
Research model.

TABLE 1 Correlations among variables.

		Means	Range	St. Dev.	1	2	3	4	5	6	7
1	Maximizing	5.37	1–7	0.86	1.						
2	Individualism	5.48	2–8.6	1.08	0.23**	1.					
3	Ent Intentions	4.14	1–7	1.74	0.29**	0.26**	1.				
4	Soc Ent. Intentions	4.29	2–7	0.89	0.28**	0.11	0.38**	1.			
5	Age	22.22	18–72	4.9	−0.07	0.06	−0.04	0.04	1.		
6	Gender	1.46	1–2	0.5	0.02	−0.17*	−0.23**	−0.16*	−0.15*	1.	
7	Ethnic Background	5.74	1–7	0	−0.03	0.0	−0.11	−0.13	−0.01	0.08	1.

$N = 188$. Gender (1 = male, 2 = female).
**$p < 0.01$.

TABLE 2 Regression results for maximization and individualism.

Independent Variables	Maximizing							Individualism			
Dependent variables	Individualism		Entrep Int		Soc Entrep Int			Entrep Int		Soc Entrep Int	
	β	*t*	β	*t*	β	*t*		β	*t*	β	*t*
Age	0.0.01	0.78	−0.02	−0.8	0.01	0.6	Age	−0.03	−1.22	0.01	0.24
Gender	−0.37	−2.37	−0.84**	−3.48	−0.28**	−2.17	Gender	−0.69**	−2.75	−0.24	−1.79
Ethnicity	0.01	0.27	−0.08	−1.24	−0.05	−1.58	Ethnicity	−0.09	−1.39	−0.06	−1.66
Maximization	0.29**	3.3	0.61**	4.42	0.3**	4.18	Individualism	0.37**	3.26	0.07	1.24
Model R^2	0.09		0.16		0.13		Model R^2	0.12		0.05	
Adjusted R^2	0.07		0.14		0.11		Adjusted R^2	0.1		0.03	
Model F	4.27**		8.57**		6.47**		Model F	6.19**		2.33	

$N = 188$. Gender (1 = male, 2 = female).
**$p < 0.01$.

intentions [b = 0.006, $t(184) = 1.24$, $p = 0.22$]. Thus, hypothesis H2b was supported, while H3 was not. Finally, the dependent variables of entrepreneurial intentions and social entrepreneurial intentions were regressed on maximization scores to test hypotheses H4c and H5, finding that maximization significantly increased entrepreneurial intentions [b = 0.61, $t(184) = 4.42$, $p < 0.01$] and social entrepreneurial intentions [b = 0.3, $t(184) = 4.42$, $p < 0.01$], supporting hypothesis H4 and H5. See Table 2 displaying regression results for the independent variables maximizing and individualism on the dependent variables.

To test the mediation effects of individualism on the relationship between maximizing and entrepreneurial intentions and social entrepreneurial intentions, model 4 of the bootstrapping process described by Hayes and Preacher (2014) was used with 5,000 samples. The control variables of age, gender, and ethnic background were included as covariates (Figure 1). For the maximizing - individualism – entrepreneurial intentions mediation model, the first path (H1) showed that maximizing was significantly related to individualism [b = 0.29, $t(180) = 3.29$, $p < 0.01$]. The second path (H2) found that individualism was significantly related to entrepreneurial intentions [b = 0.26, $t(180) = 2.38$, $p < 0.05$]. And the last path (H4) showed that maximizing was significantly related to entrepreneurial intentions [b = 0.52, $t(180) = 3.77$, $p < 0.01$]. The bootstrapping results indicate that individualism fully mediated the path between maximization and entrepreneurial intentions (b = 0.61, $CI_{95\%}$ exclusive of 0 [0.009, 0.182]).

For the second model testing the maximizing – individualism – social entrepreneurial intentions relationship, the first path found that maximizing was significantly related to individualism [b = 0.29, $t(180) = 3.29$, $p < 0.01$]. The second path was not significant [b = 0.01, $t(180) = 0.30$, $p = 0.76$], indicating that individualism was not related to social entrepreneurial intentions. Thus, the mediation of individualism on the relationship between maximizing and social entrepreneurial intentions was not supported (b = 0.30, CI_{95} [−0.03, 0.05]). See Figure 2 displaying the mediation results.

Study 2

A second study was conducted in Slovenia to test how the relationships would operate in a more collectivistic national culture. With the goals of expanding generalizability and identifying boundary effects for the proposed relationships, this study serves to answer a call for more cross-cultural comparative research on the antecedents of entrepreneurial intentions (Antoncic and Hisrich, 2001; Liñán and Chen, 2009). In 2020, Slovenia was ranked 12th on the economic complexity index, just behind the 9th ranked U.S. according to EOC data which compiles a variety of data points to measure the productive capabilities of large economies (OEC, 2020). Thus, similar to the U.S., the Slovenian economy can support a high level of economic activity. Slovenia has successfully transitioned from a socialist country to a market-based economy (Hisrich et al., 2003) and the government has actively supported entrepreneurship as a means for promoting economic development. Yet, the transition has been slow to impact new business starts, with a total entrepreneurial activity (TEA) score of around 6.66, according to the most recent Global Entrepreneurship Monitor (GEM) data (GEM, 2020/2021 report). In comparison, the U.S. has a total entrepreneurial activity (TEA) score of 23.06 (GEM, 2020/2021 report).

It is true that the U.S. and Slovenian economies share some commonalities despite their differences in size, however, the distinct economic and cultural history of Slovenia may shape the way people perceive entrepreneurship. Historically, Slovenians have adopted a predominantly collective culture, and economic decisions were based on mutual benefit rather than personal gains. For example, Musek (2004) showed that people in Slovenia ranked socially based values as their top priority. Slovenian's generally carry strong bonds with their family, have traditional values, and prefer to remain rooted near their homes, often living with several generations in one household (Penger et al., 2015). Based on Hofstede's data, Slovenia has an individualism score of 27, suggesting a more collectivist society. In comparison, the U.S. marks a 91 on individualism (Hofstede Insights Organisational Culture Consulting, 2022).

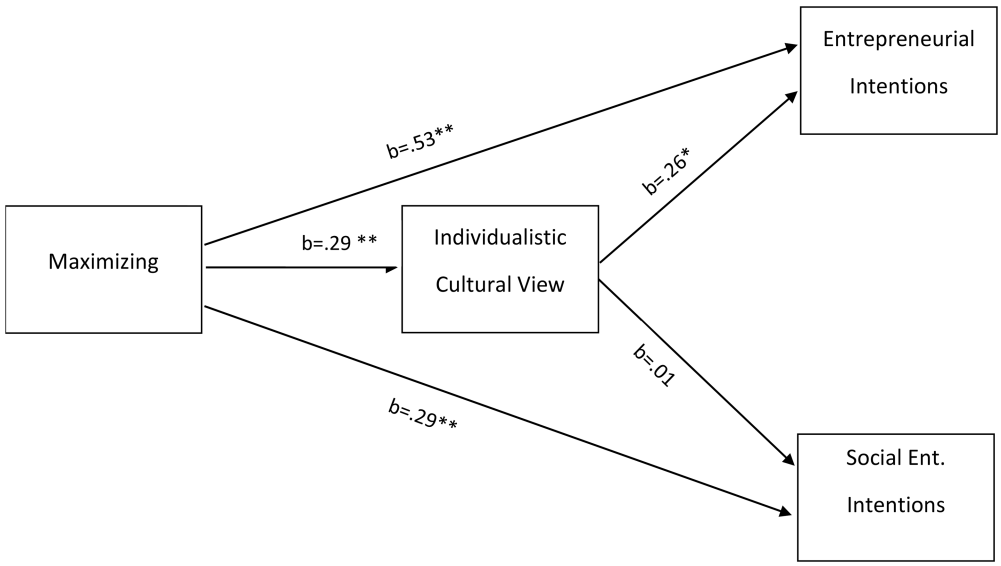

FIGURE 2
Mediation model. *p <.05; **p <.01.

Because Slovenia has an advanced level of economic development, yet a unique historical and cultural perspective relative to the U.S., it is an ideal place to compare students' perceptions of entrepreneurial opportunities based on differences in their cultural orientations and decision styles. Additionally, the second study investigates further distinctions in cultural dimensions that may be related to maximizing and satisficing. In study 2 cultural orientation is measured using Triandis and Gelfand's (1998) measurement of vertical and horizontal individualism and collectivism, which identifies two individualism dimensions (vertical and horizontal) and two collectivism dimensions (vertical and horizontal). Building on Triandis' (1995) recognition that a distinction between the vertical and horizontal I and C also needs to be made, the Study of Triandis and Gelfand (1998) was pivotal in introducing the idea that being just a little individualist (I.) and a little collectivist (C.) is not enough for a person from a certain national culture. Rather, there is another level of analysis – personal, individual, identity crucial, and unique. This is the horizontal/vertical (H/V) aspect of the individual cultural differences.

These distinctions are defined by Singelis et al. (1995) as (1) horizontal individualism is a cultural pattern where the self is autonomous and independent from others, but yet equal in status to them – perceived as same; (2) Vertical individualism is a cultural pattern where the self is autonomous, but different from others. Inequality and competition are the expectation in this cultural orientation; (3) Horizonal collectivism (H-C), is a cultural pattern where the self is merged with the members of an in-group and personal identity is perceived as part of the identity of an in-group; (4) And vertical collectivism (V-C) is a cultural pattern where the self is still a part of the in-group, but not the same and not equal to the other selves.

Measuring vertical and horizontal dimensions of individualism may reveal whether maximizing is more related to status distinctions (vertical individualism) or the desire to make decisions autonomously (horizontal individualism). The horizontal and vertical collectivism dimensions will allow for the distinction between seeing oneself as part of a group and identifying with the group's goals (horizontal collectivism) or being part of a group but not prioritizing group goals (vertical collectivism). The independent variable (maximizing) and dependent variables (entrepreneurial intentions, social entrepreneurial intentions) remain the same as in study 1 to cross-validate the findings in a different national context.

Sample and measures

Students attending the University of Ljubljana and the University of Primorska in Slovenia completed a survey measuring the studied variables. Students were sent a link to complete the survey using the Qualtrics survey software. Students were asked to select the country where they were born or spent the greatest part of their formative years 1–10. Out of 152 students who completed the questionnaires, 107 indicated they were from Slovenia or spent their formative years there, and thus were included in the analysis. Triandis and Gelfand (1998) developed a 16-item scale measuring 4 items for each cultural orientation: vertical individualism (Cronbach's $\alpha = 0.88$ in current study), horizontal individualism (Cronbach's $\alpha = 0.82$ in current study), vertical collectivism (Cronbach's $\alpha = 0.81$ in current study), and horizontal collectivism (Cronbach's $\alpha = 0.81$ in current study). Consistent with study 1, the Maximizing Tendency Scale (MTS; Highhouse et al., 2008; Cronbach's $\alpha = 0.79$), Entrepreneurial

Intentions Scale (Liñán and Chen, 2009; Cronbach's α = 0.97), and Social Entrepreneurial Intention Scale (Hockerts, 2017; Cronbach's α = 0.91) were used to measure maximizing, entrepreneurial intentions, and social entrepreneurial intentions, respectively.

Results

Multiple regression analysis was used to test the relationships proposed in study 1; however, this time the relationships between maximizing and two individualism and two collectivism dimensions of culture were considered. The control variables of age and gender were included in the regressions to account for any variations in the entrepreneurial intentions that may be related to these factors. To test the relationship between maximizing and vertical and horizontal individualism, respondents vertical individualism scores were regressed on their maximization scores [b = 0.83, $t(104) = 5.8$, $p < 0.01$], suggesting that maximizing was significantly related to higher vertical individualism. Similarly, maximizing was significantly related to higher horizontal individualism scores [b = 0.57, $t(104) = 6.0$, $p < 0.01$]. Thus, Slovenian students who maximize were more individualistic on both the vertical and horizontal dimensions, offering further support for H1. Next, for contrast, the relationships between maximization and vertical and horizontal collectivism are tested to see if maximizing was unrelated to collectivism. Respondents vertical and horizontal collectivism scores were regressed on their maximization scores, resulting in a slightly negative but insignificant relationship between maximizing and vertical collectivism [b = −0.02, $t(104) = -0.13$, $p = 0.89$] and horizontal collectivism [b = −0.10, $t(104) = -1.0$, $p = 0.31$]. Thus, among Slovenian students, maximizing appears to be positively related to both dimensions of individualism and unrelated to vertical and horizontal collectivism. See Table 3 for descriptive statistics and Table 4 for regression results of individualism and collectivism dimensions based on maximization scores.

Next, the relationships between maximizing and entrepreneurial and social entrepreneurial intentions were tested using multiple regression analysis, with the controls of age and gender included. Results suggest that, among Slovenian students, maximizers have greater entrepreneurial intentions [b = 0.37, $t(104) = 1.78$, $p < 0.1$, $p = 0.07$], however, this time at a marginally significant level. Interestingly, maximizing did not increase social entrepreneurial intentions among Slovenian students [b = −0.19, $t(104) = -0.14$, $p = 0.18$]. To test whether the dimensions of individualism or collectivism may mediate the relationship between entrepreneurial intentions and maximizing, similar to what was found in study 1, parallel mediation was employed using model 4 of the bootstrapping process described by Hayes and Preacher (2014) with 5,000 samples. This time there were no interaction effects for the cultural dimensions on the positive relationship between maximizing and entrepreneurial intentions (b = −0.04, $CI_{95\%}$ [−0.34, 0.33]). Despite the limited sample size in study 2, Cohen's D indicated large effect sizes for the relationships with vertical (d = 1.14, $r = 0.49$) and horizontal individualism (d = 1.18, $r = 0.50$), suggesting adequate explanatory power. The mediation results of study two can be found in Figure 3.

Discussion

This study takes a first step in exploring how our decisional preferences of maximizing or satisficing relate to our cultural perspective and our tendencies to launch new business ventures. Specifically, it was found that among students in the U.S., those who maximize have a more individualistic cultural perspective, which tends to increase their intentions to become entrepreneurs. With a growing interest in social entrepreneurship worldwide (Zahra et al., 2014), the study also explores how our decision styles and cultural orientation may impact individual's intentions to start social enterprises. It appears that we can now add maximizing to the list of important factors that may encourage individuals to pursue entrepreneurial opportunities with a social mission. This makes sense given maximizers' constant search for better alternatives combined with their goals to maximize outcomes for themselves and others (Luan et al., 2018). As philanthropic and government funding for non-profit organizations becomes less sustainable in the U.S., social entrepreneurship has become an increasingly important means for solving social issues (Stecker, 2014) while creating new job opportunities (Rey-Martí et al., 2016).

It appears that among high maximizing individuals in the U.S., those who apply a more individualistic cultural orientation are more likely to seek out traditional entrepreneurial ventures, while those who are less individualistic are more inclined to start social enterprises. This distinction may be attributed to different entrepreneurial objectives based the way they view their role in society. Individualist view themselves autonomously, and independent from the group; prioritizing personal goals over those of the group, and viewing behaviors on a transactional basis (i.e., in exchange for payments; Triandis, 2001). For these reasons, it follows that those who apply an individualistic view may seek out traditional entrepreneurial opportunities over social ventures based on their personal incentives and the way they view social problems – perhaps seeing them as issues that are not best solved through entrepreneurial means.

By comparing students in the U.S. with students in Slovenia, it is apparent that the normative environment within national boarders plays an important role in shaping the way individual's may consider entrepreneurial opportunities and the type of ventures based on their personal cultural perspectives. Similar to students in the U.S., Slovenian students who maximize their decisions were far more individualistic than those who were more satisficing in their choices. This result extended to both vertical and horizontal dimensions of individualism, offering additional support for the relationship between maximizing and individualistic cultural views in an international context. Interestingly, it appears that maximizing is related to status

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TABLE 3 Study 2 descriptive statistics.

Descriptive statistics				
	Minimum	Maximum	Mean	Std. Deviation
Vertical Individualism	1.00	7.00	4.02	1.32
Horizontal Individualism	3.25	7.00	5.71	0.87
Vertical Collectivism	2.50	7.00	5.07	1.03
Horizontal Collectivism	2.00	7.00	5.54	0.82
Entrepreneurial Intentions	1.00	7.00	4.08	1.64
Age	20.00	50.00	23.61	5.35
Gender	1.00	2.00	1.70	0.46
Country (Slovenia)	1.00	1.00	1.00	0.00

Gender (1 = male, 2 = female) 70% of respondents were female

TABLE 4 Regression results for vertical and horizontal individualism and collectivism.

	Vertical individualism		Horizontal individualism		Vertical collectivism		Horizontal collectivism	
	β	*t*	β	*t*	β	*t*	β	*t*
Age	−0.05*	−2.43	−0.05**	−3.58	0	0.01	0.02	0.247
Gender	−0.54*	−2.24	0.18	1.14	−0.51*	−2.31	−0.18	0.31
Maximization	0.83**	5.8	0.57**	6	−0.02	−0.13	−0.11	0.31
Model R^2	0.29		0.29		0.05		0.03	
Adjusted R^2	0.27		0.27		0.02		0.01	
Model F	14.18**		14.1**		1.83		1.04	

$N = 107$. *$p < 0.05$; **$p < 0.01$.

distinctions through comparative analysis (vertical individualism) and a desire for autonomy in making decision independently (horizontal individualism). Because maximizing may be an inheritable trait (Saad et al., 2020), this outlook of persistently searching for better alternatives may shape the way individuals interact with others throughout their life, altering their cultural views.

It is not surprising that achievement orientation through a maximizing decision style may be ubiquitous across national boundaries. However, when it comes to pursuing those lofty ambitions through entrepreneurship, it appears that the prevailing cultural and economic environment may play a role in the way individual's view enterprising opportunities. Similar to the findings in study 1, Slovenian students who maximized had greater intentions to start entrepreneurial ventures; however, the relationship was only marginally significant, suggesting that maximizing students in Slovenian may not be as likely to pursue entrepreneurship as those in the U.S. It is possible that they consider more traditional career paths to meet their high desires for achievement. Interestingly, maximizers in Slovenia did not have greater social entrepreneurial intentions. Perhaps, pursuing new ventures is not the most viable means to tackle social problems based on Slovenia's historical importance of the public sector handling social issues. It is also possible that there is limited funding for such undertakings at the individual level. Development of Slovenian social entrepreneurship is governed and monitored primarily by adopted Act on Social Entrepreneurship in 2011 (Tomaževič and Aristovnik, 2018). In October 2018, 259 organizations were officially registered as social enterprises in the register, fulfilling all required law criteria. Social innovation in Slovenia is still in its early stages and remains largely underdeveloped without the proper supporting environment for social innovators (Tomaževič and Aristovnik, 2018).

Past work on maximizing or satisficing has found that national context may reduce some of the negative psychological outcomes associated with preferences for finding the best through maximizing. However, based on the broad social, cultural, and economic differences between countries and regions of the world, this study answers the call for a more nuanced look at the relationship between decision styles and cultural perspectives (Oishi et al., 2014; Schwartz, 2016). As the first study to directly measure individuals' cultural outlook based on their decision style (maximizing or satisficing), the results suggest some exciting applications to current theory and practice. It appears that in both the U.S. and Slovenia, maximizers are more inclined to apply an individualistic cultural view. Thus, they may prefer to work on their own terms, pursue individual goals and recognitions over collective ones, and may be reluctant to accept prevailing norms or submit to authority. These independently minded individuals may be well suited for innovative roles that provide a high level of

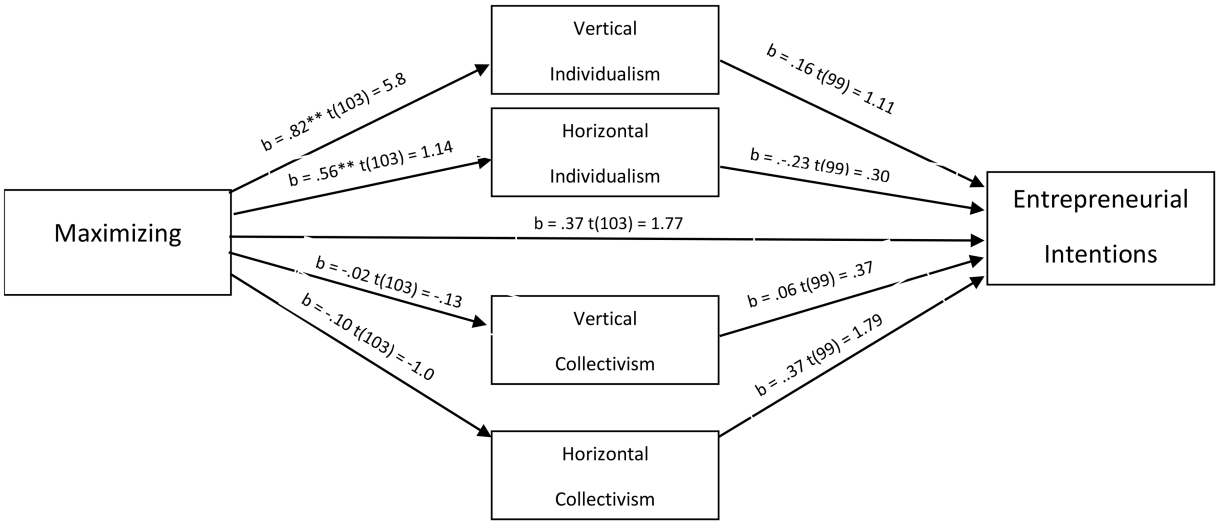

FIGURE 3
Mediation results of study 2.

autonomy over the decision-making process. For example, a new product lead, organizational manager, corporate entrepreneur or independent business owner may be positions that fit their personal dispositions toward searching extensively for better options.

Interestingly, individualism does not appear to be related to social entrepreneurial intentions in either the U.S. or Slovenian samples. It is possible that for those who seek status through individual achievements, social purposes may be less compelling than other reasons to start new ventures, such as financial gains or desires to be their own boss. This would align with individualistic characteristics of viewing oneself autonomously and independent from the group, prioritizing personal goals over those of others, and acting on a transactional basis (Triandis, 2001). It would be interesting for future research to see how those who apply an individualistic orientation may view societal problems, and whether they see entrepreneurship as an appropriate means to solve them.

Maximizing has been associated with building more market and entrepreneurially oriented businesses that achieve greater financial success (Soltwisch, 2021); thus, it is possible that an individualistic orientation may shape the way an entrepreneur goes about starting new ventures, perhaps impacting how successful they are depending on the support they receive for their individual efforts. Based on results from the U.S. sample indicating that individualistic maximizers are especially interested in entrepreneurial opportunities, it is conceivable that early in the startup process, an independent minded entrepreneur may be able to break the mold of what is commonly done by turning an idea into a viable product or service venture. In individualistic cultures (vs. collectivistic), people tend to favor charismatic leaders that can bring new ideas to market, and view leaders who have typical leader qualities in high regard (Ensari and Murphy, 2003). For example, Steve Jobs was notorious for his charismatic leadership style that united people around Apple's most innovative products (Sharma and Grant, 2011). However, as a business grows around new products and services over time, it would be interesting to see how individualism may affect a leader's ability to get others involved in building a shared vision for their collective efforts. Perhaps individualism is useful during the early stages of taking an idea to market, but a more collective outlook garners greater support as the business matures. It may be fruitful for future research to explore the longitudinal effects of entrepreneurs who apply an individualistic perspective to maximizing their decision efforts to understand these differences in style over time.

In addition to desiring the best results of their decisions, maximizers want to be the best, emphasizing relative outcomes over objective ones (Weaver et al., 2015; Luan et al., 2018). It makes sense that they apply a more individualist view as they prefer to control the decision-making process with the goal of obtaining desirable outcomes. Although as mentioned in previous work on maximizing and satisficing, this feeling of personal control over decisional outcomes can weigh on their evaluation of decisions in a way that produces regret and unhappiness (Schwartz et al., 2002), especially when others have done even better than them (Chan, 2021). For maximizers who apply an individualistic view, these detrimental psychological outcomes may be even more pronounced as they feel personally responsible for their decision outcomes. This would be in line with others who have found that maximizers are even more regretful and unhappy in the U.S., where personal decisions are seen as the primary avenue to achieving success, and happiness is considered on relative terms to those who are doing better perhaps socially or economically (Roets et al., 2012). Thus, those who maximize in the U.S. may be inclined to pursue opportunities at the expense of their own well-being. To follow up on this, future research could investigate

the cross-cultural impacts of well-being associated with maximizers who start entrepreneurial ventures.

Although new products and services can evolve from a single idea, entrepreneurship is a collaborative process, and the quality of team interactions is critical for success (Lechler, 2001). The results of the current study suggest that maximizers may be more inclined to start new ventures; however, further research is needed on the nature of founding team compositions to see what the best combination of decision strategies may be. It is possible that maximizing and satisficing are complimentary styles that both assist in the start-up process. Maximizers tend to apply a more innovative mindset by searching, sometimes exhaustively, for better alternatives. Yet, they can fall victim to over analyses in a way that leaves them stuck perfecting an idea rather than getting it out to the market. Because entrepreneurs often learn more by doing (Man, 2012), the satisficing mindset may offer a counterbalance to maximizers tendency to over evaluate, encouraging the team to move forward with what is good enough. This strategy may ultimately allow them to speed up the innovative process by receiving valuable feedback early on. Future research could investigate the combination of maximizing and satisficing decision strategies as they relate to successful innovation and new venture decisions. Similarly, it is possible that a new venture team may need a balance of cultural perspectives to ensure that individual pursuits can be supported by collective efforts. This study takes some important first steps toward understanding how decision styles and cultural orientation may affect individuals' intentions to start new business ventures. Undoubtedly, these findings provide many new avenues to enrich our understanding of the way entrepreneurs make decisions.

Practical and theoretical implications

Diversity trainings, as discussed by Triandis and Singelis (1998) and by Dimitrov (2005), can also be useful for all business processes, including understanding the entrepreneurial propensity of individuals for the purposes of increasing innovation and economic success of the enterprise. It appears that those who maximize their decisions may show greater entrepreneurial intentions. Another implication of the current study is to identify those who may be inclined to serve social purposes through entrepreneurial means. It appears that, at least in the U.S., those who see additional opportunities through a maximizing decision style may be more inclined to solve social problems through entrepreneurial means. Additionally, those who are less individualistic appear to be more apt toward social entrepreneurship than those who are more individualistic. These traits could be useful in identifying and training those who may promote economic development through entrepreneurial means. For example, a maximizing inventory could be used in entrepreneurial programs to see who may be alert to new business opportunities through information search.

It is possible that maximizing and satisficing are complimentary styles, and both assist in the start-up process. New venture teams may need a balance of cultural perspectives to ensure that individual pursuits can be supported by collective efforts. Furthermore, decision styles could be an indicator of innovative potential, and HR managers could identify employees who may share this mindset to allow for new products and services to meet market needs and fulfill social missions.

Study limitations

Although this paper explores some important potential antecedents of entrepreneurial behavior, it has some limitations that should be addressed. First, as with many entrepreneurial studies, intentions to start new business ventures may serve as a proxy for entrepreneurial behavior, these intentions do not always predict behavior. A longitudinal study following-up with intentions would lend validity to the model while providing additional insights into how entrepreneurs approach the decision to start new ventures. Although students can be an appropriate sample to measure entrepreneurial intentions because they are at the career decision stage, it would enhance generalizability if the proposed relationships could be tested among working populations. Overall, women are less likely to become entrepreneurs than men (Shane, 2008). Although gender was controlled for in both studies, the uneven number of males (45% in study 1) and females (70%) in study two may account for some of the variations in entrepreneurial intentions, potentially overestimating intentions in the U.S. sample while underestimating in the Slovenian sample. Given the exploratory nature of the research, participants completed all measures in a single survey. Using survey data is common in entrepreneurial studies, however, interesting variations in the research model may be identified if data could be collected using a longitudinal design employing mixed methods. Similarly, common methods variance can be a limitation of such research. As a post-hoc analysis, Harman's Single Factor Test was far below the 50% threshold recommended by Podsakoff et al. (2003) at 33.82%, suggesting that common methods bias was not a substantial concern in the current study. Finally, although we may begin to identify trends in data across cultures, specific conclusions about national cultural context cannot be drawn from this limited sample. As any exploratory study, replicating these relationships through additional research including other national contexts will enhance generalizability while recognizing boundary conditions for the observed effects.

Future research directions

It is recommended to explore in the future whether the cultural dimensions are relevant to entrepreneurial innovation. It is also interesting to look deeper into the question - Do export

market economies such as the US, in fact, emphasize the individualistic values per Triandis and Gelfand (1998)? Furthermore, it would be intriguing to see how individualism may affect a leader's ability to get others involved in building a shared vision for their collective efforts over time as a business grows.

Another direction to explore is whether social purposes may be less compelling than other reasons to start new ventures, such as financial gains or desires to be their own boss. A longitudinal study could identify better how maximizers or satisficers navigate the start-up process to see if decision styles and culture impact new venture success together.

It is also possible that the best combination of maximizing and satisficing decision strategies will play together for boosting successful innovation and new venture decisions. The longitudinal effects of entrepreneurs who apply an individualistic perspective to maximizing their decision efforts will also be useful in understanding the different decision-making styles.

Conclusion

This study takes many first steps in exploring how our decisional preferences of maximizing or satisficing relate to our cultural perspective and our tendencies to launch new business ventures. The findings provide many new avenues to enrich our understanding of the way entrepreneurs make decisions. Specifically, identifying that individual's decision styles and cultural perspectives shape the way people perceive new business opportunities may help to shape policy and identify individuals who are apt to start new ventures. Despite the global mindset of the business world, there will always be differences between the values and perceptions of people from different parts of the world. This study further identifies that these values should be considered as nations attempt to stimulate economic activity through the development of new business ventures.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Institutional Review Board, University of Northern Colorado. The patients/participants provided their written informed consent to participate in this study.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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How do locus of control influence business and personal success? The mediating effects of entrepreneurial competency

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This research aims to assess the influence of locus of control on the expression of entrepreneurial competency in a small business setting. Specifically, it predicts how this can generate positive outcomes in terms of business growth, quality of life, and sustainable entrepreneurial intention. Survey responses were collected from 102 small-sized firms in Malaysia. Structural equation modeling was performed to validate a mediation model and test nine research hypotheses. The results suggested that internal locus of control indirectly affects the venturing outcomes *via* entrepreneurial competency, whereas external locus of control has no such consequences. Thus, it can be deduced that beliefs based on internal attributions—rather than external forces, define entrepreneurs' destiny, and their competencies serve a perpetual role in linking these beliefs to positive business performance, life satisfaction, and sustainable entrepreneurial behavior. In practical terms, policymakers may gradually shift their focus from supplying direct financial relief assistance to the owner-managers to empowering them with core competencies building programs, especially during disasters and recessions. This study unravels the complexities of the entrepreneurial psychology-competency interface and fills a gap in the literature by providing compelling evidence of the adverse consequences of relying too heavily on fate or external assistance.

KEYWORDS

entrepreneurial competency, locus of control, business growth, quality of life, sustainable entrepreneurial intention, innovative, analytical, opportunity-seeking

Introduction

The study of entrepreneurial competency has often led to conflicting views about what motivates such ability and the outcomes, typically measured *via* entrepreneurial success. According to the entrepreneurship literature, entrepreneurial success is generally agreed to be influenced by intrinsic individual and extrinsic environment elements. However, little is understood about how entrepreneurs might capitalize on entrepreneurial prospects *via* this route. The potential answer may arise from their enterprising qualities, which may explain why some individuals behave differently than others in the same situation. The

entrepreneurial competency framework should accurately reflect these characteristics (Bird, 1995). Against this backdrop, academics have argued that the growth and development of nomological networks interacting with this construct remain comparatively slow and obscure. This ambiguity is exacerbated by the fact that entrepreneurial competencies are researched in numerous countries and cultural settings.

In his extensive meta-analytic review, Jain (2011) emphasized that, eventhough one's perceived personal control of business outcomes is more internally oriented for entrepreneurs than non-entrepreneurs, more genuine empirical observations are needed to build more comprehensive frameworks involving entrepreneurial competency and locus of control. The ongoing theoretical debate on entrepreneurs' psychological dispositions and personalities, particularly amid adversity, appears unabated. Several scholars, for instance, have recommended the incorporation of locus of control as one of the most important aspects of entrepreneurial competency (Jain, 2011; Lee et al., 2016). However, entrepreneurial ability and skills are dynamic in nature (Mitchelmore and Rowley, 2010; Tittel and Terzidis, 2020), whereas locus of control is constant over time due to the greater influence of cultural, social, and terminal values (Hartmann et al., 2022). Thus, we emphasize the urgent need for further theoretical clarification to increase the value of empirical contributions pertaining to entrepreneurial competency's antecedents and outcomes.

Generally, across the society, income generation is often thought to serve as the primary indicator of entrepreneurial success. Success certainly appears tempting to aspiring entrepreneurs when measured in economic and monetary terms. However, economic success from building wealth does not guarantee satisfaction with one's psychological wellbeing with his or her commercial endeavor. Existing studies have attributed entrepreneurial competency to tangible outcomes, namely business performance and wealth generation (see Mitchelmore and Rowley, 2010; Al Mamun and Fazal, 2018; Reis et al., 2020). Yet, entrepreneurial competency has rarely been investigated at the psychological interface, specifically by relating it to intrinsic and intangible consequences.

This materialistic view contradicts the general motivation principle that higher-order intrinsic rewards (e.g., livelihood improvement and ideal self) matter more than lower-order tangible rewards (e.g., income) (Shiferaw, 2020). Consequently, this issue offers us the opportunity to narrow the knowledge void by exploring the connections among entrepreneurial traits, entrepreneurial competency, and intrinsic outcomes. Notably, there is a lack of a distinctive model that links this competency with psychological wellbeing, entrepreneurial sustainability behavior, and their locus of control. There are several questions that were left unanswered. For instance, does competency lead to personal contentment with life and business continuity, and to what extent does entrepreneurs' sense of self-control assist them in achieving these outcomes? To subdue this confusion, we offer a framework that predicts a holistic entrepreneurial competency outcome based on business growth, quality of life, and sustainable entrepreneurial intention. Subsequently, these effects are proposed to be indirectly predicted by the entrepreneurs' locus of control.

The contribution of this study is 2-fold. First, this work tests a model that investigates the nature of the relationship between business growth, quality of life, sustainable entrepreneurial intention, entrepreneurial competency, and internal and external locus of control. To reiterate, the use of tangible (business performance) and intangible outcomes (quality of life and sustainable entrepreneurial intention) partly contributes to this study's novelty. Second, this study is among the earliest attempts to examine the mediating role of entrepreneurial competency on the relationship between locus of control dimensions and the outcome variables. The theoretical framework and hypotheses are presented in the subsequent section, followed by a discussion of the research methods and findings. The paper concludes with discussions on theoretical and managerial implications, limitations, and future research directions.

Self-determination theory and entrepreneurial success

Entrepreneurial success has been widely covered across the entrepreneurial psychology literature stream (e.g., Mitchelmore and Rowley, 2010; Khan et al., 2021), but its conceptualization remains unclear. Entrepreneurial success manifests in many forms (e.g., financial performance and business growth), but in general, the extant research lacks analysis at the individual level. Entrepreneurs' decisions to venture into business startups-while taking a risk to earn an uncertain living by leaving fixed-salary employment are motivated mainly by personal aspirations. These life goals typically revolve around attaining tangible rewards (economic values) and intangible rewards (self-actualization and self-esteem). The desire to improve one's quality of life frequently serves as a strong driver to overcome the risks of starting a business (Peters and Schuckert, 2014).

According to the self-determination theory (SDT), three basic and universal psychological requirements propel people to grow and change namely autonomy, competence, and relatedness (Ryan and Deci, 1985). SDT's application is relevant to the entrepreneurial field since entrepreneurs must be able to make decisions and govern their own lives to achieve a decent state of psychological wellbeing. Generating wealth alone would not suffice in representing success since people need to gain intrinsic rewards to appreciate and continue what they are pursuing. People's inner strength is driven by psychological contentment, and it is this source of motivation that allows entrepreneurs to persevere in the face of hardship and endless challenges (Chakraborty et al., 2019).

Unlike bigger corporations run by teams of managers, small business entrepreneurs frequently make decisions without consulting other members of the organization, banking only on their own abilities, and experience (Man et al., 2002). Their

self-determination and self-motivation propel them to be responsible for shaping their life destiny amid the uncertainty of generating a steady flow of income. Entrepreneurs are attracted to start a venture through time and money considerations, amid the common belief that fixed-income employment would not provide equivalent financial and non-pecuniary benefits. Contrary to salary earners' fixed working hours and prescribed tasks, entrepreneurs can harness time flexibility for balancing work-life matters and unravel hidden potential for personal development. Besides materialistic gains, these benefits also provide the route for physical, emotional, mental, and social wellbeing goals. Thus, the desire to reach a higher quality of life increases naturally.

Therefore, we argue that psychological wellbeing should be considered alongside other achievement goals such as business growth and continuity when analyzing entrepreneurial success *via* the lens of the SDT paradigm.

The entrepreneurial competency concept

For most small businesses captained by a single individual, personal differences or qualities act as determinants that explain how some entrepreneurs are more successful than others. Entrepreneurial competencies are defined as an individual's underlying attributes that lead to the formation of new ventures. In 1995, Barbara Bird proposed one of the earliest entrepreneurial competency concepts built on work of Boyatzis (1982) on managerial competencies. Competence forms an integral part of an entrepreneur's internal psychological state. It is more closely linked to venture performance than other psychological characteristics such as personality traits and internal motivation (Bird, 1995). In this regard, competencies act as enablers for behaviors of various entrepreneurial qualities, but they are not behaviors themselves.

The academic debate on this topic has centered on constructing a functional model of entrepreneurial competencies. In view of this concern, qualitative work of Bird (1995) was further validated into an empirical framework and a set of instruments that measures SME owner competitiveness *via* four dimensions: relational, innovativeness, analytical, and opportunity seeking (Man et al., 2008). Other than taxonomy of entrepreneurial competency of Bird (1995), the entrepreneurial competency concept is expressed across the literature through multiple knowledge streams. Many of these conceptualizations follow the knowledge-skills-attributes (or KSA) formula (Man et al., 2002).

For instance, interpretation of entrepreneurial competency of Cheetham and Chivers (1998) delves at work expectations, knowledge and skill input metrics, personal traits, and entrepreneurial characteristics *via* a holistic classification of interrelated job-related skill sets. These skill sets include cognitive, functional, personal, and meta-competencies. On the other hand, researchers also incorporated the aspects of individual entrepreneurial orientation (IEO) in explicating entrepreneurial competency. IEO is a unidimensional construct consisting of proactiveness, innovativeness, and risk-taking (Zmich et al., 2018). This incorporation of IEO is exemplified in the works of Man et al. (2008) and Mitchelmore and Rowley (2010). By incorporating this approach, researchers could focus on specific dynamic competencies cultivated among entrepreneurs by excluding personality traits that are largely stable and difficult to modify (Tittel and Terzidis, 2020). Idealistically, the skills of the entrepreneur change as the venture progresses through its stages of development.

Although a variety of competing models exist, scholars have raised doubt that no single concept alone can significantly predict entrepreneurial success. For instance, Gianesini et al. (2018) compared three mainstream entrepreneurial competency models and concluded that the different domains of entrepreneurial competency possess different levels of specificity and details, making these concepts to be incomparable to one another in terms of superiority and applicability. Furthermore, despite these extant academic studies examining and establishing competency-based frameworks for entrepreneurs, the scope seems to overlap and intertwine with the leadership and managerial disciplines (Mitchelmore and Rowley, 2010; Tittel and Terzidis, 2020). Given these limitations, this research aims to shed some light on reducing this ambiguity.

Literature and hypotheses

Entrepreneurial competency and business growth

Within the entrepreneurial literature, scholars generally concurred that a successful business venture is driven by the competence and abilities of the individual entrepreneur (Man et al., 2002; Reis et al., 2020; Riyanti et al., 2022). External market pressures such as shorter product life cycles, cut-throat pricing by aggressive competitors, and regulatory changes are constantly threatening small firms. Individuals who possess innovative and opportunity-seeking abilities would be able to absorb these pressures while growing the business. In addition, being analytical by striking a delicate balance between idea generation and risk-taking allows the owner-managers to exercise *'street-smart'* and prudent behaviors in the face of market uncertainty and technological turbulence. Moreover, connecting with the right networks allows them to develop mutually beneficial relationships with customers, partners, suppliers, and core stakeholders. In managing the competitive landscape, the effective realization of entrepreneurial competencies should result in productive market-oriented behaviors (Crick, 2021). In tandem with this argument, scholars concurred that entrepreneurial competencies equip the owner-managers to survive or succeed in a competitive business environment. For instance, Al Mamun and Fazal (2018) highlighted that entrepreneurial competency positively influences

micro-enterprise firm performance. In a similar vein, entrepreneurial competence contributes to firm performance *via* product innovativeness (Ng et al., 2019). In view of the discourse, this study posits the following hypothesis:

> *H1:* Entrepreneurial competency has a positive effect on business growth.

Entrepreneurial competency and quality of life

The importance of entrepreneurship is gradually transcending beyond traditional academic boundaries, from venture performance to psychological and non-work-related results. Aside from the materialistic appeal, entrepreneurs also possess the intrinsic motivation to embrace life contentment. As human beings, entrepreneurs seek to endeavor challenges to reach terminal values or end goals beyond the sphere of professional success and career recognition. These include happiness, self-respect, equanimity, and leading a prosperous life (Peters and Schuckert, 2014). The autonomy that entrepreneurship provides (e.g., becoming their own bosses, deciding on what hours to work, how much to pay, and when to take vacations) makes quality of life an attractive prospect for initiating a venture. Because small business entrepreneurs aspire to enhance their quality of life, their entrepreneurial behaviors are tailored toward lifelong learning and hard work to achieve success. The impact of entrepreneurship on quality of life has been explored from various perspectives. In terms of communal benefits, higher levels of entrepreneurship have a net positive impact on societal quality of life due to job creation opportunities (Morris and Sexton, 1996). Likewise, study of 24 nations of Woodside et al. (2019) across five continents found that nations highly supportive of nurturing entrepreneurial behavior consistently achieve a higher quality of life scores than nations with lower entrepreneurial behavior configuration scores. In terms of individual satisfaction, entrepreneurial engagements are associated with quality of life attributes, such as freedom, work-life balance, health, and happiness (Peters and Schuckert, 2014; Chakraborty et al., 2019). Drawing upon these facts, we offer the following hypothesis:

> *H2:* Entrepreneurial competency has a positive effect on quality of life.

Entrepreneurial competency and sustainable entrepreneurial intention

Understanding entrepreneurship requires an understanding of entrepreneurial intention, since it reflects one's desire to own a business (Krueger Jr et al., 2000). Despite the interest in entrepreneurial intentions, there is still only limited evidence about entrepreneurial intentions in different entrepreneurship contexts. Many of these entrepreneurial intention studies are focused on students and prospects with little or no prior business experience. Beyond the entrepreneurial education theme, few studies have adequately explained intentions to remain in an entrepreneurial career (Marshall et al., 2019). In line with the operationalization put forth by Polas et al. (2021), we defined sustainable entrepreneurial intention as the business owner's intention to sustain in an entrepreneurial career. Not to be confused with sustainability-oriented entrepreneurial intention that factors in environmental consideration (Vuorio et al., 2017), the term "sustainable" refers to an entrepreneur's propensity to remain in an entrepreneurial career. This connotation also reflects the long-term desire to remain in pursuit of business ownership rather than other forms of employment. The SDT theory is in harmony with sustainable entrepreneurial intention since it elucidates how business owners control their future while remaining professionally and socially competent amid persistent challenges. As small companies are typically under-resourced, obtaining market intelligence while being entrepreneurially focused simultaneously could be too costly to materialize (Hamzah et al., 2023). Due to a lack of resources, incorrect judgments are made, such as pursuing unprofitable markets, taking poorly calculated risks, investing in the wrong products, and making other poor choices (Crick et al., 2021). To stay relevant in the business for the long haul, entrepreneurs need to remain competent to prevent these miscalculations and navigate themselves *via* the correct path. Therefore, the following research hypothesis is offered:

> *H3:* Entrepreneurial competency has a positive effect on sustainable entrepreneurial intention.

Indirect effects of internal locus of control on venturing outcomes *via* entrepreneurial competency

Individuals who possess an internal locus of control believe they have the ability to control their environment (Rotter, 1996). In other terms, it relates to who or what controls an individual's destiny. Therefore, individuals with an internal locus of control are more likely to assume that their activities influence the rewards or results they receive. Since their conviction in their own talents makes them more proactive and alert to entrepreneurial opportunities, internal locus of control permits owner-managers to effectively search for and discover worthwhile venture prospects (Asante and Affum-Osei, 2019). Across the entrepreneurial literature, internal locus of control has traditionally been used to rationalize entrepreneurial activities (Krueger et al., 2000; Ndofirepi, 2020). In this regard, an internal locus of control plays a decisive role in building individual intention to sustain an entrepreneurial career. Individuals with an internal locus of control believe that they will succeed in entrepreneurship (Baldegger et al., 2017). People

who believe in their skills, effort, and abilities, are more likely to harness and enhance their knowledge and abilities when faced with problems and obstacles.

Previous works have associated internal locus of control with opportunity recognition (Asante and Affum-Osei, 2019), career motives (Baldegger et al., 2017), learning from failure, and recovery capabilities (Zhao and Wibowo, 2021). Notably, these studies do not consider entrepreneurial-related competencies and skills in understanding the entrepreneurial intention-locus of control nexus. The question may thus be raised whether an internal locus of control enables the necessary competency that will eventually unlock their intention to sustain an entrepreneurial career. The attribution toward self could be an effect of previously achieved success in starting a venture and should be relatively stable in predicting one's entrepreneurial abilities (Schjoedt and Shaver, 2012). Therefore, we argue that internal locus of control will lead to one's sustainable entrepreneurial intention through entrepreneurial competency.

> *H4a:* Entrepreneurial competency mediates the effects of internal locus of control on business growth.
>
> *H4b:* Entrepreneurial competency mediates the effects of internal locus of control on quality of life.
>
> *H4c:* Entrepreneurial competency mediates the effects of internal locus of control on sustainable entrepreneurial intention.

Indirect effects of external locus of control on venturing outcomes *via* entrepreneurial competency

In contrast to those with an internal locus of control, individuals with an external locus of control view growth prospects as being influenced by outside forces. In other words, they heavily rely on support from others to be successful. Individuals with this personality type are susceptible to external attributions of events and situational threats. As a result, they are anxious and skeptical of transforming an opportunity into a profitable endeavor since any effort exerted is perceived of not leading to any meaningful result (Malik et al., 2014). Therefore, such people may be less likely to persist in performing a task. From the entrepreneurial perspective, excessive attributions to external factors will limit entrepreneurs' willingness to continue running a business. Since they operate in highly unpredictable and dynamic business environments, entrepreneurs are frequently exposed to these fluctuating external conditions, such as unexpected changes in market competition, needs, and regulations. Although these factors are beyond their control, entrepreneurs who lack resilience may be unable to effectively manage their business operations (Hartmann et al., 2022).

The overdependency on external support and luck—the elements that characterize external locus of control-is expected to negatively affect entrepreneurial judgment and actions following adverse events. These events typically include the failure to secure funds or contracts, the sudden exit of business partners, diminishing market demand, and unfavorable regulatory changes, to name a few. Scholars contended that over-reliance on the external locus of control could jeopardize entrepreneurial outcomes if it is not handled wisely, even though recent studies indicated that this counter-productive psychological trait could co-exist together with the internal locus of control (Arkorful and Hilton, 2021; Hoang et al., 2022).

For instance, external locus of control weakens the impact of opportunity recognition on entrepreneurial intention (Hoang et al., 2022). In another study, external locus of control negatively affects opportunity recognition *via* entrepreneurial intention (Asante and Affum-Osei, 2019). Therefore, we contend that external locus of control potentially disrupts entrepreneurial thoughts and actions, as circumventing difficult situations—rather than confronting them, often demoralizes one's desire to progress forward. Accordingly, we laid forth the following hypothesis:

> *H5a:* Entrepreneurial competency mediates the effects of internal locus of control on business growth.
>
> *H5b:* Entrepreneurial competency mediates the effects of internal locus of control on quality of life.
>
> *H5c:* Entrepreneurial competency mediates the effects of internal locus of control on sustainable entrepreneurial intention.

Figure 1 below illustrates our research model, summarizing the hypotheses presented above. The entrepreneurial competency construct is operationalized as a second-order construct with four dimensions: relational, innovativeness, analytical, and opportunity seeking (Man et al., 2008). The construct follows a unidimensional configuration in line with the recommendations of entrepreneurship scholars (see Covin and Slevin, 1989; Zmich et al., 2018).

Methods

Samples and data collection procedure

A quantitative research approach was employed to address the research hypotheses, which included the use of a structured questionnaire. We utilized a judgmental/purposive sampling approach to address the study's research questions. The sample elements were chosen based on their conformity to predefined entrepreneurial-related criteria, despite the

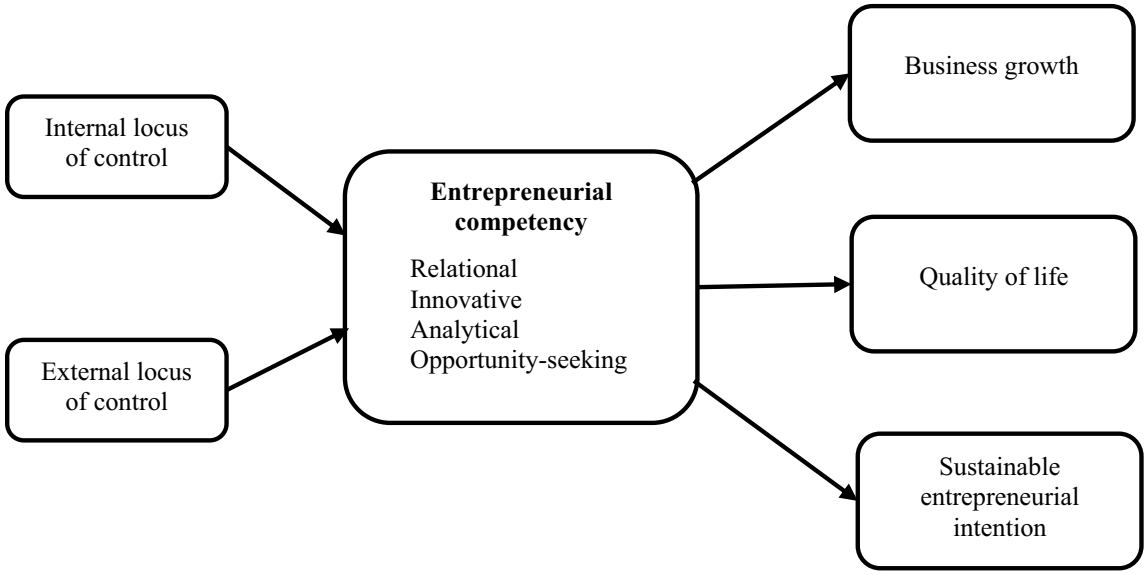

FIGURE 1
Research framework.

nonprobability sampling design and subjectivity of the selection (Botha and Taljaard, 2021). That is, the subject should be comprised of owner-manager of sole-proprietorship or partnership types of businesses that have been operating for at least 2 years.

Furthermore, the selection satisfied the country's small business criterion of having a revenue of not more than RM15 million (approximately USD 3.43 million) in manufacturing or RM3 million (approximately USD 685,000) in services. Pre-existing directories from SME-related agencies (such as SME Corporation) were used to source the contact details of the entrepreneurs. The survey was emailed and texted to approximately 570 owner-managers, with a realized sample of 165 (representing a low response rate of 28.9%). Sixty-two of the samples were discarded due to missing values, incompleteness, straight-lining responses, and unqualified subjects, hence yielding 102 usable responses.

Although the usable sample is small, it provided reasonable statistical power to test the research model. A power analysis based on the portion of the model with the largest number of predictors was performed using G-Power to assess the sufficiency of the sample size (Cohen, 1988). With two independent variables, the recommended sample size of 68 to obtain a power of 0.80 was exceeded comfortably, assuming a medium effect size of 0.15 and an α of 0.05 (Cohen, 1992). Through the bootstrapping technique, SmartPLS can predict path coefficients of datasets with small sample sizes with the same precision as those with larger sample sizes (Ramayah et al., 2018). Hence, our sample size is deemed adequate, and it is not a severe concern that would jeopardize the results' integrity. Table 1 summarizes the demographic profiles of the respondents.

Measures

The latent variables were operationalized in the following ways (Table 2 displays a comprehensive list of the multi-item measures and their codes). First, locus of control was measured using an adapted version of scale of Chen et al. (1998). Specifically, internal locus of control and external locus of control were employed as two facets of the locus of control construct; each represented by five items. Most studies throughout the extant psychological literature have suggested that these two forms of locus of control are among the most important aspects of personality since they capture one's perception of the main underlying causes of events in their lives. Second, entrepreneurial competency was conceptualized as a four-component second-order construct, consisting of relational (six items), innovative (three items), analytical (four items), and opportunity seeking (four items). These items were adapted from Man et al. (2008).

Third, business growth was measured using a seven-point interval scale with four elements, ranging from 1 to 7, with 1 denoting a reduction of more than 30%, and 7 denoting an increase of more than 30% (adapted from Eijdenberg et al., 2015). Fourth, the quality of life construct was measured using four items adapted from Diener et al. (1985). Fifth, a four-item scale was adapted from Polas et al. (2021) and Vuorio et al. (2017) to measure sustainable entrepreneurial intention. With the exception of business growth, the items for these constructs were measured using a five-point Likert scale that ranged from 1 (strongly disagree) to 7 (strongly agree). Finally, this study controlled for gender, firm age and firm size. In terms of firm size, this variable was measured through the number of full-time employees (Josephson et al., 2016). Two international academic experts who

TABLE 1 Profiling information on the sampled businesses (n=102).

Characteristics		Freq.	%
Gender	Male	57	55.9
	Female	45	44.1
Age	20–30 years old	14	13.7
	31–40 years old	25	24.5
	41–50 years old	42	41.2
	51 years old & above	21	20.6
Sector	Services	32	31.4
	F&B	28	27.5
	Retail & Trading	15	14.7
	Manufacturing	7	6.9
	Others	20	19.6
Business age	2–5 years	50	49.0
	6–10 years	24	23.5
	11–15 years	11	10.8
	16–20 years	7	6.9
	21 years and above	10	9.8
Full-time employees	1–5 people	79	77.5
	6–10 people	5	4.9
	11–15 people	5	4.9
	16–20 people	1	1
	21–25 people	1	1
	>25 people	11	10.8

specialized in the theoretical issues and context of this study evaluated and pre-tested the instruments prior to the commencement of the survey.

Analysis

Structural equation modeling (SEM) is one of the most frequently utilized tools in entrepreneurial behavior research, especially for estimating causal models and hypotheses. SEM allows researchers to test a number of related hypotheses simultaneously by estimating the associations between multiple independent and dependent variables in a structural model (Gefen and Straub, 2005). Partial least square-SEM (PLS-SEM)-rather than covariance-based SEM (CB-SEM), was chosen based on two merits. First, PLS-SEM performs better than CB-SEM in complex models that include latent and hierarchical constructs with a large number of indicators (Chin et al., 2008). Second, PLS-SEM is the preferred approach to maximize the explained variance of the endogenous constructs (Hair et al., 2017). By using the SmartPLS software (Ringle et al., 2015), we tested the measurement and structural models, following Anderson and Gerbing (1988). Four procedures constitute the process of estimating PLS path model parameters. First, an iterative algorithm computes composite scores for each construct; second, attenuation is corrected for the constructs that are treated as factors; third, parameters are estimated; and fourth, inference is tested by bootstrapping (Henseler et al., 2016).

Results

Measurement model

The measuring model was evaluated for its reliability and validity. The four standard criteria for evaluating reliability and validity are individual item reliability, construct reliability, convergent validity, and discriminant validity (Hair et al., 2017).

First, since the latent variables are modeled as reflective, the item loadings of the constructs were observed to ascertain their individual item reliability. Majority of the items exhibit loadings higher than 0.7, with the exception of four items with loadings between 0.52 and 0.7. In this regard, although the general rule dictates that item loadings should be higher than the 0.7 threshold, items with lower loadings (0.5 or 0.6) are acceptable as long as the summation of the loadings contributes to average variance extracted values (AVE) scores of greater than 0.5 (Hulland, 1999: Ramayah et al., 2018).

Second, the construct reliability of the main variables was measured *via* the composite reliability (CR) indicator. The CRs for all of the constructs ranged from 0.87 to 0.96, and these figures far exceeded the minimum threshold of 0.7. Third, the AVE was used to assess the convergent validity, and these AVE indicators for all constructs were higher than the 0.5 thresholds. Table 2 presents the values of the loadings, CRs, and AVEs for all of the latent variables. Finally, we assessed the discriminant validity by testing both Fornell and Larcker's and HTMT criterion.

Based on the Fornell-Larcker's criterion, the largest squared phi matrix correlation (0.492) was less than the smallest average variance extracted (0.684), signifying no discriminant validity concerns. As for the HTMT criterion, the correlation values are lower than 0.85 and 0.90, according to HTMT.85 (Kline, 2011) and HTMT.90 (Gold et al., 2001) thresholds. Based on these correlation results (Table 3), it can be concluded that the measures did not overlap each other, and discriminant validity is firmly established.

Structural model

Following the examination of the measurement model, the structural model was evaluated. As a result, the structural model was assessed using the variance explained (R^2) and path coefficient. This study used a bootstrapping approach (5,000 samples) to determine the significance of the path coefficients using t-values. These criteria align with suggestions of Hair et al. (2014). The analysis reveals that the structural model explained about 7.1% of the variance in business growth, 24.2% in QoL, 17.0% in sustainable entrepreneurial intention, and 16.1% in entrepreneurial competency.

TABLE 2 Confirmatory factor analysis model.

Item	Scale	Loadings	CR	AVE
	Internal locus of control			
ILC2	My life is determined by my own actions.	0.703	0.812	0.520
ILC3	I can pretty much determine what will happen in my life.	0.779		
ILC4	When I make plans, I am almost certain to make them work.	0.712		
ILC5	When I get what I want, it's usually because I worked hard for it.	0.687		
	External locus of control			
ELC1	To a great extent my life is controlled by accidental happenings.	0.714	0.818	0.530
ELC3	When I get what I want, it's usually because I'm lucky.	0.790		
ELC4	It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune.	0.675		
ELC5	Whether or not I get to be a leader depends on whether I'm lucky enough to be in the right place at the right time.	0.727		
	Ent. Competency (Second-order construct)			
	Relational	0.771	0.903	0.699
	Innovativeness	0.840		
	Analytical	0.906		
	Opportunity seeking	0.822		
	Relational			
REL1	Develop long-term trusting relationships with others.	0.517	0.866	0.525
REL2	Negotiate with others.	0.829		
REL3	Interact with others.	0.854		
REL4	Maintain a personal network of work contacts.	0.631		
REL5	Understand what others mean by their words and actions.	0.685		
REL6	Communicate with others effectively.	0.775		
	Innovativeness			
INV1	Look at old problems in new ways.	0.820	0.889	0.727
INV2	Explore new ideas.	0.862		
INV3	Treat new problems as opportunities.	0.875		
	Analytical			
AN1	Apply ideas, issues, and observations to alternative contexts.	0.854	0.917	0.736
AN2	Integrate ideas, issues, and observations into more general contexts.	0.909		
AN3	Take reasonable job-related risks.	0.775		
AN4	Monitor progress toward objectives in risky actions.	0.887		
	Opportunity seeking			
OP1	Identify goods or services customers want.	0.914	0.940	0.796
OP2	Perceive unmet consumer needs.	0.888		
OP3	Actively look for products or services that provide real benefit to customers.	0.922		
OP4	Seize high-quality business opportunities.	0.843		
	Business growth			
BG1	How did the number of employees of the business change over the past year of operation?	0.714	0.937	0.790
BG2	How did the business sales change over the past year of operation?	0.930		
BG3	Has your income from the business increased over the past year?	0.957		
BG4	How did the gross value of the organization's change over the past year of operation? (Value of assets over liabilities)	0.932		
	Quality of life			
QoL1	In most ways my life is close to my ideal.	0.794	0.889	0.618
QoL2	The conditions of my life are excellent.	0.838		
QoL3	I am satisfied with my life.	0.843		
QoL4	So far I have gotten the important things I want in life.	0.793		
QoL5	If I could live my life over, I would change almost nothing.	0.646		

(Continued)

TABLE 2 (Continued)

Item	Scale	Loadings	CR	AVE
	Sustainable entrepreneurial intention			
INT1	I am ready to do anything to sustain my own business.	0.867	0.958	0.852
INT2	I will make every effort to sustain my own business.	0.929		
INT3	I'm determined to sustain my business in the future.	0.963		
INT4	I have very seriously thought about sustaining my business.	0.931		

Based on the structural model (Figure 2) and the hypothesis testing (Table 4), six of the nine proposed relationships were significant and supported. First, the hypothesized direct effects were analyzed. The path between ENTCOMP and BG was significant ($\beta = 0.27$, $t = 2.96$), fully supporting H1. Similarly, ENTCOMP and QoL's path was also significant ($\beta = 0.49$, $t = 6.45$), confirming the support for H2. Next, the relationship between ENTCOMP and INT was statistically significant ($B = 0.41$, $t = 4.97$), confirming H3.

Second, the indirect effects for the mediation paths were estimated through bootstrapping procedure (Preacher and Hayes, 2008). We found that ENTCOMP mediated the effect of ILC on BG ($\beta = 0.10$, $t = 2.46$, CI = [0.04, 0.18]), the effect of ILC on QoL ($\beta = 0.19$, $t = 3.73$, CI = [0.09, 0.28]), and the effect of ILC on INT ($\beta = 0.16$, $t = 3.23$, CI = [0.07, 0.25]). Hence, H4a, H4b, and H4c were supported. Unpredictably, ELC was not found to have any indirect effects on BG ($\beta = 0.02$, $t = 0.43$, CI = [−0.14, 0.07]), QoL ($\beta = 0.04$, $t = 0.47$, CI = [−0.21, 0.11]), and INT, ($\beta = 0.03$, $t = 0.49$, CI = [−0.16, 0.09]) *via* ENTCOMP. Thus, H5a, H5b, and H5c were unsupported.

Discussion

The current study examines the mediation effects of entrepreneurial competency on the link between locus of control on business growth, quality of life, and sustainable entrepreneurial intention. Grounded in self-determination theory (Deci and Ryan, 1985), the exogenous constructs represent an individual's intrinsic growth inclinations and psychological needs. To recapitulate, this result indicated that entrepreneurial competency directly affects all three entrepreneurial outcomes, namely business growth (H1), quality of life (H2), and sustainable entrepreneurial intention (H3). In addition, internal locus of control, rather than external locus of control, functions as a predictor of entrepreneurial competency. More importantly, our results lend evidence for hypotheses H4a, H4b, and H4c vis-a-vis the mediating pathway of entrepreneurial competency for the links between internal locus of control and entrepreneurial outcomes, namely business growth, quality of life, and sustainable entrepreneurial intention. Contrary to our expectations, external locus of control has insignificant indirect effects on the outcomes *via* entrepreneurial competency; thus, H5a, H5b, and H5c are rejected. Following an empirical survey employing quantitative data from Malaysia, we derive these important contributions to the extant entrepreneurial psychology literature.

First, the nature of relationships among the hypothesized direct paths yielded several key takeaways that narrow the gap within the entrepreneurial psychology literature. These findings also complement and support a few studies examining entrepreneurial competency from the small business setting. For instance, scholars have positively associated entrepreneurial competency with business growth (Al Mamun and Fazal, 2018), and sustainable entrepreneurial intention (Botha and Taljaard, 2021). In justifying the positive causal and effect link between entrepreneurial competency and the outcomes, it is worth noting that entrepreneurship acumen, similar to leadership, is nurtured by commitment rather than inborn genetically or naturally gifted (Biswas, 2022). Owner-managers who equip themselves with the right enterprising roles and skills are in a favorable position to achieve both life and career goals due to their ability to navigate amid resources constraints and hostile environments (Solesvik, 2012). Contrary to the resources-based approach (Barney, 1991) that regards entrepreneurship as a firm value creation process of leveraging resources and assets, entrepreneurship, from the psychological view, emphasizes individuals' motivation to succeed and exhibit resilience against failure (Zhao and Wibowo, 2021). These individual qualities nurtured over time collectively enable the venture to become equally resilient and progressive.

Second, entrepreneurial competency performs intervention roles in explaining the causal link between internal locus of control and the entrepreneurial outcomes. These outcomes encompass both the career and personal success of entrepreneurs. Although a growing body of studies investigates micro-level entrepreneurial outcomes from the monetary and growth perspectives, personal success, and entrepreneurial sustainability intention received insufficient attention. Our findings imply that positive-thinking entrepreneurs benefit from utilizing their skill sets to achieve a good quality of life and inclination to remain in the entrepreneurial career. On the other hand, having negative attribution and being externally overdependent on others risk the entrepreneur experiencing high levels of task uncertainty and conflicting roles, leading to worsening work satisfaction (Hamwi et al., 2014). The accumulation of this discontent eventually casts doubt on their desire to continue in business. It makes it more difficult for them to imagine what a perfect life accomplishment would be. This phenomenon should explain the absence of any mediating effects involving the external locus of control.

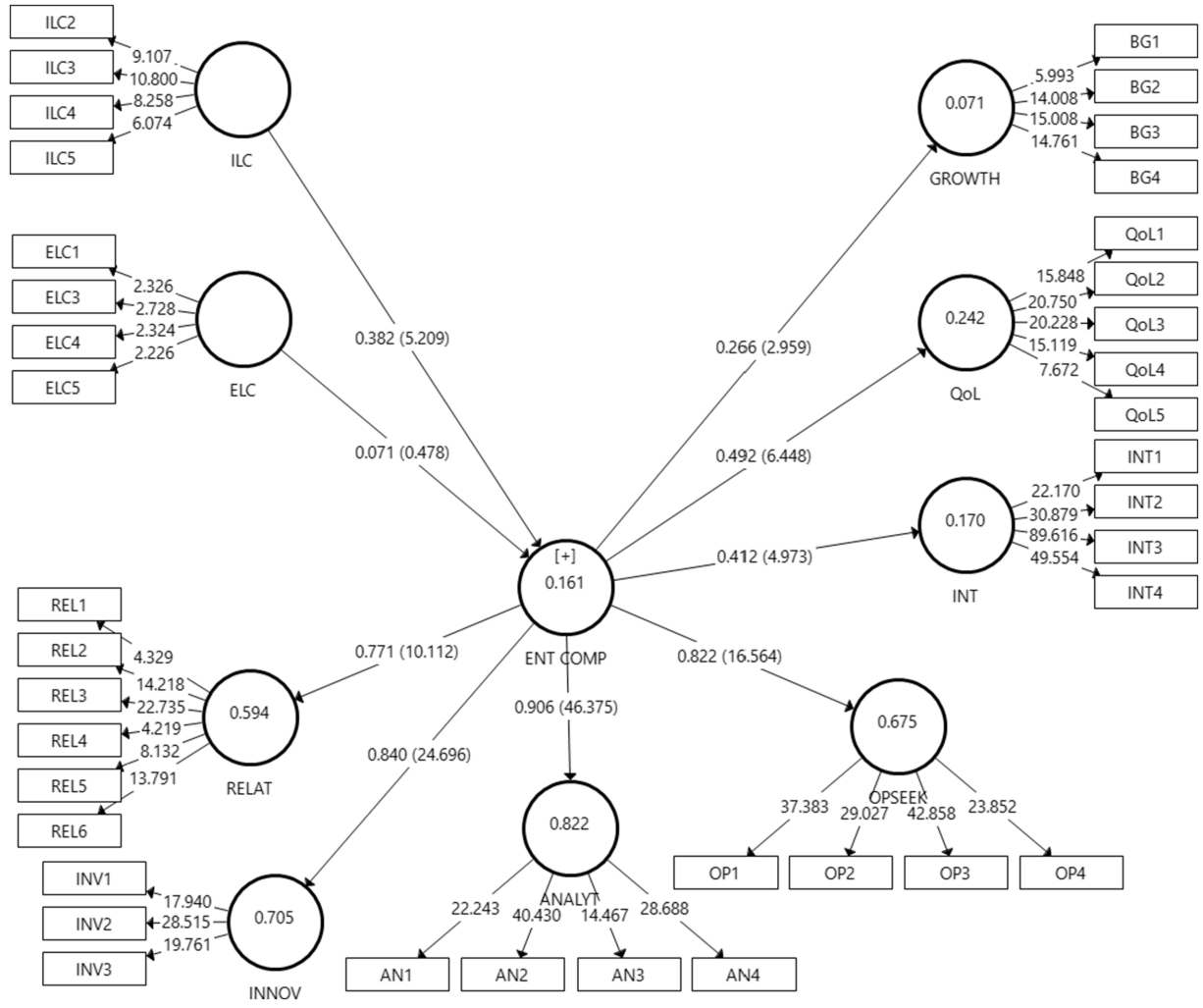

FIGURE 2
Structural model.

TABLE 3 Discriminant validity.

	ILC	ELC	ENT COMP	BG	QoL	INT
ILC	*0.721*	0.298	0.477	0.201	0.355	0.375
ELC	0.182	*0.728*	0.256	0.210	0.148	0.138
ENTCOMP	0.395	0.141	*0.684*	0.284	0.567	0.447
BG	0.138	−0.163	0.266	*0.889*	0.349	0.142
QoL	0.274	0.034	0.492	0.317	*0.786*	0.416
INT	0.318	0.008	0.412	0.118	0.374	*0.923*

Numbers in italics (diagonal) indicate the square root of the AVE. The figures on the lower left (below the diagonal) reflect Fornell-Larcker's criterion while figures on the upper right (above the diagonal) follow the HTMT criterion. ILC, internal locus of control; ELC, external locus of control; ENTCOMP, entrepreneurial competency; BG, business growth, QoL, quality of life; and INT, sustainable entrepreneurial intention.

Thirdly, our research demonstrates that entrepreneurial competence is not a significant mediator between external locus of control and entrepreneurial outcomes. External locus of control is also unrelated to entrepreneurial outcomes or competency. To recapitulate, earlier evidence has been very equivocal. External locus of control has a detrimental effect on outcomes including satisfaction (Hamwi et al., 2014) and entrepreneurial intention (Asante and Affum-Osei, 2019). In contrast, exterior locus of control predicts entrepreneurial intentions more strongly than internal locus of control (Hoang et al., 2022; Akorful & Hilton; 2021). Past research suggests that having an internal locus means that a person is self-reliant and self-confident, has strong determination and perseverance, and is most likely to embrace a culture that values individualism and avoids uncertainty (Jain, 2011). This assumption, however, could be comfortably disproven by the fact that Malaysian entrepreneurs, who live in a society with a collectivist and low-uncertainty avoidance culture (Tehseen et al., 2021), rely more on internal than external locus, as the results have shown. Countries with low uncertainty avoidance, for example, may culturally inculcate individuals to be more inclined to take risks and accept ambiguous situations (Hofstede et al.,

TABLE 4 Hypothesis testing.

No	Path	Coeff.		*t*-value	value of *p*	Bias corrected		Supported?
						LLCI	ULCI	
	Direct paths							
	ILC → ENTCOMP	0.382	***	5.209	0.000	0.219	0.509	
	ELC → ENTCOMP	0.071		0.478	0.633	−0.409	0.212	
H1	ENTCOMP → BG	0.266	**	2.959	0.003	0.096	0.423	Yes
H2	ENTCOMP → QoL	0.492	***	6.448	0.000	0.315	0.618	Yes
H3	ENTCOMP → INT	0.412	***	4.973	0.000	0.230	0.561	Yes
	Indirect paths							
H4a	ILC → ENTCOMP → BG	0.101	*	2.463	0.014	0.036	0.184	Yes
H4b	ILC → ENTCOMP → QoL	0.188	***	3.730	0.000	0.088	0.281	Yes
H4c	ILC → ENTCOMP → INT	0.157	**	3.233	0.001	0.065	0.251	Yes
H5a	ELC → ENTCOMP → BG	0.019		0.425	0.671	−0.135	0.066	No
H5b	ELC → ENTCOMP → QoL	0.035		0.467	0.641	−0.213	0.107	No
H5c	ELC → ENTCOMP → INT	0.029		0.488	0.626	−0.162	0.085	No

Standardized regression coefficients are reported. Bootstrap sample size = 5,000. SE, Standard Error; CI, confidence interval; LL, lower limit; UL, upper limit; ILC, internal locus of control; ELC, external locus of control; ENTCOMP, entrepreneurial competency; BG, business growth; QoL, quality of life; and INT, sustainable entrepreneurial intention. *$p < 0.05$; **$p < 0.01$; and ***$p < 0.001$.

1997). Consequently, it is plausible that Malaysians do not behave with a locus that is totally devoid of external factors. They may credit positive outcomes to teamwork (due to collectivism) or embrace negative events as pre-destined fate with a silver lining (due to the society's low levels of uncertainty avoidance).

In a broader sense, entrepreneurial competencies at the micro-level are sometimes misconstrued for fixed, immutable traits based on personal qualities. Entrepreneurial competency neither exists alone nor exists on its own; rather, it is nurtured through positive self-beliefs of own capabilities (Chien-Chi et al., 2020; Wang et al., 2022). We reiterate our earlier stand that skills and abilities—rather than traits (or personal attributes, qualities, and characters) are dynamic and progressive as the entrepreneur gains more maturity and accumulate experience. These competencies are gradually inculcated and remastered by self-reflection and learning from past mistakes (Zhao and Wibowo, 2021). In summary, this study contributes to the literature by resolving some of the intricacies in the realms of entrepreneurial competencies, and professional and life outcomes that consider both internal and external locus of control aspects.

Implications and limitations

Practical contributions

The findings offer insight into how entrepreneurs control their psychological traits to develop the necessary competencies for professional and personal success. Therefore, we derive several managerial implications for entrepreneur stakeholders, such as business owners, investors, lawmakers, and public agencies. First, as our empirical findings indicate, owner-managers equipped with the right venturing skillsets and abilities are more likely to experience business continuity, growth, and life satisfaction. The entrepreneur stakeholders, especially public entrepreneurial development agencies, can dedicate the resources that matter most to these entrepreneurs by reinforcing their relationship-building, innovativeness, analytical, and opportunity-seeking skills. Talent development programs that focus on opportunity recognition should enable them to take advantage of promising business ideas while the window of opportunity is still intact (Asante and Affum-Osei, 2019). For instance, competency can be nurtured *via* entrepreneurship competition among youths and university students by educational institutions and public agencies (Wang et al., 2022).

Second, this research demonstrates that if entrepreneurs view life consequences as highly controllable as the results of their individual actions, this attribution should enhance their career and life success *via* entrepreneurial competency enhancement. This research inspires entrepreneurs to instigate a paradigm shift by framing the correct terminal values within their mindset. Stakeholders may instill deeper motivation in entrepreneurs by convincing them that they are the masters of their own destiny. Entrepreneurs should encourage their employees to strive for and exceed benchmarking standards by establishing them in the first place (Biswas, 2022). Besides, entrepreneurs should not discount the opportunity to learn from failure due to involvement in risky actions. Past failures teach them fresh ways to solve problems and limitations and appropriately assess the costs and benefits of each business decision. This retrospection process reinforces beliefs in their own ability and wisdom in undertaking risky activities while actively exploring new ideas, products and markets.

Third, the study may suggest that Malaysians—especially the Malay-ethnic majority, are becoming more independent and less

reliant on government-related assistance. Malaysia is among the few countries globally that incorporated an affirmative action policy that guarantees the ethnic Malay majority preferential rights to government projects, public administration recruitment, and tertiary education admissions. Hence, this "*crutch-mentality*" culture, in some ways, goes against the spirit of entrepreneurship by eliminating the psychological aspects of risk-taking and resilience (Shome and Hamidon, 2009). Malaysian entrepreneurs, in some ways as this study has indicated, have gradually shifted their mindset away from the legacy ways of overdependency on government-related assistance and political affiliations. Hence, the law-and policy-makers should reconsider incorporating this positive development into their future entrepreneurial agendas. Money could be well spent on entrepreneurial development rather than outright cash assistance or subsidies. Public funds should be channeled to programs that develop strategic market intelligence and opportunity recognition abilities among youths and potential startups. Besides, entrepreneurs should be encouraged to compete in the open markets rather than chasing government-sourced contracts and procurements.

Limitations and scope for future research

Similar to other empirical research, this study has some limitations. First, the current model was tested using a cross-sectional survey, which may inflate the chances of common method variance (Podsakoff et al., 2012). A two-wave survey could be used in future studies to analyze the temporal sequence of entrepreneurial competency and outcomes. Second, our study did not offer a balanced view of locus of control expectancy—a combination of internal and external locus of control, also known as *dual control* or *bi-local expectancy* (Torun and April, 2006). External locus of control is not wholly negative in all circumstances. In a challenging business landscape, entrepreneurs with an external locus may assume that their prospects of survival or success are influenced by forces they cannot control, such as market and institutional dynamics. In anticipation of exogenous shocks, a moderate amount of external locus of control may result in greater levels of mindfulness and resilience (Cater et al., 2021; Hartmann et al., 2022).

Third, the challenges brought by the COVID-19 pandemic (e.g., supply chain bottlenecks and operational restrictions) and its subsequent recovery efforts may inflate or deflate the true effect of entrepreneurial competency on business growth. Besides, their perception of government intervention and support programs during the crisis may influence some minor shifts in their locus of control. In this regard, future research can examine the impact of government support and entrepreneurs' ability to cope with the challenges to their competency, career, and life outcomes. We also encourage researchers to incorporate other relevant and unique variables to add some theoretical values to the existing model, such as entrepreneurial passion (Li et al., 2020), market-oriented behaviors (Crick, 2021), proactive service behavior (Hamzah et al., 2020), and cognitive flexibility (Jiatong et al., 2021), to name a few.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors upon formal request, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

MH conceptualized the study's theoretical framework and analyzed the data and wrote the original draft of the manuscript. AO secured the funding *via* a national grant, designed the research methods, facilitated the data collection process, and reviewed and edited the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Appendix

TABLE A1 Loadings and cross-loadings.

	ILC	ELC	RELAT	INNOV	ANALYT	OPSEEK	BG	QoL	INT
ILC2	**0.703**	0.078	0.183	0.174	0.167	0.306	0.009	0.162	0.186
ILC3	**0.779**	0.094	0.309	0.227	0.309	0.244	0.211	0.274	0.305
ILC4	**0.712**	0.169	0.278	0.198	0.231	0.352	0.106	0.286	0.220
ILC5	**0.687**	0.204	0.165	0.081	0.102	0.280	0.020	−0.028	0.181
ELC1	0.300	**0.714**	−0.013	0.025	0.083	0.225	−0.160	−0.025	0.061
ELC3	0.163	**0.790**	−0.027	0.043	0.122	0.219	−0.043	0.052	0.108
ELC4	−0.003	**0.675**	−0.098	0.080	0.006	0.208	−0.179	0.039	0.017
ELC5	0.026	**0.727**	0.024	0.116	0.047	0.212	−0.131	0.036	−0.146
REL1	0.013	−0.162	**0.517**	0.254	0.345	0.214	−0.020	0.352	0.464
REL2	0.330	−0.114	**0.829**	0.403	0.509	0.332	0.210	0.405	0.235
REL3	0.222	−0.081	**0.854**	0.419	0.523	0.396	0.167	0.429	0.399
REL4	0.270	0.005	**0.631**	0.343	0.401	0.209	0.188	0.287	0.176
REL5	0.264	0.152	**0.685**	0.333	0.387	0.454	0.135	0.292	0.214
REL6	0.323	0.073	**0.775**	0.367	0.372	0.385	0.247	0.439	0.179
INV1	0.135	0.019	0.446	**0.820**	0.654	0.510	0.121	0.280	0.339
INV2	0.207	0.139	0.388	**0.862**	0.673	0.501	0.127	0.249	0.142
INV3	0.292	0.071	0.426	**0.875**	0.688	0.533	0.101	0.232	0.269
AN1	0.320	0.097	0.476	0.614	**0.854**	0.667	0.292	0.432	0.362
AN2	0.251	0.071	0.543	0.720	**0.909**	0.568	0.220	0.479	0.196
AN3	0.272	0.092	0.432	0.630	**0.775**	0.419	0.122	0.419	0.359
AN4	0.189	0.080	0.560	0.737	**0.887**	0.543	0.252	0.406	0.304
OP1	0.380	0.248	0.408	0.519	0.502	**0.914**	0.161	0.222	0.323
OP2	0.279	0.285	0.425	0.469	0.502	**0.888**	0.209	0.241	0.222
OP3	0.355	0.262	0.399	0.536	0.580	**0.922**	0.257	0.268	0.279
OP4	0.432	0.258	0.433	0.617	0.698	**0.843**	0.226	0.325	0.383
BG1	0.179	−0.065	0.173	0.091	0.172	0.111	**0.714**	0.213	0.170
BG2	0.111	−0.120	0.174	0.086	0.177	0.188	**0.930**	0.235	−0.010
BG3	0.165	−0.148	0.219	0.145	0.250	0.288	**0.957**	0.314	0.115
BG4	0.060	−0.215	0.218	0.145	0.301	0.227	**0.932**	0.334	0.140
QoL1	0.241	−0.003	0.411	0.314	0.428	0.204	0.194	**0.794**	0.343
QoL2	0.268	−0.083	0.499	0.173	0.416	0.213	0.393	**0.838**	0.282
QoL3	0.116	0.048	0.356	0.261	0.402	0.313	0.281	**0.843**	0.258
QoL4	0.244	0.014	0.409	0.172	0.351	0.276	0.221	**0.793**	0.410
QoL5	0.210	0.182	0.313	0.247	0.389	0.159	0.136	**0.646**	0.165
INT1	0.370	0.031	0.390	0.283	0.360	0.290	0.152	0.441	**0.867**
INT2	0.246	−0.033	0.303	0.266	0.255	0.233	0.086	0.324	**0.929**
INT3	0.282	0.010	0.373	0.286	0.335	0.346	0.074	0.318	**0.963**
INT4	0.265	0.014	0.301	0.245	0.331	0.376	0.119	0.289	**0.931**

ILC=Internal locus of control; ELC = External locus of control; RELAT = Relational; INNOV=Innovative; ANALYT = Analytical; OPSEEK=Opportunity seeking; ENTCOMP = Entrepreneurial competency; BG = Business growth; QoL = Quality of life; INT = Sustainable entrepreneurial intention.

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Psychological and sociological determinants of entrepreneurial intentions and behaviors

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Research concerned with the personality of entrepreneurs entails an important part of the research into the management of small and medium-sized enterprises and entrepreneurship. This research has added new knowledge about the role of entrepreneurs' personality characteristics, their family entrepreneurial background, and the local supportive entrepreneurial background in entrepreneurial start-up intentions and behaviors. Hypotheses and a model were developed and verified using structural equation modeling and regression analysis considering data from a sample of entrepreneurs and students. This research revealed that several personality and sociological factors can be important for entrepreneurship when it comes to starting a business. The most important were the Big Five personality factors openness, extraversion, and non-agreeableness and, to a smaller extent, emotional stability (non-neuroticism), and conscientiousness. The second-most important group of factors were the specific motivational characteristics entrepreneurial self-efficacy, internal locus of control, and risk-taking propensity. Sociological factors were much less important than psychological elements for establishing business.

KEYWORDS

personality characteristics, sociological background, small and medium-sized enterprises, entrepreneur, entrepreneurship, start-ups

Introduction

Entrepreneurship is an individual-level or an organizational-level behavioral phenomenon and incorporates the creation and management of new businesses, small businesses, and family businesses, as well as the characteristics and special problems of entrepreneurs (Antončič, 2020). Research on the personality of managers of small and medium-sized enterprises (SMEs) and entrepreneurs is an important part of entrepreneurship and SMEs research. Views on entrepreneurs' key personality characteristics are observable in research works in English (e.g., McClelland, 1961; Brockhaus, 1982; Baum et al., 2007; Rauch and Frese, 2007; Chell, 2008; Antončič et al., 2015; Salmony and Kanbach, 2022) and in other languages (e.g., in Slovenian: Petrin and Antončič, 1995; Antončič et al., 2002; Ruzzier et al., 2008). Alongside specific personality characteristics that have been primarily researched (e.g., need for achievement, internal locus of control, propensity to take risks, need for independence) and other approaches to specific personality characteristics (e.g., entrepreneurial self-efficacy), an approach to personality characteristics that is based on general personality characteristics (Big Five personality factors: openness, conscientiousness, extraversion, agreeableness, and neuroticism; Goldberg, 1981, 1990; Costa Jr. and McCrae, 1985) is seen as an area holding potential to connect personality characteristics with entrepreneurial activities (Singh and DeNoble, 2003; Antončič et al., 2008, 2015). After a comprehensive review of entrepreneurial personality, Baum et al. (2007) and Chell (2008) called for additional research into the personality of entrepreneurs and managers of SMEs. Rauch and Frese (2007) presented their previously developed

model (Rauch and Frese, 2000) of the entrepreneur's personality and success, which includes two groups of personality characteristics: broad personality characteristics (extraversion, emotional stability, openness to experience, agreeableness, and conscientiousness) and specific personality characteristics (need for achievement, risk-taking propensity, innovativeness, autonomy, locus of control, and self-efficacy). Rauch and Frese (2007) outlined the results of a meta-analysis on the relationship between personality characteristics and company success: broad (general) personality characteristics were related to success with $r = 0.151$, while specific personality characteristics were related to success with $r = 0.231$. Širec and Močnik (2010) discovered the partial consistency of the hypothesis about the connection of psychological motivational factors (need for achievement, risk-taking propensity, need for independence, self-image, self-efficacy, locus of control, and vision) with the growth of Slovenian companies. Antončič and Auer Antončič (2016) found a partial association of specific motivational personality characteristics (internal locus of control, entrepreneurial self-efficacy, need for achievement, need for independence, and propensity to take risks) of Slovenian entrepreneurs with the technological development and innovativeness of their companies. Salmony and Kanbach (2022) noted that personality traits (e.g., the Big Five, risk attitudes, locus of control, entrepreneurial self-efficacy, innovativeness, need for achievement) are crucial in entrepreneurship.

Research on entrepreneurs' sociological characteristics is also an important part of the field of SME management and entrepreneurship. Shapero and Sokol (1982) emphasized that sociological and cultural factors may be important in the creation of entrepreneurial events and are most felt in the establishing of individual value systems. Business start-ups may depend on the presence of entrepreneurs as parents or siblings and on higher education (Dombrovsky and Welter, 2010). Schenkel et al. (2013) examined family entrepreneurial background and found no relationship with entrepreneurial intentions, although their study was limited by the use of a single-question measure to measure family entrepreneurial background. In this research, the association between family entrepreneurial background and entrepreneurship was assessed using a measure of family entrepreneurial background that includes various members of the family entrepreneurial environment (parents, grandparents, and siblings). Perceptions of the desirability and possibility of entrepreneurship in the entrepreneurial environment may be important for the establishment of firms (Krueger, 1993). Mentors and role models (Hisrich et al., 2013) and perceptions of opportunity and necessity (Reynolds et al., 2005; Wong et al., 2005) can also be important for a start-up and hence the characteristics of the local entrepreneurial background were also considered in this research.

Although there is evidence of a link between the Big Five personality traits and entrepreneurial intentions (e.g., Murugesan and Jayavelu, 2017; Şahin et al., 2019; Sahinidis et al., 2020) and entrepreneurship (intentions and behaviors, Antončič et al., 2015), the links between the Big Five personality traits of entrepreneurs, their family entrepreneurial background, and a local supportive entrepreneurial background, and business start-ups in a single model are lacking, so the past research did not identify, which of these personality or sociological elements could be more important for entrepreneurial intentions and behaviors in a model. This represents a gap in past research on SME management and entrepreneurship. The past research established that personality factors (e.g., Antončič et al., 2015; Murugesan and Jayavelu, 2017; Şahin et al., 2019; Sahinidis et al., 2020; Salmony and Kanbach, 2022), family entrepreneurial background (e.g., Dombrovsky and Welter, 2010; Schenkel et al., 2013; Georgescu and Herman, 2020), and the local supportive entrepreneurial background (e.g., Reynolds et al., 2005; Wong et al., 2005; Hisrich et al., 2013) are supportive elements to start a business, however from a theoretical and a practical viewpoint an examination of a relative importance of these factors for business start-up intentions and behaviors is lacking. In addition, Salmony and Kanbach (2022) pointed out a lack of research on the Big Five and entrepreneurship using actual entrepreneurs as participants. In this research, we added new knowledge about the role of personality characteristics of entrepreneurs, their family entrepreneurial background, and the local supportive entrepreneurial background in the establishing of companies. We thereby filled the gap in SME entrepreneurship and management research related to personality and sociological background in connection with the setting up of companies and expanded the research on personality and sociological background in entrepreneurship.

Salmony and Kanbach (2022) reviewed works on personality differences across different types of entrepreneurs and concluded that future studies need to conduct more systematic inquiries into the distinctions between sub-types of entrepreneurs and use evidently stated entrepreneurial samples. In this research, we examined effects of personality and sociological factors on entrepreneurship in terms of entrepreneurial intentions (persons with or without intentions to establish an enterprise) and entrepreneurial behaviors (actual entrepreneurs–founders and managers of SMEs).

Theory and hypotheses

Work on developing a taxonomy of personality characteristics (Allport and Odbert, 1936; Cattell, 1943, 1945; Norman, 1967; Goldberg, 1981, 1990) led to the foundation of the Big Five factors with the initials OCEAN (Costa Jr. and McCrae, 1985), referring to the following (John, 1990, in Carducci, 1998, p. 239): the O factor: openness, originality, receptivity; the C factor: conscientiousness, control, constraint; the E factor: extroversion, energy, enthusiasm; the A factor: adaptability, agreeableness, altruism, adherence; the N factor: neuroticism, negative emotions, nervousness. The Big Five factors portray a relatively stable personality picture in adult persons (Schwaba and Bleidorn, 2018). Enterprises functioning mostly under the learning by doing-using-interacting mode can gain from owners' Big Five personality characteristics (Runst and Thoma, 2022).

McClelland (1961) found that when we compare them with the population it is typical for entrepreneurs to not like repetitive and routine work, which can be classified as an openness factor. Several studies examining the entrepreneurship–openness relationship have determined that openness is a characteristic factor (Howard and Howard, 1995; Singh and DeNoble, 2003; Antončič et al., 2008, 2015). Openness of the entrepreneur and their creative personality may be important for the entrepreneur's creativity and the growth of their firm (Peljko and Auer Antončič, 2022). Openness can be a very important factor for entrepreneurs because it plays a key role in the process of identifying an entrepreneurial opportunity. The tendency to act is a key element of entrepreneurship. Entrepreneurs pursue opportunities and turn ideas into profitable businesses. Identifying business opportunities may be considered one of the essential tasks that entrepreneurs are involved in during the entrepreneurial process, as well as the most fundamental task while beginning to create a new business. Opportunity recognition is accordingly the starting point of the entrepreneurial process (Baron, 2007). Discovery theory of

entrepreneurial action assumes that entrepreneurs differ from non-entrepreneurs in their ability to see and exploit opportunities (Alvarez and Barney, 2007). The discovery and exploitation of opportunities are integral parts of the entrepreneurial process (Shane and Eckhardt, 2005). The openness factor can be the most important of the Big Five factors for distinguishing entrepreneurs from other individuals (Antončič et al., 2015):

> *H1a*: A person's openness is positively related to entrepreneurship in terms of starting a business.

McClelland (1961) found that entrepreneurs (compared to the population) score higher on need for achievement (the desire to do well). They take personal responsibility for their decisions, prefer decisions that involve moderate risk, dislike repetitive routine work, and are interested in concrete knowledge concerning the results of decisions. If we compare the content of these characteristics with the content of the Big Five factors, we can perceive the need for achievement as a personality characteristic of conscientiousness. The conscientiousness factor was shown not to separate between entrepreneurship-defining groups (Antončič et al., 2015), but Howard and Howard (1995) established that a high level of conscientiousness can be characteristic of an entrepreneurial type of person:

> *H1b*: A person's conscientiousness is positively related to entrepreneurship in terms of starting a business.

Howard and Howard (1995) determined that the entrepreneurial type can also be described as high in extraversion. A lower level of extraversion was found for non-entrepreneurs compared to entrepreneurs (Antončič et al., 2015):

> *H1c*: A person's extroversion is positively related to entrepreneurship in terms of starting a business.

Howard and Howard (1995) considered the entrepreneurial type to be average in agreeableness and a clear link between agreeableness and entrepreneurship thus cannot be expected. The dark side (Kets de Vries, 1985) could prevail, as seen in a study by Zhao et al. (2005) who reported that entrepreneurs had lower acceptance scores than managers. Agreeableness can be positively related to non-entrepreneurship (Antončič et al., 2015):

> *H1d*: A person's agreeableness is negatively related to entrepreneurship in terms of starting a business.

A personality characteristic of Western society may be unemotionality, which is important for personal success (Ryckman, 2000), suggesting the possibility of a negative association between neuroticism (the opposite of emotional stability) and entrepreneurship. Singh and DeNoble (2003) found a negative relationship between neuroticism and views of self-employment in terms of intention and perceived ability. Antončič et al. (2015) showed that the neuroticism factor might not distinguish entrepreneurs from non-entrepreneurs. The results of Goldberg (1990) support a possible negative neuroticism–entrepreneurship relationship because emotionally stable people are characterized by autonomy, independence, and individualism. Autonomy or independence may be related to entrepreneurship by serving as an important motivator (Collins and Moore, 1964; Licht and Siegel, 2006). Entrepreneurs can be somewhat neurotic (Lynn, 1969; Kets de Vries, 1977):

> *H1e*: A person's neuroticism is negatively related to entrepreneurship in terms of starting a business.

The forming of a new firm may depend decisively on family members as support persons and role models (Hisrich, 2013; Hisrich et al., 2013). The family business environment is important in entrepreneurship and can have effects on financial self-efficacy in certain economic milieus (Antončič et al., 2021). Lee et al. (2021) revealed that entrepreneurial family background of students strengthens the impact of entrepreneurship education on entrepreneurial passion for starting a company. Marques et al. (2018) studied entrepreneurship educations and discovered gender and family background variables as moderators with a positive impact on individual entrepreneurial orientation of students. Mitrovic Veljkovic et al. (2019) pointed out that family entrepreneurship background is important for entrepreneurial preferences of students. Georgescu and Herman (2020) found relationships between entrepreneurial family background, entrepreneurial personality traits, effectiveness of entrepreneurship education, and entrepreneurial intentions of students. One of the key driving elements of the sociological background for entrepreneurship can be family entrepreneurial experiences (Shapero and Sokol, 1982).

> *H2a*: A person's family entrepreneurial background is positively related to entrepreneurship in terms of starting a business.

The possibility and desirability of an entrepreneurial profession can be signaled through an entrepreneur's environment (Shapero and Sokol, 1982; Antončič et al., 2002; Ruzzier et al., 2008; Hisrich et al., 2013). Entrepreneurial self-efficacy and entrepreneurial motivation can be developed based on community-level cultural norms (performance-based culture and socially supportive institutional norms) and can lead to the formation of new ventures (Hopp and Stephan, 2012). A person's decision to become an entrepreneur can depend on a positive attitude to entrepreneurship (e.g., contact with entrepreneurs, the social desirability, regard, and reputation of entrepreneurs in society; Rebernik et al., 2014). Role models can impact entrepreneurial intentions and behaviors (Abbasianchavari and Moritz, 2021). Personal decisions about establishing a new firm can depend on friends, advisors, and support persons in the local neighborhood of an entrepreneur, and on a positive, opportunity-oriented, and encouraging environment (Hisrich, 2013; Hisrich et al., 2013).

> *H2b*: A person's local entrepreneurial support background is positively related to entrepreneurship in terms of starting a business.

Research methods

Participants

Data for this study were obtained through an online survey questionnaire. The data were collected from 366 entrepreneurs and non-entrepreneurs in Slovenia, namely electronically based on a representative sample of managers of Slovenian SMEs (128 usable answers) and in writing based on a purposeful sample of undergraduate business

TABLE 1 Characteristics of participants.

Characteristic		Frequency	Percent
Gender	Male	178	48.6
	Female	188	51.4
	Total	366	100.0
Age (in years)	20 or less	37	10.1
	Over 20 to 30	203	55.5
	Over 30 to 40	24	6.6
	Over 40 to 50	39	10.7
	Over 50	63	17.2
	Total	366	100.0
Status/base	Student	238	65.0
	SME manager	128	35.0
	Total	366	100.0

students at the School of Economics and Business of the University of Ljubljana (238 usable answers). Characteristics of participants are displayed in Table 1. Among the respondents, 33.6% were active entrepreneurs, 13.1% potential entrepreneurs, 41.5% possible entrepreneurs, and 11.7% non-entrepreneurs. By gender, there were slightly more women (51.4%) than men (48.6%), while there were fewer women among the managers. By age, there were more younger people (20 years or less 10.1%, over 20 to 30 years 55.5%, over 30 to 40 years 6.6%, over 40 to 50 years 10.7%, over 50 years 17.2%), whereas the managers were older than the students. Due to the differences between the two sub-samples, an additional control variable sub-sample (1–managers, 0–students) was introduced. Smaller companies dominated among the managers' companies (number of employees by full-time equivalent: up to and including 10 66.4%, 11–50 28.1%, 51–250 5.5%; total sales in the previous year: EUR 400,000 or less 42.2%, over EUR 400,000 to EUR 800,000 18.0%, over EUR 800,000 to EUR 1,600,000 16.4%, over EUR 1,600,000 to EUR 4,000,000 14.8%, over EUR 4,000,000 8.6%), aged 11 to 50 years (82.9%), in service industries (81.9%; 18.1% were manufacturing companies).

Instrument

The model's elements and questions for the measurement questionnaire were conceptually developed mainly based on questions from past research. First, general personality characteristics (the Big Five factors) were assessed as measured by Singh and DeNoble (2003) and Antončič et al. (2008, 2015), who used Saucier's (1994) Mini-Markers Inventory, which includes 8 adjectives for each personality factor: (1) openness–adjectives: creative, imaginative, philosophical, intellectual, complex, deep, non-creative (r), non-intellectual (r); (2) conscientiousness–adjectives: organized, efficient, systematic, practical, disorganized (r), sloppy (r), inefficient (r), carefree (r); (3) extraversion–adjectives: talkative, extroverted, bold, energetic, reserved (r), quiet (r), shy (r), introverted (r); (4) agreeableness–adjectives: sympathetic, warm, friendly, cooperative, cold (r), unsympathetic (r), rough (r), strict (r); (5) neuroticism–adjectives: unenvious (r), relaxed (r), capricious, jealous, temperamental, envious, sensitive, irritable. Respondents were asked about their level of agreement with 40 adjectives on a Likert-type scale with anchors ranging from 1–does not apply very much to 5–applies very much. The Big Five personality factors showed a satisfactory to very good level of reliability (Cronbach's alpha: Openness 0.74, Conscientiousness 0.77, Extraversion 0.81, Agreeableness 0.73, Neuroticism 0.66–two questions eliminated: non-envious, relaxed).

Second, the sociological background was measured with 17 questions on a Likert-type scale with anchors ranging from 1–strongly does not apply to 5–strongly applies. Seven questions measured family entrepreneurial background: my father is or was an entrepreneur, my mother is or was an entrepreneur, my grandparents are or were entrepreneurs, my great-grandparents and/or their ancestors were entrepreneurs, my brothers or sisters are or were entrepreneurs, there are many entrepreneurs in my extended family, and I was brought up in an environment of family entrepreneurship. Ten questions measured the local entrepreneurial support background: I personally know many entrepreneurs, my friends are entrepreneurs, my advisors are entrepreneurs, my role models are entrepreneurs, I grew up in a neighborhood with a large number of entrepreneurs, I grew up in a neighborhood that was very supportive of entrepreneurs, I grew up in a neighborhood that forced individuals into entrepreneurship, I grew up in an environment where entrepreneurship was seen as an opportunity, I grew up in an environment where entrepreneurship was seen as a necessity, and I grew up in a positive environment for entrepreneurship. The level of reliability was very good for family entrepreneurial background (Cronbach's alpha 0.83) and local entrepreneurial support background (Cronbach's alpha 0.81).

The final dependent variable–entrepreneurship (purposes and activities) in terms of starting a business–was assessed with the measure from Antončič et al. (2007): entrepreneurs (actual business), potential entrepreneurs (intention to start a business in the next 3 years), possible entrepreneurs (who could start a business in the future), and non-entrepreneurs (who do not intend to start a business). Entrepreneurship variables are shown in Table 2. The first variable was designed based on this classification of business creations or entrepreneurship in four ascending classes (1–non-entrepreneurs, 2–possible entrepreneurs, 3–potential entrepreneurs, and 4–actual entrepreneurs). The second variable was designed to distinguish actual entrepreneurs (1) from others (0). Potential entrepreneurs are usually more similar to actual entrepreneurs (Antončič et al., 2015) and hence, the third variable was coded as 1–entrepreneurs (actual and potential) and 0–non-entrepreneurs (possible entrepreneurs and non-entrepreneurs). In the structural modeling, the third variable was primarily used and, where possible, a construct consisting of all three variables was also used. In the regression analysis, a summary variable (arithmetic mean calculated based on the second and third variables).

Measures of specific motivational personality characteristics and other control variables were also included in the questionnaire. Alongside the Big Five, the key personality correlates of entrepreneurship comprise specific personality characteristics (Antončič, 2020): internal locus of control, entrepreneurial self-efficacy, need for achievement, need for independence, and risk-taking propensity, so they were included as control variables. Specific motivational personality characteristics were measured with the following questions (on a Likert-type scale with anchors from 1–very much not true to 5–very much true): Internal locus of control included a question, I have control over my destiny, and five questions from Chen et al. (1998): I can usually protect my personal interests; my life is determined by my own actions; I can pretty much determine what will happen in my life; what I plan I almost certainly make work; when I get what I want, it's usually because I worked really hard for it. The level of reliability of the internal locus of the control construct was satisfactory (Cronbach's alpha 0.69). Entrepreneurial self-efficacy consisted of five questions: I am capable of successfully

TABLE 2 Entrepreneurship variables.

Varable		Frequency	Percent
Entrepreneurship 1	1: No intention (non-entrepreneur)	43	11.7
	2: Low intention (maybe-entrepreneur)	152	41.5
	3: High intention (potential entrepreneur)	48	13.1
	4: Behavior (actual entrepreneur)	123	33.6
	Total	366	100.0
Entrepreneurship 2	0: Non-entrepreneur (no enterprise)	243	66.4
	1: Entrepreneur (enterprise)	123	33.6
	Total	366	100.0
Entrepreneurship 3	0: Non-entrepreneur (no/low intention)	195	53.3
	1: Entrepreneur (potential/actual)	171	46.7
	Total	366	100.0

implementing marketing; I am capable of successful implementation of innovations; I am capable of successful implementation of management; I am capable of successfully taking risks; I am able to successfully implement financial control. These five questions are consistent with the definition of entrepreneurial self-efficacy given by Chen et al. (1998), yet also contain fewer questions than the measure of these authors. The level of reliability of the entrepreneurial self-efficacy construct was very good (Cronbach's alpha 0.81). The need for achievement was measured by one question: I have a desire for achievement, from Antončič and Auer Antončič (2011). The need for independence entailed one question: I have a desire for personal independence, from Gantar et al. (2013). Risk-taking propensity was measured with two questions from Auer Antončič et al. (2018a): I like to take risks; I am risk-averse. The two risk-taking propensity questions were highly correlated (Pearson's correlation coefficient 0.71, sig. 0.000). Measures for other control variables (person-related: gender and age; company-related: industry, age, and size) were assessed following Auer Antončič et al. (2018b).

Procedure

The data analysis was quantitative. The constructs were verified by exploratory (tool used: SPSS) and confirmatory factor analysis (tool: EQS). The hypotheses and the model were verified using structural equation modeling (tool: EQS) and regression analysis (tool: SPSS). Structural equation modeling used latent factors determined based on measurement variables for each construct. In the regression analysis, the variables were calculated as arithmetic means of the measurement variables for each construct.

Common method bias was verified *via* Harman's (1976) one-factor test, which did not indicate a presence of common method bias (the total variance explained by a single factor was 16.2%, which is well under the 50% threshold of Podsakoff and Organ, 1986).

Empirical results

Structural equation modelling results

We tested a structural equation model that included the Big Five personality factors and two sociological entrepreneurial environment factors as independent factors and entrepreneurship in terms of starting a business as a dependent factor. Before the structural equation model was estimated, each construct was tested by using exploratory and confirmatory factor analysis, which indicated adequate results in terms of convergent validity, discriminant validity, composite reliability, and factor loadings (positive and significant). The structural equation model is shown in Figure 1. The model was checked using the data of 295 persons (we skipped 71 out of 366 due to them missing at least one item in the response). The model had a very good fit and reliability (NFI 0.97, CFI 0.98, RMSEA 0.075, and Cronbach's alpha 0.81). It predicted 27.2% of the variance in the dependent factor of business start-up (determined by the three start-up variables). The statistically significant standardized coefficients shown in Table 3 are consistent with the hypotheses for four personality factors (openness, H1a; extraversion, H1c; agreeableness, H1d; neuroticism, H1e), and statistically insignificant, but in the right direction, for one personality factor (conscientiousness, H1b) and two factors of entrepreneurial sociological background (family entrepreneurial background, H2a; local entrepreneurial support background, H2b).

By introducing person-level control variables (specific motivational personality characteristics) in a regression model predicting business start-ups without sociological factors, two were found to be statistically significant (entrepreneurial self-efficacy, need for achievement) and positively related to business start-ups. The proportion of explained variance in the dependent variable of business creation was significant (14.7%), but not considerably higher than in the model without these control variables. Here, the connections between openness and founding and neuroticism and founding became statistically less significant (sig. < 0.10) compared to the results in Table 3.

Regression analysis results

The multiple regression analysis supported the results of the structural equation modeling. The regression model predicted 14.0% of the variance in the dependent factor of business start-up (determined by the average start-up variable). The statistically significant standardized coefficients presented in Table 4 are consistent with the hypotheses for four personality factors (openness, H1a; extraversion, H1c; agreeableness, H1d; neuroticism, H1e), and one entrepreneurial sociological background factor (local entrepreneurial support

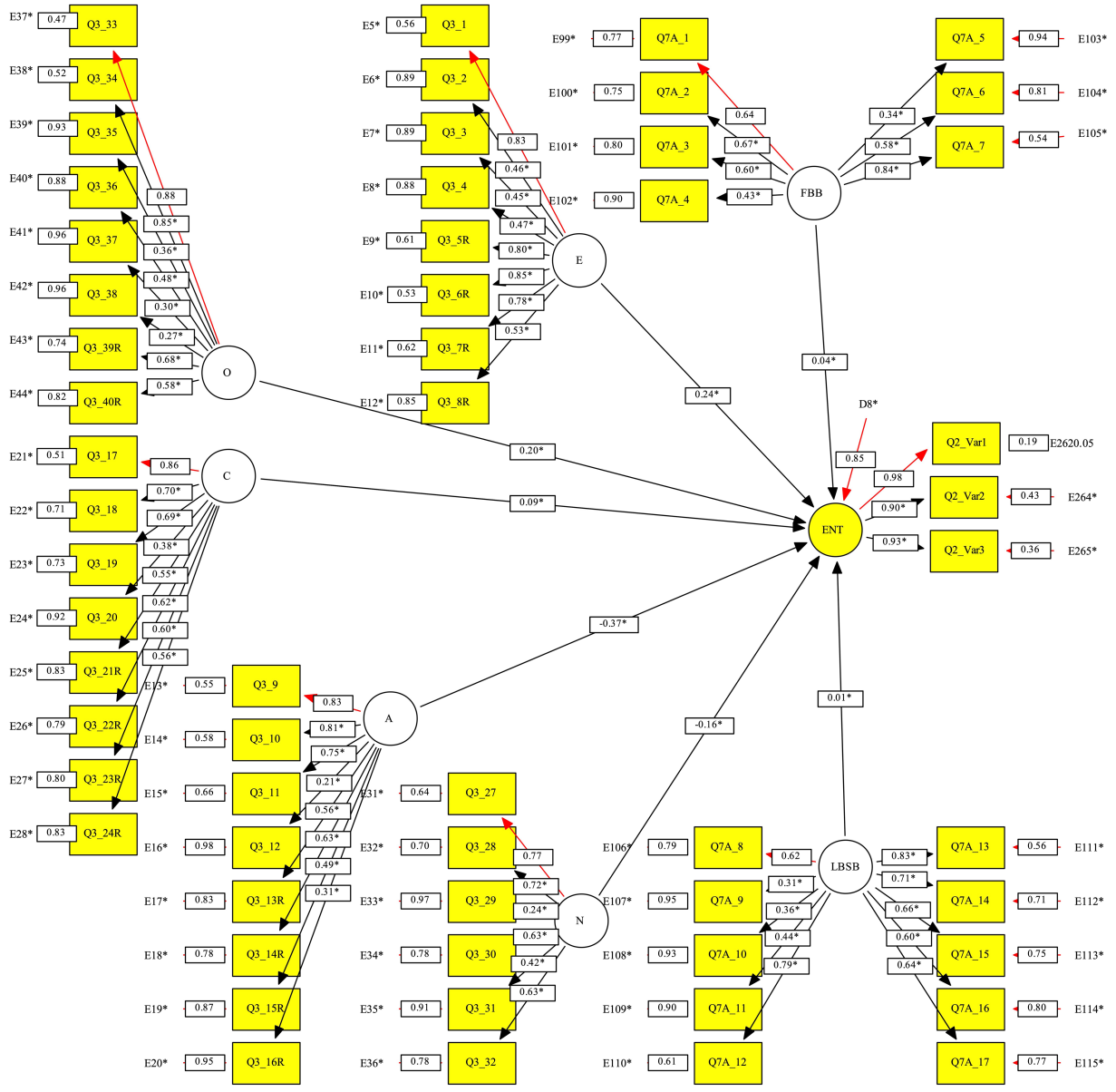

FIGURE 1
The model of the Big Five factors of personality, sociological entrepreneurial background, and establishment of companies (structural equation modeling, standardized solution). ENT, Entrepreneurship in terms of starting a business; O, Openness; C, Conscientiousness; E, Extraversion; A, Agreeableness; N, Neuroticism; FBB, Family business background; LBSB, Local business support background; Qx, items; Ex, errors; D, disturbance; *, estimated parameters.

TABLE 3 The model of the big five factors of personality, sociological entrepreneurial background, and establishment of companies (structural equation modeling).

Independent factor	Standardized coefficient
Openness	0.198*
Conscientiousness	0.088
Extraversion	0.245*
Agreeableness	−0.372*
Neuroticism	−0.158*
Family business background	0.038
Local business support background	0.015

Dependent factor: Entrepreneurship in terms of starting a business. Coefficient of determination: 0.272. *$p < 0.05$.

background, H2b), and are statistically non-significant, but in the right direction, for one personality factor (conscientiousness, H1b), whereas statistically non-significant and not in the right direction for one factor of entrepreneurial sociological background (family entrepreneurial background, H2a).

By introducing person-level control variables (gender and age) in a regression model predicting business start-ups, both were determined to be statistically significant (age positively related: older people related to start-ups more than younger people; gender: men related to start-ups more than women). The proportion of explained variance in the dependent variable of business establishment was high (62.4%), also indicating a strong effect of age and gender. Here, the connections between openness and start-ups and neuroticism and start-ups became statistically non-significant, while the connection between family

TABLE 4 The model of the big five factors of personality, sociological entrepreneurial background, and establishment of companies (multiple regression analysis).

Independent variable	Standardized coefficient
Openness	0.119*
Conscientiousness	0.065
Extraversion	0.160*
Agreeableness	−0.214*
Neuroticism	−0.112*
Family business background	−0.064
Local business support background	0.150*

Dependent variable: Entrepreneurship in terms of starting a business. Coefficient of determination: 0.140. *$p < 0.05$.

entrepreneurial background and start-ups became statistically significant compared to the results in Table 4.

We also performed simple regression analyses and correlation analyses (results identical in content) to identify bivariate associations between variables that were obscured (reduced levels of association) due to multicollinearity. Statistically significant relationships of entrepreneurship in terms of starting a business were found with the following variables (correlation coefficients in parentheses): openness (0.211), conscientiousness (0.156), extraversion (0.235), agreeableness (−0.164), entrepreneurial self-efficacy (0.168), internal locus of control (0.243), risk-taking propensity (0.110), gender (0.747), industry (−0.390), total sales in the past year (−0.259), base (0.800). These results reveal a bivariate association of four of the five personality factors (consistent with hypotheses H1a, H1b, H1c, and H1d) and several control variables with the establishment of a business.

Discussion, contributions, and implications

This research showed that several personality and sociological factors can be important for entrepreneurship when it comes to starting a business. First, the most important were the Big Five personality factors openness, extraversion, and non-agreeableness, and to a smaller extent emotional stability (non-neuroticism) and conscientiousness. These results for openness, extraversion, and non-agreeableness are in line with findings of Antončič et al. (2015) and partially comparable to their findings for conscientiousness and neuroticism, because Antončič et al. (2015) showed that the conscientiousness factor and the neuroticism factor might not distinguish entrepreneurs from non-entrepreneurs.

The second-most important factors were the specific motivational characteristics entrepreneurial self-efficacy, internal locus of control, and risk-taking propensity. These results are: (1) congruent with past studies (e.g., Antončič, 2020; Salmony and Kanbach, 2022) for the three characteristics (entrepreneurial self-efficacy, internal locus of control, and risk-taking propensity); and (2) contradictory to Salmony and Kanbach (2022) for the need for achievement, and to Antončič (2020) for the need for achievement and the need for independence. The use of different specific motivational characteristics in this study, enabled us to find, which specific characteristics can be more important than other characteristics. These peculiar results warrant further investigation in future studies.

Third, sociological factors were much less important than psychological elements for establishing a business, yet entrepreneurial local support background showed some effect. Interestingly, the finding that a person's family entrepreneurial background is not related to entrepreneurship (in terms of starting a business) contradicts findings of past studies based on students (e.g., Marques et al., 2018; Mitrovic Veljkovic et al., 2019; Georgescu and Herman, 2020; Lee et al., 2021) and confirms the notion that actual entrepreneurs need to be included as respondents in entrepreneurship research (Salmony and Kanbach, 2022).

Fourth, a person's age (and the role of an entrepreneur vs. a student) and gender, and a company's industry and sales were shown as essential control variables related to business start-ups. The person's age result (age positively related to entrepreneurship: older people related to start-ups more than younger people) contradicts past studies (e.g., Krueger and Brazeal, 1994; Levesque and Minniti, 2006; Singh, 2014), which indicated a negative relationship (younger persons should have higher entrepreneurial intention than older persons). The person's age result of our study may be related to the characteristics of the sample: students were younger and less entrepreneurial than SME managers. The positive relationship between gender and entrepreneurship (men related to start-ups more than women) is aligned with past research (e.g., Shinnar et al., 2012; Strobl et al., 2012; Singh, 2014; Antončič et al., 2015). The results related to company-level controls (industry and sales) may be less revealing because they are based solely on the sub-sample of SME managers.

The main scientific contribution of this research is the theoretically developed and empirically verified new model containing personality characteristics and the characteristics of the sociological background that encouraged business start-ups, which includes personality variables (Big Five personality factors), family entrepreneurial and local support background variables, and specific personality and demographic control variables. Following the suggestions of Antončič et al. (2015) and somewhat less so the findings of Rauch and Frese (2000, 2007), we found that the Big Five are the most important for starting companies, with specific motivational personality characteristics also being important, and sociological factors being less important. This study contributes to past research on entrepreneurial personality (e.g., Antončič et al., 2015; Murugesan and Jayavelu, 2017; Şahin et al., 2019; Sahinidis et al., 2020; Salmony and Kanbach, 2022) and sociological determinants of entrepreneurship (family entrepreneurial background, e.g., Dombrovsky and Welter, 2010; Schenkel et al., 2013; Marques et al., 2018; Mitrovic Veljkovic et al., 2019; Georgescu and Herman, 2020; Lee et al., 2021; local supportive entrepreneurial background, e.g., Reynolds et al., 2005; Wong et al., 2005; Hisrich et al., 2013) by developing the model and providing evidence about the relative importance of psychological and sociological factors for business start-up intentions and behaviors. This study contributes in terms of methodology to research on the Big Five personality characteristics and entrepreneurship (e.g., Murugesan and Jayavelu, 2017; Şahin et al., 2019; Sahinidis et al., 2020; Salmony and Kanbach, 2022) by using a sub-sample of actual entrepreneurs and three variables of entrepreneurship. The research has implications for theory. Entrepreneurship researchers should include both psychological and sociological variables in their models, use control variables (age and gender), various entrepreneurship variables, and samples or sub-samples of actual entrepreneurs.

The research holds implications for practice. Suggestions for people who would like to commence a business: Starting a business should be a challenge for both younger and older people. The elderly should not feel too old to start a business because they can be a rich source of knowledge and experience. Younger people should accept the support of older

people in starting a company, or young people who can be motivated and full of work zeal should also start a company. It is recommended that older people help them in this and in so doing combine knowledge, work experience, and drive since research shows that older people are more connected to start-ups than younger ones. Companies should also be founded by women, despite the results of this research revealing that men are more associated with establishing them than women.

We recommend the establishment of a company primarily to open, extroverted, and less agreeable individuals, and for an easier entrepreneurial start for those who are not we suggest that they connect with open, extroverted, and less agreeable people when establishing and making the main decisions while managing the company, as it has been shown that openness, extroversion, and non-agreeableness can be important for starting a business. If a person likes new things, is creative, original, imaginative, innovative, and eager for change, they will most likely know what they want to do, they will be sure that they want to realize their ideas, and it will be easier to become an entrepreneur. New ideas and alternatives can enable diversity and business expansion. For the founder of a company, it is very important that they are open as a person; namely, intellectual and complex. An individual could even improve their personality characteristics to some extent through training and coaching because a person's Big Five personality characteristics are partly learned and partly innate (Antončič, 2009; Auer Antončič, 2012).

A person who is lively, full of energy, active, cheerful, dominant, bold, and unwavering will most likely establish contact with the outside public more easily and thus deal with the establishment of the company's operations more easily and quickly. For persons who are communicative, sociable, ambitious, determined, spontaneous, adventurous, cheerful, connecting, and open to new people, it is easier when launching a company, most likely due to their larger friendship and inter-organizational networks which may provide support during its establishment. Moreover, emotionally stable people may like to consider starting their companies, i.e., those people who do not become angry easily, are rarely irritable and envious, such that there will perhaps be less conflict and stressful situations at the beginning of the entrepreneurial journey. Other sub-dimensions of neuroticism like anger, depression, and personal anxiety can also cause additional problems, grievances, non-cooperation, disagreement, and disloyalty among colleagues while setting up a company (Auer Antončič, 2012).

A less lenient individual might be more successful in starting a business because with agreeableness as a personality trait a person can quickly change their decisions and not stick to agreements. The goals of less agreeable people can be more in the foreground and individuals can realize their vision more easily (Auer Antončič, 2012).

Launching a new idea or a new unit should also be tried by individuals who come from a local environment favorable to entrepreneurship since this background appears to be somewhat important for the establishment of a company.

The research has implications for the economy and society. Proposals on the level of the whole economy: Economic policymakers should strive to promote the factors that contribute to the establishment of enterprises through various mechanisms. Above all, it is necessary to encourage and develop openness in people given that openness can be important for the setting up of a company. It would also make sense to develop extroversion since that can be important for establishing companies. In addition, non-adherence could be encouraged as it may be important while establishing companies. This last suggestion regarding non-agreeableness may seem unusual or contrary to social norms as it would encourage characteristics like non-sympathy, indifference, unfriendliness, uncooperativeness, coldness, rudeness, and strictness, and we should hence be very careful with it. We suggest that those designing the education system devote themselves to the design of educational programs and content that will promote personality development, especially openness (e.g., creativity and imagination and philosophical, intellectual, and deep thinking) and extraversion (e.g., eloquence, boldness, energy, unrestrained thinking, and shamelessness) and possibly emphasize the positive role of the sociological factor of the local business environment.

Limitations and future research possibilities

There are some limitations of this research, e.g., in terms of the number of factors, the sample, and the data collection. The research is limited to the personality characteristics of persons and the sociological entrepreneurial background as an important set of factors that can contribute to the establishment of companies. Other factors that might be important for the setting up of companies (e.g., innovativeness, Alshebami and Seraj, 2022; creativity, Peljko and Auer Antončič, 2022; narcissism and resilience, Leonelli et al., 2022; improvisation, Guo et al., 2022; emotional intelligence, Lopez-Nunez et al., 2022; epistemic curiosity and entrepreneurial alertness, Heinemann et al., 2022; financial rewards and social recognition, Ismail, 2022; theory of planned behavior components: personal attitude, subjective norms, and perceived behavioral control, Maheshwari, 2021) were not included in the research and can be added in future studies.

Due to the limitation of the sample, the respondents were selected only in Slovenia, although the results of the research could also be transferred to other countries through future comparative studies. In future cross-national and/or cross-cultural studies, additional sociological factors reflecting cross-cultural differences may reveal impacts in the model. The SME sample is representative since it was collected through random sampling, whereas the student sample is purposive. In future research, it would be reasonable to use representative samples of persons on the population level.

The data were obtained based on a questionnaire that mainly had closed-type questions for later accurate data processing. In the questionnaire, an individual's subjective attitudes regarding individual claims were checked. The individual answered questions or statements by choosing from already given answers or statements, which may be a disadvantage, on the one hand, because there are usually only a limited number of such statements. Such predetermined statements, on the other hand, can provide an advantage because they are less likely to elicit ambiguous or overly broad responses from respondents. The most suitable method of data collection for this quantitative research was a closed-ended questionnaire, which allowed us to know all possible answers with sufficient reliability and that there were not too many of them. Future qualitative research could illuminate and expand our knowledge of the factors discussed. For example, a future qualitative study can examine in depth the meaning of psychological and sociological aspects of the entrepreneurial decision.

Conclusion

This research contributed a new model containing personality characteristics and characteristics of the sociological background that encouraged business start-ups (intentions and behaviors), which includes personality variables (Big Five personality factors), family entrepreneurial, and local support background variables, as well as control variables. Future research should explore and supplement this model in greater detail.

Data availability statement

The datasets presented in this article will be made available by the authors upon request. Requests to access the datasets should be directed to bostjan.antoncic@ef.uni-lj.si; jasna.auer@fm-kp.si.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

BA and JA developed the research project, carried out the data collection and analysis, wrote the first draft, and revised the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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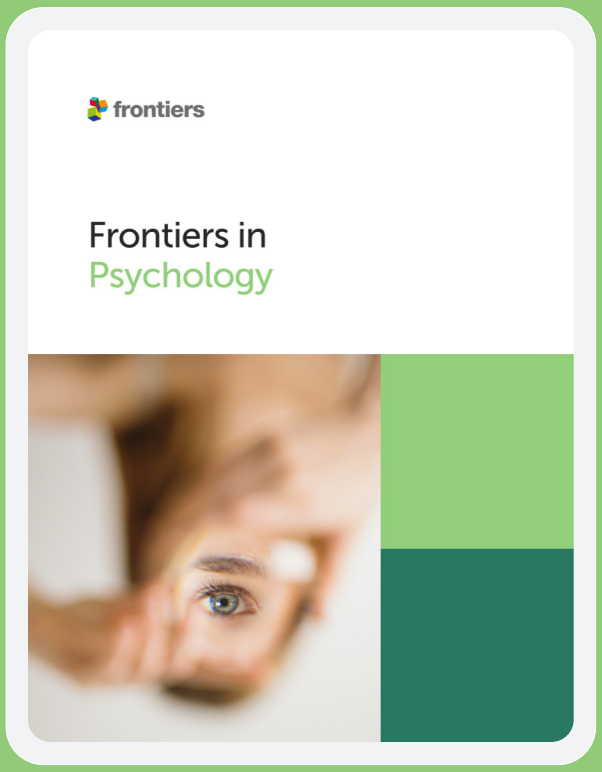

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