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The impact of Big Five Personality Traits on entrepreneurial orientation

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ABSTRACT

Our study explores the interplay between the Big Five Personality Traits (B5-PT) and Entrepreneurial Orientation (EO) among home and international entrepreneurs in the Middle East, focusing on Jordan, Saudi Arabia, and the United Arab Emirates. Utilizing fuzzy-set qualitative comparative analysis (fsQCA), we investigate how different combinations of personality traits influence EO in distinct entrepreneurial contexts. The findings reveal four universal configurations and four context-specific configurations that lead to high EO, highlighting the dynamic and configurational nature of entrepreneurial behaviour. For home entrepreneurs, high conscientiousness and agreeableness are key drivers of EO, reflecting a focus on collaboration and resource management within familiar environments. In contrast, international entrepreneurs benefit from openness and extraversion, which foster adaptability and networking capabilities in complex, cross-border markets. By adopting a configurational approach rooted in complexity theory, this study moves beyond reductionist frameworks, offering novel insights into the nonlinear and context-dependent relationships between personality traits and EO. These findings have practical implications for policymakers and entrepreneurs, providing a foundation for designing tailored interventions that enhance entrepreneurial success. The study also enriches the discourse on entrepreneurship in the Middle East by addressing underexplored regional dynamics and advancing the methodological application of fsQCA in entrepreneurship research.

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International entrepreneurship; entrepreneurial orientation; personality traits, fuzzy-set qualitative comparative analysis; domestic entrepreneurs; configuration

1. Introduction

Personality traits play a fundamental role in shaping entrepreneurial behaviour, influencing how individuals perceive opportunities, take risks, and engage in innovative activities (Franco and Prata 2019; Obschonka et al. 2020). The Big Five Personality Traits (B5-PT) – openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism – provide a widely accepted framework for understanding individual differences in entrepreneurship. While some research has examined the relationship between personality traits and entrepreneurship, most studies adopt a linear, additive perspective, treating traits as independent predictors of entrepreneurial outcomes (Haddoud et al. 2021). However, entrepreneurial behaviour is complex, and personality traits interact

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in nonlinear and context-dependent ways, necessitating a more nuanced approach to their role in shaping entrepreneurship.

Entrepreneurial orientation (EO) is a widely used construct that captures key entrepreneurial behaviours such as innovativeness, risk-taking, and proactiveness (J. Covin and Wales 2012). EO has traditionally been studied at the firm level, but recent research highlights its applicability at the individual level, where it reflects an entrepreneur's personal strategic mindset (i.e. Clark, Covin, and Pidduck 2024; Kraus et al. 2019). Individual EO is an emerging concept that would help understand how personality traits shape entrepreneurial tendencies, decision-making, and strategies (Clark, Pidduck et al. 2024; Wales, Monsen, and McKelvie 2011). Prior studies on EO often overlook the configurational interplay of personality traits, failing to capture the complex ways in which multiple traits combine to drive entrepreneurial action. This gap is particularly pronounced in studies that compare different entrepreneurial contexts.

Home and international entrepreneurs operate in distinct environments that demand different psychological and behavioural attributes. Home entrepreneurs benefit from familiarity with institutional frameworks, cultural norms, and market conditions (Liu, Botella Carrubi, and Blanco González-Tejero 2024), while international entrepreneurs must navigate regulatory uncertainty, cultural diversity, and heightened competition. As a result, the personality traits that contribute to high individual EO may differ significantly between these two groups. Despite the growing importance of globalized entrepreneurial ecosystems, little research has explored how personality traits shape EO differently in home versus international entrepreneurs.

We address these gaps by investigating the configurational impact of personality traits on individual EO among home and international entrepreneurs in the Middle East, focusing on Jordan, Saudi Arabia, and the United Arab Emirates (UAE). These countries offer diverse entrepreneurial landscapes – Jordan's necessity-driven entrepreneurship, Saudi Arabia's economic transformation under Vision 2030, and the UAE's role as a global business hub (Nasra and Dacin 2010). Despite the region's growing entrepreneurial ecosystem, few studies have examined how personality traits influence individual EO in this context, making this research particularly relevant for understanding entrepreneurial behaviour in emerging economies.

This study makes three significant contributions. First, we advance theoretical understanding by highlighting the interactions among personality traits influencing EO, adopting a configurational approach rooted in complexity theory, which emphasizes nonlinear, emergent interactions among traits, allowing for a more comprehensive examination of how different trait combinations influence EO (Fiss 2011; Zimmerman and Brouthers 2012). The entrepreneurship literature traditionally examines determinants in isolation or as linear relationships, but our configurational perspective reveals the nuanced and interactive dynamics that underpin entrepreneurial behaviour. Recognizing these interactions is critical, as overlooking them can lead researchers to oversimplify entrepreneurial behaviour, resulting in incomplete theories that fail to reflect the complex realities entrepreneurs face (Clark, Covin, and Pidduck 2024). Such oversimplifications can also misinform policymakers, who rely on theoretical insights to design effective entrepreneurial support initiatives. Second, by employing fuzzy-set qualitative comparative analysis (fsQCA), our study methodologically captures these trait interactions, explicitly revealing multiple pathways (equifinality) to high EO. FsQCA addresses limitations inherent in traditional variance-based methods by capturing how trait combinations, rather than single traits, can achieve similar entrepreneurial outcomes, thus offering greater explanatory power and theoretical accuracy in entrepreneurship research (Kraus, Ribeiro-Soriano, and Schüssler 2018). Finally, we empirically distinguish between home and international entrepreneurs, providing critical insights into how personality configurations shape EO differently across these groups. This comparative analysis significantly enhances our understanding by illustrating how exposure to different institutional and cultural contexts affects entrepreneurial disposition and behaviour (Martins and Perez 2025). While international entrepreneurs typically navigate heightened uncertainty, diverse cultural norms, and complex market dynamics, local entrepreneurs operate within

familiar environments where relationship-building and resource optimization are paramount. By explicitly contrasting these two groups, we address calls for more context-sensitive theorization of entrepreneurial orientation, thereby advancing our understanding of how global versus local experiences shape entrepreneurial outcomes (Clark, Covin, and Pidduck 2024; Martins and Perez 2025). These insights have clear practical implications, guiding policymakers in developing targeted entrepreneurial support strategies that align with distinct entrepreneurial profiles.

2. Theoretical discussion and literature Review

2.1. *B5-PT and EO*

Personality traits, whether inherited or acquired, play a crucial role in shaping entrepreneurial behaviours and outcomes. The Big Five Model remains the most widely utilized framework for assessing personality traits and has been extensively validated in psychology and entrepreneurship research (Obschonka et al. 2020; Sharma and Sharma 2021). These five traits: extraversion, openness to experience, conscientiousness, agreeableness, and neuroticism, offer a comprehensive lens for understanding individual differences that influence entrepreneurial behaviour (Franco and Prata 2019). Research has linked these traits to various entrepreneurial contexts, including work-life balance, well-being, and entrepreneurial self-efficacy (Allison et al. 2024; Engle-Warnick, Laszlo, and Sayour 2020; Haj Youssef and Sayour 2025; Şahin, Karadağ, and Tuncer 2019; Soni and Bakhru 2023; L. Zhao and Jung 2018).

Entrepreneurial Orientation (EO) is a multidimensional construct encompassing innovation, risk-taking, and proactiveness (Corrêa et al. 2022). EO reflects an entrepreneur's strategic mindset and serves as a crucial mediator between personality traits and entrepreneurial behaviour, shaping decision-making and performance through opportunity recognition, risk evaluation, and strategic proactiveness (Corrêa et al. 2022; Ibrahim and Mas'ud 2016). While prior research acknowledges the role of personality in EO, studies often examine these traits in isolation, overlooking their configurational interplay with contextual dynamics that shape entrepreneurial behaviour (Haddoud et al. 2021).

EO has traditionally been examined at the organizational level, where it represents a firm's strategic posture towards innovation, risk-taking, and proactiveness (J. G. Covin and Slevin 1989). However, its application at the individual level is an emerging research area that has gained increasing attention in recent years (Gupta et al. 2016; Kraus et al. 2019). Unlike an entrepreneurial mindset (Davis, Hall, and Mayer 2016), which primarily concerns cognitive processes, or entrepreneurial action (Alvarez and Barney 2005), which focuses on actual behaviours, EO uniquely integrates both beliefs and behaviours. Unlike models such as the Theory of Planned Behavior (Ajzen 1991) or the Theory of Reasoned Action (Ajzen and Fishbein 1975), which link attitudes to actions based on situational influences, EO beliefs are dispositional and thus more stable over time (David and Strang 2006). In this context, EO reflects an individual's propensity to innovate, take risks, and act proactively (Bernoster, Mukerjee, and Thurik 2020). Several studies have validated the predictive role of EO in entrepreneurial intentions and behaviours, demonstrating its relevance at the individual level (i.e. Anwar, Thoudam, and Saleem 2022; Clark, Covin, and Pidduck 2024).

Additional theoretical perspectives further support the individual-level conceptualization of EO. The person-environment fit approach suggests that individuals perform better when their personal characteristics align with environmental demands and opportunities (i.e. Audretsch, Lehmann, and Schenkenhofer 2021). EO, as a personal characteristic, aligns well with the dynamic and uncertain nature of entrepreneurship, ensuring a strong fit between entrepreneurial individuals and the environments they navigate (Poudel, Carter, and Lonial 2019). Likewise, social cognitive theory highlights the role of cognitive abilities, personality traits, and self-efficacy in shaping entrepreneurial behaviour, emphasizing the interactive influence of personal and environmental factors (Pindado and Sánchez 2017). By integrating these perspectives, EO emerges as a dynamic construct that captures the psychological and behavioural traits necessary for entrepreneurial success (Frese and Gielnik 2014).

Recent research has strengthened the conceptual and empirical foundation of EO. Clark, Covin, and Pidduck (2024) argue that EO's dimensions are not exclusive to organizations but also manifest as individual-level behaviours and attitudes. Their work demonstrates that EO reflects entrepreneurial tendencies central to personal decision-making, particularly in contexts such as solo entrepreneurship and small ventures. This validation of EO as a distinct construct responds to calls for a greater alignment between entrepreneurial strategy and individual psychology. Empirical studies further support the role of EO in shaping entrepreneurial behaviour. Koe (2016) highlights its critical influence on entrepreneurial intention, linking it to key cognitive processes such as attitudes, perceived behavioural control, and subjective norms, as outlined in the theory of planned behaviour. Similarly, Palmer et al. (2019) examine the interplay between EO and psychological traits, demonstrating that EO serves as a mediating mechanism through which personality traits like openness to experience and conscientiousness shape entrepreneurial outcomes. Their findings reinforce the configurational nature of EO, where its interaction with personal and contextual factors enhances its predictive validity in entrepreneurial research. Moreover, empirical evidence confirms that EO is positively associated with entrepreneurial intentions, opportunity recognition, and business performance (R. Harms, Hatak, and Chang 2019; Hughes et al. 2022). EO is also influenced by various personal and contextual factors, including personality traits, education, and cultural orientation, highlighting its multidimensional nature (Stamm and Gutzeit 2022). Research has demonstrated that passion, proactiveness, and risk-taking propensity drive entrepreneurial success by aligning individual characteristics with entrepreneurial opportunities (Clark, Covin, and Pidduck 2024; Koe 2016).

Building on these recent theoretical advancements, this study adopts an individual-level conceptualization of EO to examine its intersection with personality traits, utilizing the approach of Howard (2023, 2024). This research contributes to bridging traditional EO studies with advancements in personality-based entrepreneurship research, offering a nuanced understanding of how EO is shaped by personality configurations (Palmer et al. 2019). In particular, we extend EO's applicability to the personal domain, providing new insights into how individual traits influence entrepreneurial tendencies across different contexts, including home and international entrepreneurs in the Middle East.

The multidimensional and interactive nature of EO suggests that its development is not driven by isolated traits but rather by specific trait configurations that interact dynamically with environmental factors. Prior research has provided valuable insights into the individual effects of personality traits on EO, but there remains a gap in understanding how these traits combine to shape entrepreneurial behaviour in different contexts. Given the nonlinear and emergent properties of EO, a configurational perspective is essential to capture the interdependencies between personality traits and their collective influence on entrepreneurial tendencies. The configurational nature of EO underscores the need to examine how specific trait combinations influence entrepreneurial outcomes. For example, openness is associated with innovation and risk-taking, while conscientiousness enhances planning and execution, suggesting that certain trait interactions are particularly conducive to EO (Leutner et al. 2014). Research has further explored how personality traits shape entrepreneurial behaviour through mediating mechanisms, such as entrepreneurial competencies and psychological resilience (Wu et al. 2022). Additionally, narrow traits like proactiveness, risk-taking, and innovativeness have been identified as particularly influential, reinforcing the configurational and context-dependent nature of EO (Krieger et al. 2021).

This study extends prior research by adopting an individual-level conceptualization of EO and employing fuzzy-set qualitative comparative analysis (fsQCA) to uncover the configurational dynamics of personality traits that foster high EO. By comparing home and international entrepreneurs, this research responds to calls for a more nuanced understanding of the interdependencies between personality traits, EO, and contextual factors, particularly in underexplored regions such as the Middle East. The following section elaborates on each of the Big Five Personality Traits (B5-PT) and their relationship with EO.

2.1.1. Agreeableness and EO

Agreeableness, characterized by cooperativeness, tolerance, and trustworthiness, plays a crucial role in entrepreneurial contexts where collaboration and knowledge-sharing drive innovation and business growth (L. Zhao and Jung 2018). This trait fosters network-building, facilitates access to financial resources, and enhances investment opportunities (Bernardino and Santos 2016). However, the relationship between agreeableness and entrepreneurial behaviour is complex. While agreeableness fosters teamwork, it may also reduce the level of competitive aggression needed in highly competitive business environments where assertiveness and risk-taking are essential (H. Zhao and Seibert 2006). Research suggests that agreeableness negatively correlates with dark triad traits like Machiavellianism and psychopathy, which are often linked to competitive and manipulative behaviours advantageous in certain entrepreneurial contexts (Kraus, Ribeiro-Soriano, and Schüssler 2018). Despite these trade-offs, agreeableness significantly influences entrepreneurial decision-making. Its strengths are particularly evident in ventures requiring teamwork, negotiation, and stakeholder engagement (Murugesan and Jayavelu 2017). However, in highly dynamic markets, overly agreeable entrepreneurs may struggle with proactivity and decisive risk-taking. Ultimately, the influence of agreeableness on EO is highly context dependent. While it fosters collaboration and trust, it may hinder assertiveness and competitive positioning in more aggressive business landscapes. Entrepreneurs must strategically balance agreeableness with assertiveness to optimize their EO across different market conditions.

2.1.2. Extraversion and EO

Extraversion, characterized by social skills, assertiveness, and sociability, enables individuals to be energetic, talkative, and approachable (Franco and Prata 2019; L. Zhao and Jung 2018). This personality trait is linked to resilience and positively influences well-being, providing psychological advantages in entrepreneurial settings (Soni and Bakhru 2023). Extraversion enhances stakeholder relationships, facilitates venture creation, and boosts opportunity recognition (Laouiti et al. 2022). Extraversion is strongly associated with EO, as extraverted individuals demonstrate higher tendencies for risk-taking, networking, and opportunity-seizing (Obschonka et al. 2013). This association is evident in opportunity recognition and exploitation H. Zhao and Seibert (2006). For instance, Kraus, Ribeiro-Soriano, and Schüssler (2018) found that extraverted individuals are more likely to engage in proactive behaviours, such as seeking opportunities and taking initiative. Similarly, Yurrebaso, Picado, and Paiva (2021) reported that entrepreneurs with high entrepreneurial intention scored higher in extraversion compared to those with lower entrepreneurial intention. The outgoing and energetic nature of extraverts supports their ability to navigate uncertainty, fostering a proactive and innovative approach to entrepreneurship. Extraverts excel at networking, relationship-building, and promoting ideas, which are critical for securing resources and support for entrepreneurial ventures (H. Zhao and Seibert 2006). However, extraversion also presents drawbacks. The need for social interaction and external validation may lead to impulsive decision-making and a lack of focus, potentially hindering entrepreneurial success (Rauch and Frese 2007). Additionally, overconfidence and optimism, common among extraverts, can lead to underestimating risks and overestimating capabilities, resulting in poor strategic choices (Hayward and Hambrick 1997). Entrepreneurs must balance the benefits of extraversion with structured planning and careful management to mitigate these risks.

2.1.3. Conscientiousness and EO

Conscientiousness, characterized by traits such as responsibility, organization, diligence, and competence, plays a critical role in entrepreneurship. Highly conscientious individuals are reliable, structured, and goal-oriented, making them well-suited for roles requiring accountability and long-term planning (Franco and Prata 2019). In entrepreneurial settings, conscientiousness is strongly linked to motivation, persistence, and meticulous execution (Allison et al. 2024; Bernardino and Santos 2016). While conscientiousness is generally considered a driver of entrepreneurial

performance, its relationship with EO is complex. Some studies establish a positive association between conscientiousness and entrepreneurship (Ciavarella et al. 2004), while others suggest a neutral or even negative effect (H. Zhao and Seibert 2006). This variation arises because conscientiousness can both enable and limit entrepreneurial behaviour. On one hand, its emphasis on organization and persistence fosters structured execution and calculated risk-taking, essential for venture success. On the other hand, conscientious individuals may exhibit an aversion to uncertainty and a rigid adherence to established norms, limiting innovation and proactiveness. In international entrepreneurship, conscientiousness plays a vital role in managing cross-border complexities. The meticulous planning and risk-mitigation strategies of conscientious individuals enhance stability in uncertain markets (Kraus et al. 2019). However, adaptability and flexibility are equally important for navigating dynamic international environments landscapes (Chen, Lin, and Tsai 2020). The impact of conscientiousness on EO is further shaped by contextual and environmental factors. In stable, structured settings, conscientious individuals may leverage their organizational skills to drive entrepreneurial success. However, in high-risk or volatile environments, excessive adherence to routines may stifle innovation and strategic agility (Stewart and Roth 2007). Additionally, conscientiousness may amplify the effects of other traits, such as extraversion (enhancing networking capabilities) or agreeableness (facilitating collaboration), demonstrating its configurational role in entrepreneurial behaviour. Overall, conscientiousness serves as both an asset and a constraint in EO. While it enhances perseverance, organization, and strategic risk management, its rigid tendencies can limit adaptability and proactiveness.

2.1.4. Neuroticism and EO

Neuroticism, characterized by emotional instability, self-consciousness, and impulsiveness, affects an individual's ability to cope with uncertainty and stress, which are key factors in entrepreneurship (Allison et al. 2024). Highly neurotic individuals often experience heightened anxiety and self-doubt, leading to increased emotional reactivity and a greater tendency towards stress-induced burnout (Laouiti et al. 2022; Parra, Gupta, and Cadden 2022). Conversely, individuals with low neuroticism demonstrate greater emotional stability and resilience, traits that enhance their capacity to navigate entrepreneurial challenges effectively (Soni and Bakhru 2023). Research consistently shows a negative association between neuroticism and EO. Entrepreneurs with high neuroticism tend to exhibit lower risk tolerance, reduced persistence, and impaired decision-making, all of which hinder opportunity recognition and strategic risk-taking (Leutner et al. 2014; Watson et al. 2020). However, neuroticism's influence on EO is not entirely detrimental. In certain contexts, heightened sensitivity to risk and caution may lead to more deliberate and calculated decision-making, particularly in industries where meticulous risk assessment is crucial. Additionally, the anxiety and self-doubt characteristic of neuroticism can serve as motivation for individuals to strive for excellence and maintain high levels of effort (H. Zhao, Seibert, and Lumpkin 2010). In sum, while neuroticism poses challenges for entrepreneurship by increasing risk aversion and emotional instability, its impact depends on contextual factors and complementary traits.

2.1.5. Openness to experience and EO

Openness to experience, characterized by curiosity, imagination, and creativity, is a key driver of entrepreneurial behaviour. This trait fosters receptiveness to novelty, enabling entrepreneurs to explore new ideas, challenge conventional thinking, and leverage external networks for competitive advantage (L. Zhao and Jung 2018). Openness to experience is consistently linked to EO, as individuals high in this trait tend to be more innovative, proactive, and willing to take risks (Şahin, Karadağ, and Tuncer 2019). Empirical research underscores the positive impact of openness on firm performance, particularly in SMEs, where it enhances networking capabilities and strategic adaptability (Franco and Prata 2019). Additionally, openness has been shown to increase self-efficacy and social entrepreneurial intention, particularly when combined with conscientiousness (Uzzal, et al., Wasim et al. 2024). This suggests that openness may be most effective when balanced with traits that

provide structure and discipline. The core dimensions of EO (innovativeness, proactiveness, and risk-taking) align naturally with openness to experience (J. G. Covin and Slevin 1989; Miller 2011). Open individuals are more likely to identify, assess, and exploit entrepreneurial opportunities, given their adaptability and preference for novelty (Rauch and Frese 2007). For instance, Watson et al. (2020) found that franchisees high in openness exhibited greater innovative behaviour, even within highly structured franchise systems. Similarly, Yurrebaso, Picado, and Paiva (2021) reported that openness was strongly associated with sustaining entrepreneurial intention, as individuals high in openness tend to adapt more effectively to dynamic environments and persist in the face of challenges. However, while openness generally fosters EO, its effects are not always linear or universally positive. In highly regulated environments that emphasize risk aversion, the advantages of openness may be muted (Lumpkin and Dess 2001). Excessive openness can lead to a lack of focus, as highly open entrepreneurs may pursue too many ideas simultaneously, potentially diluting their efforts and reducing overall effectiveness (Rauch and Frese 2007). These findings underscore the importance of contextual factors and the interplay of traits in shaping entrepreneurial success. Thus, openness to experience is a critical enabler of EO, promoting innovation, adaptability, and risk-taking. However, its impact is contingent on contextual conditions and complementary personality traits such as conscientiousness.

2.2. The interaction between personality traits and EO

Complexity theory provides a nuanced framework for understanding how entrepreneurial behaviour emerges from the dynamic interplay of multiple factors. This theory posits that systems consist of interconnected elements, where interactions generate emergent properties that cannot be predicted by analysing individual components in isolation (Autio, Pathak, and Wennberg 2013). Applied to entrepreneurship, this perspective suggests that the relationship between the B5-PT and EO is nonlinear and context-dependent, producing diverse entrepreneurial outcomes.

A configurational approach, rooted in complexity theory, offers a more comprehensive framework for exploring how multiple personality traits combine to shape EO. Unlike traditional linear models that treat traits as independent predictors, this approach accounts for the synergies and interdependencies among traits and their interaction with environmental factors (Estrada-Robles, Williams, and Vorley 2020). For example, openness to experience fosters innovation and risk-taking, while conscientiousness supports structured planning and execution (Barber 2015). However, their combined influence may be contingent on other traits, such as extraversion or low neuroticism, as well as external contextual conditions. For example, a combination of high openness and extraversion may enhance proactiveness and risk-taking, whereas high conscientiousness combined with low neuroticism may foster resilience and strategic decision-making (Bergner, Auburger, and Paleczek 2023). Such perspective complements recent scholarship that questions the binary classifications of entrepreneurs and highlights the heterogeneity of entrepreneurial behaviour and pathways (Hussein and Youssef 2023).

The configurational perspective also acknowledges that personality traits evolve over time, influenced by factors such as life experiences, education, and socioeconomic conditions (Luo, Huang, and Gao 2022). For instance, professional development or exposure to diverse environments can enhance traits like conscientiousness and openness, enabling entrepreneurs to adapt and innovate more effectively in dynamic markets. A configurational approach not only provides insights into how specific personality profiles drive EO but also highlights the importance of trait combinations rather than isolated characteristics. Konon and Kritikos (2019) argue that combinations of traits are more predictive of entrepreneurial behaviour than single-trait models, reinforcing the complexity and context-dependency of EO. For example, a configuration of high conscientiousness, agreeableness, and openness may drive proactiveness and innovation, while a combination of low neuroticism and high extraversion could foster adaptability and opportunity recognition. By embracing

complexity theory and the configurational approach, this study moves beyond reductionist models to capture the emergent, nonlinear, and context-specific nature of EO. Based on this discussion, we propose:

P1. Discrete combinations of at least three personality traits, such as high conscientiousness, high agreeableness, and high openness to experience, are associated with high EO among entrepreneurs in the Middle East.

2.3. Differences between home and international entrepreneurs

Traits such as openness and extraversion, which foster adaptability and networking, may synergistically enhance individual EO among international entrepreneurs navigating diverse and dynamic environments. Conversely, conscientiousness and agreeableness may exert a stronger influence on home entrepreneurs, who often benefit from stability, collaboration, and resource optimization within familiar contexts (Gupta et al. 2016).

Domestic entrepreneurs operate in relatively stable environments characterized by familiarity with cultural norms, regulatory frameworks, and institutional structures. These stable conditions allow personality traits like conscientiousness and agreeableness to exert a more direct influence on entrepreneurial behaviour. Conscientiousness facilitates structured planning and resource management, while agreeableness fosters trust and collaboration in stakeholder relationships. Complexity theory highlights that in such predictable systems, the interplay of a few dominant traits can lead to emergent behaviours like enhanced collaboration and strategic resource allocation (Nasra and Dacin 2010).

In contrast, international entrepreneurs face diverse cultural norms, regulatory challenges, and competitive pressures. These dynamic environments amplify the importance of traits such as openness and extraversion, which enhance adaptability, networking, and opportunity recognition. Openness to experience facilitates cultural intelligence and cross-border innovation, while extraversion supports relationship-building and the ability to secure resources in global markets (He et al. 2020). Complexity theory suggests that in high-uncertainty systems, nonlinear interactions between traits and external factors lead to emergent behaviours, such as the ability to pivot strategies and exploit global opportunities. For instance, international entrepreneurs with high openness and cultural intelligence may navigate cross-cultural differences more effectively, leading to innovative outcomes and expanded market presence (Zimmerman and Brouthers 2012).

Complexity theory's principles of nonlinearity and equifinality elucidate the differences in how personality traits shape individual EO for home and international entrepreneurs. Nonlinearity implies that small variations in one trait, such as extraversion, can disproportionately affect EO when combined with other traits like low neuroticism. For example, highly extraverted international entrepreneurs may leverage their social networks to generate cascading benefits in opportunity recognition and cross-border collaborations (Damian, Serrano, and Hill 2021). This dynamic is reinforced by evidence that social networks significantly enhance entrepreneurial learning and capacity development (Wasim et al. 2024). Equifinality posits that multiple pathways can lead to the same outcome, such as high EO. This principle explains why home entrepreneurs may achieve high individual EO through conscientiousness and agreeableness, while international entrepreneurs achieve similar outcomes through openness and extraversion (Ribau, Moreira, and Raposo 2017; Zimmerman and Brouthers 2012). Dynamic capabilities, such as the ability to reconfigure resources and adapt to changing environments, further illustrate the interaction between personality traits and EO. For international entrepreneurs, high openness and extraversion enhance dynamic capabilities, enabling them to pivot strategies and seize opportunities in volatile global markets (Eshima and Anderson 2017). Home entrepreneurs, by contrast, may leverage conscientiousness and agreeableness to build stable networks and optimize resources in local ecosystems. These interactions reflect the nonlinear and emergent nature of entrepreneurial behaviour. For instance, low neuroticism combined with high openness may foster resilience and innovation for international entrepreneurs,

while high conscientiousness paired with agreeableness may support collaboration and strategic planning for domestic entrepreneurs.

While the EO of international entrepreneurs emphasizes proactiveness, innovativeness, and competitive aggressiveness (J. Covin and Wales 2012), domestic entrepreneurs may prioritize structured growth, stakeholder collaboration, and resource efficiency. These differences stem from the distinct contextual conditions that shape entrepreneurial behaviour. For example, international entrepreneurs often navigate liabilities of foreignness and outsider-ship, which require greater self-efficacy and proactive behaviours to overcome barriers in foreign markets (Johanson and Vahlne 1977). Conversely, domestic entrepreneurs benefit from the stability of operating within familiar environments, where relationships and institutional trust can be more easily leveraged. Based on this discussion, we propose the following:

P2: For home entrepreneurs, combinations associated with high EO are more likely to involve high conscientiousness and high agreeableness, reflecting a focus on collaboration and resource management within local contexts.

P3: For international entrepreneurs, combinations associated with high EO are more likely to involve high openness to experience and high extraversion, reflecting adaptability and networking capabilities needed for navigating diverse and dynamic markets.

3. Methods and data

This study examines the relationship between personality traits and entrepreneurial orientation (EO) by comparing two distinct groups of entrepreneurs: home and international. The sample comprises entrepreneurs from three Middle Eastern countries: Jordan, the Kingdom of Saudi Arabia (KSA), and the United Arab Emirates (UAE). We selected these countries for their diverse entrepreneurial ecosystems and for the balance between home and international entrepreneurship. The UAE serves as a regional innovation hub, attracting a substantial expatriate entrepreneurial population, supported by policies like the UAE National Innovation Strategy. KSA, undergoing economic transformation under Vision 2030, presents a dynamic entrepreneurial landscape shaped by local traditions and increasing global integration (Financial Times 2023). Jordan, characterized by resource-constrained entrepreneurship, primarily features necessity-driven ventures but remains engaged in international partnerships through initiatives such as Oasis500. The selection of these countries provides a robust context for exploring the interplay between personality traits and EO across different economic, cultural, and policy environments. The study's total sample consists of 1,516 entrepreneurs, of whom 458 are international entrepreneurs, defined as those whose nationality differs from their country of residence and business operations. The remaining 1,058 are home entrepreneurs who operate in their country of nationality. The sample encompasses established entrepreneurs with several years of business experience. Table 1 presents descriptive statistics, highlighting the demographic and business-related characteristics of both groups. Approximately 68% of the sample are males, with an average age between 32 and 34 years. Among home entrepreneurs, 55.6% hold a high school degree, and 41% have post-secondary education, compared to 70.6% and 27.6%, respectively, among international entrepreneurs. Between 83% and 85% of respondents are married, with 74% to 79% having children. Regarding health status, 87.4% of home entrepreneurs report being in good health, compared to 95.6% of international entrepreneurs. Additionally, 57.9% of home entrepreneurs report having a self-employed father and 3.2% a self-employed mother, while the figures for international entrepreneurs are 50.4% and 4.6%, respectively. The sample is primarily concentrated in the trade, services, and construction industries.

Data collection was conducted based on a purposive sampling technique to obtain a substantial number of entrepreneurs (Welter, Xheneti, and Smallbone 2018). Given the study's emphasis on established entrepreneurs, this sampling approach allowed for the inclusion of business owners who are actively engaged in entrepreneurial activities. Data

Table 1. Descriptive statistics.

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Home entrepreneurs			International Entrepreneurs		
	Obs	Mean	Std. dev	Obs	Mean	Std. dev
Male	1,058	0.671	0.470	458	0.683	0.466
Age	1,058	32.475	8.732	458	34.338	9.138
High School	970	0.556	0.497	449	0.706	0.456
Above High School	970	0.410	0.492	449	0.276	0.448
Married	1,055	0.827	0.379	458	0.845	0.362
Has Children	1,058	0.742	0.438	458	0.788	0.409
Good Health	1,057	0.874	0.332	457	0.956	0.205
Disability	1,058	0.010	0.101	458	0.017	0.131
Father Self-Employed	1,058	0.579	0.494	458	0.504	0.501
Mother Self-Employed	1,058	0.032	0.176	458	0.046	0.209
Agriculture	1,058	0.014	0.118	458	0.007	0.081
Industry	1,058	0.069	0.254	458	0.052	0.223
Finance	1,058	0.001	0.031	458	0.011	0.104
IT	1,058	0.001	0.031	458	0.007	0.081
Construction	1,058	0.095	0.293	458	0.164	0.370
Health	1,058	0.030	0.171	458	0.061	0.240
Education	1,058	0.031	0.174	458	0.015	0.123
Trade	1,058	0.456	0.498	458	0.426	0.495
Service	1,058	0.241	0.428	458	0.221	0.415
Administration	1,058	0.062	0.242	458	0.037	0.189

Notes: The table reports the descriptive statistics for the sample used. Columns (1) to (3) report the number of observations, mean and standard deviation for the home entrepreneurs subsample. Columns (4) to (6) report similar statistics for the international entrepreneurs subsample.

was gathered through Computer-Assisted Personal Interviewing (CAPI), enhancing accuracy and consistency. EO was measured using a seven-point Likert scale based on Howard (2023, 2024). The EO scale comprises five dimensions: innovativeness, risk-taking propensity, achievement orientation, proactiveness, and autonomy orientation, each assessed with four items. Sample items include: ‘I am able to come up with new and different ideas’ and ‘I am good at finding creative ways to solve problems’ for innovativeness, and ‘I take the initiative whenever I have the opportunity to do so’ for proactiveness. Personality traits were measured using the Big Five International Personality Item Pool, a widely accepted scale for assessing extraversion, openness to experience, conscientiousness, agreeableness, and neuroticism Goldberg et al. (2006). Details of scales can be found in [Appendix A](#).

To ensure cultural and linguistic accuracy, the survey instruments were professionally translated into Arabic, maintaining contextual relevance. The questionnaire was programmed into a Computer-Assisted Personal Interviewing (CAPI) platform, enabling real-time monitoring, validation, and efficient data collection via smart tablets. A team of 18 trained enumerators (six per country) familiar with local contexts conducted the interviews. Their training included survey content, CAPI usage, rapport-building, and ethical considerations. The six-month fieldwork (October 2023–March 2024) was closely supervised to ensure protocol adherence, data consistency, and immediate resolution of discrepancies. The combination of electronic data capture and structured personal engagement enhanced data quality and addressed challenges commonly associated with traditional survey techniques in the MENA region (Sun, Conrad, and Kreuter 2021).

This study addresses common method bias by following the guidelines of Bagozzi, Yi, and Phillips (1991) and Podsakoff et al. (2003). To ensure that the collected data is free from common method variance, Harman’s one-factor test (Podsakoff et al. 2003) was applied to all three data collections of Jordan sample ($N=502$), KSA sample ($N=759$), and UAE sample ($N=255$). The findings of the principal component analysis of a single factor showed values below the threshold of 50% total variance explained for Jordan sample (14.8%), KSA sample (27.5%), and UAE sample (22.5%).

Table 2. Reliability and validity of the constructs.

Constructs	ABN	CTS	EO	EVS	NTM	ONE	CA	CR	AVE
ABN	0.764						0.763	0.849	0.584
CTS	0.594	0.692					0.727	0.821	0.500
EI	0.452	0.570	0.769				0.881	0.908	0.591
EVS	0.443	0.366	0.295	0.675			0.701	0.807	0.500
NTM	0.006	−0.114	−0.045	−0.012	0.775		0.843	0.882	0.601
ONE	0.558	0.664	0.611	0.374	−0.066	0.757	0.751	0.842	0.573

Notes: ABN: Agreeableness; CTS: Conscientiousness; EO: Entrepreneurial Orientation; EVS: Extroversion; NTM: Neuroticism; ONE: Openness to Experience; CA: Cronbach's Alpha; CR: Composite Reliability; AVE: Average Variance Extracted.

Furthermore, based on Bagozzi's general rule of thumb for addressing common method variance (Bagozzi, Yi, and Phillips 1991), the highest correlation between variables is 0.664 (the correlation between openness and conscientiousness in Table 2), which is below the threshold of 0.9.

4. Data Analysis

4.1. FsQCA

Recently, the fuzzy-set qualitative comparative analysis (fsQCA) has received increased attention due to its capability to provide richer insights from collected data (Woodside 2014). Previous studies have increasingly employed fsQCA in consumer psychology research (Schmitt, Grawe, and Woodside 2017) due to its versatility in deductive approaches and theory testing (Park, Fiss, and El Sawy 2020). Using fsQCA, scholars can identify possible solutions/recipes for the outcome variable or test specific propositions based on previous research (Pappas et al. 2020). One of the ways to overcome the limitation of symmetric analysis (regression-based analysis) is to examine the complex relationships between interrelated conditions (Pappas and Woodside 2021). Complexity and configuration theories follow the rule of causal asymmetry, where combinations of conditions can explain the presence or absence of an outcome (Fiss 2011). This highlights the complex nature of studies in social science, and researchers are advised to use appropriate methods to 'provide complex configurations instead of one simple condition provided by symmetric and conventional techniques' (Rasoolimanesh, Valaei, and Rezaei 2023, 149). FsQCA is a way of moving beyond variance-based techniques, which compute the net effects (Pappas and Woodside 2021), whereas fsQCA emphasizes the complex relationships between the outcome condition and its antecedents. FsQCA combines fuzzy-set and fuzzy-logic principles with QCA methodologies, providing a more realistic approach than percentile methods (Ragin 2009).

4.2. Calibration

The configurational analysis in this research uses the truth table algorithm via fsQCA 4.1 software for MacOS. FsQCA uses calibration measures, and data is transformed into scores varying between 0 and 1 (Pappas and Woodside 2021). We calculate the mean values of all the measurement items of the constructs to derive a single value per case (Pappas and Woodside 2021). Furthermore, this study uses theoretically meaningful cut-off points (5 = full membership; 3 = cross over point; and 1 = non-membership) for 5-point Likert scales of Big Five Personality Traits (B5-PT). In addition, different cut-off points (7 = full membership; 4 = cross over point; and 1 = non-membership) are applied for 7-point Likert scales of EO variables. We believe that this is a more accurate representation of our samples. To improve the robustness of data calibration, we used alternative thresholds as standard practice by anchoring calibration thresholds to the theoretical meaning of scale points using the guidelines of Schneider and Wagemann (2012), Greckhamer et al. (2018), and Pappas and Woodside (2021). Additional analyses were conducted using different cut-off points (Pappas and Woodside 2021) of 4 = full membership, 3 = cross over point, and 2 = non membership for variables of

Table 3. Necessity Analysis for high EO.

Constructs	Consistency	Coverage
EVS	0.840	0.970
~EVS	0.336	0.967
ABN	0.916	0.951
~ABN	0.243	0.968
CTS	0.940	0.949
~CTS	0.215	0.962
NTM	0.516	0.973
~NTM	0.653	0.955
ONE	0.924	0.958
~ONE	0.240	0.960

Notes: ABN: Agreeableness; CTS: Conscientiousness; EO: Entrepreneurial Orientation; EVS: Extroversion; NTM: Neuroticism; ONE: Openness to Experience.

personality traits and different cut-off points of 6 = full membership, 4 = cross over point, and 2 = non membership for Entrepreneurial Orientation (EO) variables. To ensure that our findings are not impacted by the cut-off points applied in the calibration process, we conduct additional analysis using different cut-off points of 4 = full membership, 3 = cross over point, and 2 = non membership for variables of personality traits, and different cut-off points of 6 = full membership, 4 = cross over point, and 2 = non membership for EO variables. Our inferences remain unchanged to alternative cut-off points as shown in [Appendices B and C](#).

4.3. Reliability and validity

The measurement items are calibrated based on the guidelines of Ragin (2009). To increase the robustness of the results, we check the reliability and validity metrics of measurement items before applying fsQCA (Khan, Rezaei, and Valaei 2022). Specifically, we use structural equation modelling to check the indicator reliability, convergent validity, and discriminant validity. [Table 2](#) shows values of the Fornell-Larcker criterion, Cronbach's alpha, composite reliability, and the average variance extracted. The square root of each variable (bold values) is higher than its correlations with other variables, indicating the discriminant validity. In addition, all the alpha values are higher than 0.701. The composite reliability and average variance extracted values exceed the threshold, with the lowest values being 0.807 and 0.5, respectively.

4.4. Necessity analysis

[Table 3](#) reports the results of necessity analysis. This table indicates the necessary conditions required to produce a high level of EO. The necessary conditions must show a minimum consistency of 0.9 (Pappas and Woodside 2021; Valaei, Rezaei, and Ismail 2017) to be considered necessary for high EO. The results indicate that agreeableness (consistency = 0.916, and coverage = 0.951), conscientiousness (consistency = 0.940, and coverage = 0.949), and openness to experience (consistency = 0.924, and coverage = 0.958) are necessary conditions to produce a high degree of EO.

5. Findings

The results of fuzzy-set qualitative comparative analysis (fsQCA) provide three types of sufficient configurations (parsimonious, intermediate, and complex). In this study, complex solutions are provided for three different sets of configurations to achieve high entrepreneurial orientation (EO) ([Table 4](#)). For complex solutions, the frequency threshold is 10, and the consistency threshold is 0.8. The Black circles '●' indicate the presence of conditions, and the White circles '○' represent the absence of conditions. The blank cells also indicate the presence/absence of a condition. In the first

Table 4. Complex solutions for high EO.

Configuration	CTS	ABN	ONE	EVS	NTM	All data vs. different groups	Raw Coverage	Unit Coverage	Consistency
1	●	●	●			All data	0.856	0.121	0.979
2	●		●	●	○	All data	0.561	0.009	0.993
3	●	●		●	●	All data	0.459	0.006	0.994
4	○	○	○	○	○	All data	0.143	0.007	0.968
Solution coverage: 0.880; Solution consistency: 0.973									
5	●	●	●			Local	0.848	0.718	0.977
6	○	○	○	○	○	Local	0.139	0.009	0.954
Solution coverage: 0.857; Solution consistency: 0.971									
7	●	●	●		○	International	0.579	0.033	0.994
8	●	●	●	●		International	0.818	0.272	0.992
Solution coverage: 0.851; Solution consistency: 0.990									

Notes: ABN: Agreeableness; CTS: Conscientiousness; EO: Entrepreneurial Orientation; EVS: Extroversion; NTM: Neuroticism; ONE: Openness to Experience.

●: Presence of a condition.

○: Absence of a condition.

Blank cells: Ambiguous conditions.

Frequency threshold = 10.

Consistency threshold = ≥ 0.80 .

stage, all data ($N = 1516$) is explored, and four universal conditions are found. In the second stage, the distinction between local entrepreneurs ($N = 1058$) versus international entrepreneurs ($N = 458$) is examined, and four configurations are found.

Table 4 shows sufficient complex solutions for achieving high EO, where four universal configurations are identified with high solution coverage of 0.88 and high solution consistency of 0.973. The four generally accepted solutions are: configuration 1: high level of consciousness, agreeableness, and openness; configuration 2: high level of consciousness, openness, extroversion, and low level of neuroticism; configuration 3: high level of consciousness, agreeableness, extroversion, and neuroticism; and configuration 4: low level of consciousness, agreeableness, openness, extroversion, and neuroticism. According to Pappas et al. (2020), raw coverage indicates the extent to which an outcome is explained by a particular alternative solution, whereas unique coverage shows the extent to which an outcome is exclusively explained by that specific alternative solution.

To explore the differences between local and international entrepreneurs, four solutions were identified. Configuration 5 shows that high levels of consciousness, agreeableness, and openness to experience lead to a high level of EO for local entrepreneurs, and even low levels of these traits, together with low extroversion and neuroticism (configuration 6), could lead to a high level of EO. Solution 7 indicates that high levels of consciousness, agreeableness, and openness to experience, and low neuroticism lead to high EO amongst international entrepreneurs. In addition, solution 8 highlights that high levels of consciousness, agreeableness, openness to experience, and extroversion also lead to high EO in international entrepreneurs. It is worth noting that most of the configurations in Table 4 verify the importance of consciousness, agreeableness, and openness to experience to achieve high EO.

To further investigate the distinction between international and local entrepreneurs, we explore each sample of Jordan ($N = 502$, where local = 466 and international = 36), KSA ($N = 759$, where local = 553 and international = 206), and UAE ($N = 255$, where local = 39 and international = 216) separately. Table 5 shows sufficient complex solutions for achieving high EO, where eight configurations are identified for international vs. local entrepreneurs in these countries separately. In the sample of Jordan, three configurations are identified with high solution coverage of 0.816 and high solution consistency of 0.955 (configurations 9 and 10 for local entrepreneurs) and configuration 11 for international entrepreneurs (solution coverage = 0.469; solution consistency = 0.993). Interestingly, for domestic Jordanian entrepreneurs, configurations 9 and 10 are identical to configurations 5 and 6. In addition, configuration 11 for international Jordanian entrepreneurs highlights that high EO is

Table 5. Complex solutions for high EO amongst local vs. international entrepreneurs in Jordan, KSA, and UAE.

Configuration	CTS	ABN	ONE	EVS	NTM	Country-Group	Raw Coverage	Unit Coverage	Consistency
9	●	●	●			Jordan-local	0.805	0.689	0.971
10	○	○	○	○	○	Jordan-local	0.127	0.011	0.893
Solution coverage: 0.816; Solution consistency: 0.955									
11	●	●	●	●	●	Jordan-Int.	0.469	0.469	0.993
Solution coverage: 0.469; Solution consistency: 0.993									
12	●	●	●		○	KSA-Local	0.662	0.033	0.990
13	●	●	●	●		KSA-Local	0.835	0.206	0.989
Solution coverage: 0.867; Solution consistency: 0.986									
14	●	●	●	●		KSA-Int.	0.835	0.835	0.987
Solution coverage: 0.835; Solution consistency: 0.987									
15	●	●	●	●		UAE-Local	0.797	0.797	0.995
Solution coverage: 0.797; Solution consistency: 0.995									
16	●	●	●	●		UAE-Int.	0.826	0.826	0.996
Solution coverage: 0.826; Solution consistency: 0.996									

Notes: ABN: Agreeableness; CTS: Conscientiousness; EO: Entrepreneurial Orientation; EVS: Extroversion; NTM: Neuroticism; ONE: Openness to Experience; Int.: International.

●: Presence of a condition.
○: Absence of a condition.
Blank cells: Ambiguous conditions.
Frequency threshold = 10.
Consistency threshold = ≥ 0.80 .

contingent upon high levels of all personality traits. In the KSA sample, three configurations are determined with a high solution coverage of 0.867, a high solution consistency of 0.986 (configurations 12 and 13 for local entrepreneurs), and configuration 14 for international entrepreneurs (solution coverage = 0.835; solution consistency = 0.987). Notably, for local Saudi entrepreneurs, configurations 12 and 13 are identical to solutions 7 and 8. In configuration 14, international Saudi entrepreneurs show the same results as in solution 13. Finally, in the sample of UAE entrepreneurs, two identical configurations are found with high solution coverage and consistency (see Table 5). The findings of configuration 15 (local UAE entrepreneurs) and configuration 16 (international UAE entrepreneurs) are similar to previous solutions found for configurations 8, 13, and 14.

To check the explanatory overlap and deepen combinatorial logic (Di Paola et al. 2025), fsQCA enables comparing the constellation of elements across different solutions (Park, Fiss, and El Sawy 2020). This study evaluates combinatorial logic in terms of substitutive and complementary relationships amongst configurations. Based on the results of Table 4 and Table 5 and according to the solutions found in separate settings (configurations 1, 5, 7, 8, 9, and 11–16), this study detects that consciousness, agreeableness and openness to experience stand in a complementary relationship such that they are required to be jointly present in order to achieve high EO. Furthermore, based on the findings of configurations 2, 4, 6, and 10, extroversion and neuroticism are substitutes.

6. Discussion

6.1. Contributions to research on EO

This research makes several key contributions to the entrepreneurship literature. Foremost, our configurational approach deepens the theoretical understanding of entrepreneurial orientation (EO) by capturing the interactive, nonlinear nature of personality traits. Entrepreneurship research traditionally relies on examining personality traits as independent predictors, thereby failing to recognize their interactive dynamics and the complex, emergent nature of entrepreneurial outcomes (Clark, Covin, and Pidduck 2024; Martins and Perez 2025). By revealing how specific configurations of traits rather than isolated traits drive high EO, our findings underscore the necessity of adopting a more sophisticated, interactional framework for studying entrepreneurship. Such nuance is crucial

because it more accurately mirrors entrepreneurial realities, improving theoretical precision and the practical effectiveness of entrepreneurial support policies. Furthermore, by employing fuzzy-set qualitative comparative analysis (fsQCA), this study methodologically advances entrepreneurship research by explicitly identifying multiple configurations (equifinality) that yield similar entrepreneurial outcomes. This methodological contribution responds directly to recent calls in the literature advocating for more robust, configuration-focused methods that better capture the complexity inherent in entrepreneurial behaviours (Martins and Perez 2025; Pappas and Woodside 2021). Finally, our comparative analysis of international versus local entrepreneurs offers significant empirical contributions by highlighting how distinct entrepreneurial contexts shape trait configurations associated with EO. International entrepreneurs face complex, culturally diverse markets characterized by high uncertainty and institutional variability, necessitating higher adaptability, openness, and extraversion. In contrast, local entrepreneurs benefit from stable institutional contexts and cultural familiarity, where conscientiousness and agreeableness more strongly support entrepreneurial behaviour. Contrasting these groups directly enriches our understanding by demonstrating how variations in market contexts significantly alter the role of personality traits in entrepreneurial outcomes, thus addressing recent literature calls for context-sensitive entrepreneurial orientation theorization (Martins and Perez 2025). This enhanced understanding provides policymakers with clearer guidance on crafting culturally sensitive, context-specific interventions, ultimately fostering more successful entrepreneurial ecosystems.

Our findings identify four complex, universal configurations that lead to high levels of EO (Configurations 1–4 in Table 4). Configuration 1 reveals that a combination of high conscientiousness, agreeableness, and openness leads to high EO. Such finding challenges earlier studies, such as H. Zhao and Seibert (2006), who find a negative association between agreeableness and entrepreneurial behaviour and Rohrbach-Schmidt et al. (2023), who document that agreeableness is associated with lower productivity and assertiveness. Nonetheless, our results align with research highlighting the positive association between agreeableness and entrepreneurial probability (Yang and Ai 2019) and intention (Laouiti et al. 2022). Configuration 2 demonstrates that a combination of high conscientiousness, openness, extraversion, and low neuroticism is conducive to high EO. This finding aligns with research highlighting the importance of extraversion in entrepreneurship (Laouiti et al. 2022; Obschonka et al. 2013) and extends findings on the relationship between low emotional stability and entrepreneurial intention (Şahin, Karadağ, and Tuncer 2019; Yurrebaso, Picado, and Paiva 2021). Configuration 3 indicates that high conscientiousness, agreeableness, extraversion, and neuroticism lead to high EO. This configuration challenges the predominantly negative view of neuroticism in entrepreneurship. While neurotic individuals often struggle with anxiety and self-doubt, their heightened caution and risk assessment can also motivate them to strive for excellence (Baron, Franklin, and Hmieleski 2016; H. Zhao, Seibert, and Lumpkin 2010). Configuration 4 highlights that low levels of all Big Five traits can still lead to high EO. Such a finding challenges traditional notions of entrepreneurial profiles, suggesting that certain external factors or contextual conditions may compensate for low personality trait levels and that unconventional entrepreneurial paths may still succeed. As such, this study advances theoretical understanding by providing a nuanced view of how personality traits interact dynamically to shape EO, offering a foundation for further exploration in both academic and practical contexts.

6.2. Contributions to research on international vs. local entrepreneurs

Understanding personality traits that drive EO in both local and international entrepreneurs is vital, as it helps companies mitigate risks of personality derailers and subclinical traits (Woo et al. 2016). Research has explored how demographic factors, such as age and gender influence EO; however, less is known about the differential impact of personality traits on entrepreneurial outcomes between local and international entrepreneurs. While migrant entrepreneurship studies suggest that migrants are more likely than non-migrants to become successful entrepreneurs, empirical evidence for this

proposition remains scarce (Vandor 2021). By examining these dynamics, our study bridges this gap and provides new insights into the interplay between personality traits and EO in the context of local and international entrepreneurship.

Our findings identify four distinct configurations of personality traits that drive high EO in local and international entrepreneurs. Configuration 5 reveals that high levels of conscientiousness, agreeableness, and openness to experience are associated with high EO among local entrepreneurs. These traits align with characteristics such as acculturation to the host country (Bolzani, Fini, and Marzocchi 2020), reduced complexity (Ivanova-Gongne et al. 2021), and robust networking activities (Foley and O'Connor 2013), which collectively foster entrepreneurial success in local contexts. Interestingly, Configuration 6 shows that even low levels of all personality traits can lead to high EO among local entrepreneurs. This finding aligns with Younis, Dimitratos, and Elbanna (2022) research, which demonstrates that local Middle Eastern SMEs often internationalize regionally within proximate Islamic zones rather than distant Muslim countries.

In the context of international entrepreneurs, Configuration 7 highlights that high conscientiousness, agreeableness, openness to experience, and low neuroticism are conducive to high EO. This finding suggests that openness enables international entrepreneurs to identify global opportunities (Vinogradov and Jørgensen 2016), while risk-taking and proactiveness further strengthen their EO (J. Covin and Wales 2012). Moreover, high entrepreneurial passion and commitment (Yanita 2022), coupled with resilience, enhance their ability to navigate global challenges and recover from failure (Lafuente et al. 2018). Configuration 8 extends these findings by demonstrating that high levels of conscientiousness, agreeableness, openness to experience, and extraversion are also critical for international entrepreneurs. These traits enable them to leverage cognitive advantages, adopt optimistic business outlooks, and integrate seamlessly into diverse cultural contexts (Lo and Teixeira 2015). The findings resonate with existing literature suggesting that international entrepreneurs possess a global mindset and cultural intelligence, enabling them to merge effectively with different cultural environments (He et al. 2020). This study also explores the distinction between local vs. international entrepreneurs in each country separately. The findings of Table 5 identify eight complex configurations leading to high levels of EO in these countries. Interestingly, for domestic Jordanian entrepreneurs, two solutions are found (configurations 9 and 10), which are identical to configurations 5 and 6. For international Jordanian entrepreneurs, high EO is achieved through a combination of high B5-PT (configuration 11). This is the only solution found in this study where all Big Five elements need to be present for high EO. Surprisingly, configurations 13–16 share the same results and both domestic and international Saudi and Emirati entrepreneurs achieve high EO through a combination of high conscientiousness, agreeableness, openness, and extroversion. In addition, for domestic Saudi entrepreneurs, configuration 12 indicates that high conscientiousness, agreeableness, openness to experience, and low neuroticism are also conducive to high EO. This is identical to configuration 7.

Finally, there are very limited asymmetrical investigations into the mutual interdependence of personality traits. Evaluating the combinatorial logic in terms of substitutive and complementary relationships requires substantive knowledge (Park, Fiss, and El Sawy 2020) of personality traits. Examining whether the personality traits complement or substitute each other in producing high levels of EO sheds light on the literature on entrepreneurship. According to the results of this study, the complex interplay between personality traits supports the view that conscientiousness, agreeableness, and openness are complementary while extroversion and neuroticism are substitutes for each other in achieving high EO.

7. Research implications and limitations

The implications of this study on EO are diverse, providing actionable insights for policymakers and entrepreneurs in Jordan, Saudi Arabia, and the UAE. The identified personality configurations serve

as a foundation for crafting policy frameworks and entrepreneurial strategies tailored to these distinct regional contexts. Configuration 1 highlights the importance of a combination of high conscientiousness, agreeableness, and openness as a driver of EO. Policymakers can leverage these findings by partnering with educational institutions to embed personality development programs into curricula, aligning learning outcomes with entrepreneurial demands. In Jordan, for instance, mentorship initiatives and collaborative learning environments can foster teamwork and creativity, aiding necessity-driven entrepreneurs in overcoming resource constraints. Similarly, in Saudi Arabia and the UAE, such programs can nurture adaptable and imaginative entrepreneurs equipped to thrive in dynamic markets.

Configuration 2 emphasizes that high conscientiousness, openness, and extraversion, coupled with low neuroticism, are conducive to EO. This underscores the critical role of mental health and emotional stability in entrepreneurial success. Policymakers should integrate resources such as emotional intelligence training and mental health support into entrepreneurship programs. In Saudi Arabia, aligning such initiatives with Vision 2030 could enhance both individual and systemic outcomes. Entrepreneurs, in turn, can focus on building teams with complementary personality traits to foster adaptability and innovation in rapidly changing environments (Audretsch et al. 2024).

Configuration 3, involving high conscientiousness, agreeableness, extraversion, and neuroticism, provides a nuanced view of neuroticism. While neuroticism is often perceived negatively, it can enhance risk assessment and drive individuals to strive for excellence. Policymakers should create inclusive ecosystems that recognize the strategic advantages of diverse personality profiles. Tailored mentoring programs in accelerators and incubators, particularly in the UAE, could help entrepreneurs channel their neurotic tendencies into calculated decision-making, driving innovative outcomes.

Configuration 4 presents surprising insights, revealing that low levels of all personality traits can still lead to high EO, challenging traditional entrepreneurial profiles. This highlights the significance of external support mechanisms in enabling entrepreneurial success. Policymakers can encourage experimentation and unconventional ventures through initiatives such as grants for disruptive innovations and risk-sharing schemes. For example, in Jordan, fostering small-scale, high-impact ventures could drive entrepreneurial growth in under-resourced sectors, while in Saudi Arabia and the UAE, streamlining regulatory processes could attract innovative entrepreneurs developing novel business models.

The study also highlights the distinct dynamics of local versus international entrepreneurs. Local entrepreneurs, particularly in Jordan and Saudi Arabia, benefit from networking opportunities and community-building initiatives that amplify their conscientiousness and agreeableness (Configuration 5). Conversely, international entrepreneurs, characterized by high openness and adaptability (Configurations 7 and 8), require policies that enhance cultural intelligence and streamline market integration. As a hub for international business, policymakers in the UAE could streamline visa processes, reduce bureaucratic hurdles, and incentivize cross-border collaborations. Such measures can help international entrepreneurs navigate diverse markets successfully while driving economic growth in the region (Puumalainen et al. 2023).

Cultural norms and values play a significant role in shaping EO in the Middle East. Policymakers should ensure entrepreneurial support programs are culturally sensitive and resonate with local aspirations. For instance, community-led initiatives in Jordan can strengthen local networks, while culturally attuned funding schemes in Saudi Arabia and the UAE can encourage broader entrepreneurial participation.

As with all empirical research, this study has limitations that provide context for its findings and guide avenues for future exploration. First, the focus on Jordan, Saudi Arabia, and the UAE provides valuable insights into entrepreneurial ecosystems characterized by resource constraints, economic transformation, and global connectivity. However, these findings may not fully generalize to other regions with differing cultural, economic, or institutional contexts. For instance, entrepreneurial behaviours in Western economies or other emerging markets may exhibit alternative configurations. Expanding future research to include additional countries would allow for comparative analyses, enriching our understanding of how contextual factors interact with personality traits to shape EO.

Second, this study's cross-sectional design captures data at a single point in time, limiting its ability to account for the dynamic nature of personality traits and EO. Traits can evolve due to environmental influences, life experiences, and professional development, potentially altering their relationship with EO over time. Longitudinal research could track these changes, offering deeper insights into how entrepreneurial tendencies develop and adapt in response to shifting personal and contextual factors. Such an approach would also enable the examination of temporal causality, enhancing the theoretical and practical understanding of personality traits in entrepreneurship. Finally, this study relies on the use of fixed calibration thresholds that are not explicitly grounded in the distribution of the data. Even though alternative thresholds were chosen based on the substantive meaning of the Likert-scale response categories, which is an approach widely supported in set-theoretic methodology (Schneider and Wagemann 2012), this method does not fully account for potential skewness in the data. Although this study conducted additional checks to ensure that such effects did not produce trivial necessity results, we acknowledge that using distribution-based calibration strategies, such as percentile-based thresholds, could offer a complementary perspective and provide a more nuanced test of robustness. Future research may benefit from incorporating both theoretically anchored and empirically grounded calibrations.

8. Conclusion

Our study provides novel insights into the interplay between the Big Five Personality Traits and entrepreneurial orientation, highlighting how these traits shape the entrepreneurial tendencies of local and international entrepreneurs in Jordan, Saudi Arabia, and the UAE. On the strength of the current findings, tailoring entrepreneurial policies and support programs to align with the distinct personality configurations identified in this study will enhance the effectiveness of entrepreneurial ecosystems in these countries. By fostering culturally sensitive, inclusive, and contextually grounded initiatives, policymakers can empower entrepreneurs to navigate challenges and seize opportunities unique to their environments. Simultaneously, entrepreneurs can leverage an understanding of personality traits to strategically align their ventures with market dynamics, thereby advancing the entrepreneurial landscape in the Middle East and similar emerging economies.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix A: measurement scale

Construct		Measurement Item
Personality Traits	Extroversion*	EXT1 Am the life of the party. EXT2 Feel comfortable around people. EXT3 Start conversations. EXT4 Talk to a lot of different people at parties. EXT5 Don't mind being the centre of attention.
	Agreeableness*	ABN1 Sympathize with others' feelings. ABN2 Have a soft heart. ABN3 Feel others' emotions. ABN4 Make people feel at ease.
	Conscientiousness*	CTS1 Am always prepared CTS2 Pay attention to details. CTS3 Get chores done right away. CTS4 Like order. CTS5 Am exacting in my work.
	Neuroticism*	NTM1 Get stressed out easily. NTM2 Am easily disturbed. NTM3 Get upset easily. NTM4 Have frequent mood swings. NTM5 Often feel blue.
	Openness to Experience*	ONE1 Have a rich vocabulary. ONE2 Have excellent ideas. ONE3 Am quick to understand things. ONE4 Am full of ideas.
Entrepreneurial Orientation	Innovativeness**	INN1 I am an innovative person. INN2 I often approach tasks in unique ways. INN3 I am able to come up with new and different ideas. INN4 I am good at finding creative ways to solve problems.
	Risk Taking Propensity**	RTP1 I am willing to take higher risks for higher returns. RTP2 I would rather take risks than be overly cautious. RTP3 I enjoy the challenge of situations that many consider risky. RTP4 I believe that you need to take risks to create something of value.
	Achievement Orientation**	AO1 I have always wanted to achieve something in my life. AO2 I work hard towards new goals, even if I have already succeeded at my original goals. AO3 I am highly motivated towards success. AO4 I strive for extraordinary success.
	Proactiveness**	PAN1 I usually act in anticipation of future problems, needs, or changes. PAN2 I take the initiative whenever I have the opportunity to do so. PAN3 I am very proactive. PAN4 I tend to plan ahead on projects.
	Locus of Control**	LOC1 I believe that whether I am successful in life depends mostly on myself. LOC2 I think that what happens in my life is mostly determined by myself. LOC3 I believe that my life is determined by my own actions. LOC4 I believe that my success depends on myself rather than luck.
	Self-efficacy**	SE1 I am confident that I could deal efficiently with unexpected events. SE2 When facing difficult tasks, I am certain that I will accomplish them. SE3 I am confident that I can perform effectively on many different tasks. SE4 Even when things are tough, I can perform quite well.
	Autonomy Orientation**	ANO1 I prefer to schedule my own activities. ANO2 I prefer to determine my own routine. ANO3 I like to have the autonomy to make decisions. ANO4 I like deciding how to complete tasks myself.

Notes: *5-point scales anchored by strongly disagree to strongly agree. **7-point scales anchored by strongly disagree to strongly agree.

Appendix B: complex solutions for high EO using alternative calibration thresholds

Configuration	CTS	ABN	ONE	EVS	NTM	All data vs. different groups	Raw Coverage	Unit Coverage	Consistency
1	●	●	●			All data	0.872	0.131	0.968
2	●		●	●	○	All data	0.502	0.010	0.986
3	●	●		●	●	All data	0.388	0.008	0.985
4	○	○	○	○	○	All data	0.039	0.008	0.882
Solution coverage: 0.899; Solution consistency: 0.961									
5	●	●	●			Local	0.861	0.833	0.967
6	○	○	○	○	○	Local	0.039	0.010	0.837
Solution coverage: 0.871; Solution consistency: 0.960									
7	●	●	●		○	International	0.519	0.039	0.986
8	●	●	●	●		International	0.834	0.354	0.982
Solution coverage: 0.873; Solution consistency: 0.980									

Notes: ABN: Agreeableness; CTS: Conscientiousness; EO: Entrepreneurial Orientation; EVS: Extroversion; NTM: Neuroticism; ONE: Openness to Experience.

●: Presence of a condition.

○: Absence of a condition.

Blank cells: Ambiguous conditions.

Frequency threshold = 10.

Consistency threshold = ≥ 0.80 .

Appendix C: complex solutions for high EO amongst local vs international entrepreneurs in Jordan, KSA, and UAE using alternative calibration thresholds

Configuration	CTS	ABN	ONE	EVS	NTM	Country-Group	Raw Coverage	Unit Coverage	Consistency
9	●	●	●			Jordan-local	0.809	0.809	0.960
Solution coverage: 0.809; Solution consistency: 0.960									
10	●	●	●	●	●	Jordan-Int.	0.398	0.398	0.988
Solution coverage: 0.398; Solution consistency: 0.988									
11	●	●	●		○	KSA-Local	0.623	0.038	0.980
12	●	●	●	●		KSA-Local	0.854	0.269	0.980
Solution coverage: 0.891; Solution consistency: 0.976									
13	●	●	●	●		KSA-Int.	0.854	0.854	0.977
Solution coverage: 0.854; Solution consistency: 0.977									
14	●	●	●	●		UAE-Local	0.822	0.822	0.990
Solution coverage: 0.822; Solution consistency: 0.990									
15	●	●	●	●		UAE-Int.	0.845	0.845	0.987
Solution coverage: 0.845; Solution consistency: 0.987									

Notes: ABN: Agreeableness; CTS: Conscientiousness; EO: Entrepreneurial Orientation; EVS: Extroversion; NTM: Neuroticism; ONE: Openness to Experience; Int.: International.

●: Presence of a condition.

○: Absence of a condition.

Blank cells: Ambiguous conditions.

Frequency threshold = 10.

Consistency threshold = ≥ 0.80 .