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Article

A gender-based approach to the influence of personality traits on entrepreneurial intention

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Abstract

While previous studies have demonstrated the importance of personality traits in the decision to pursue a career in entrepreneurship, more empirical evidence is needed to explain the mechanism through which entrepreneurial intention (EI) is strengthened. Accordingly, espousing a gender-based perspective, the current paper identifies characteristics that positively affect EI in a sample of 531 students in France. A fuzzy-set qualitative comparative analysis is performed yielding four alternate combinations that are likely to lead to high EI, of which two are gender specific. The inherent findings advance previous studies by offering entrepreneurship educators in France and similar contexts a new understanding of entrepreneurial intention from a gender perspective. Similarly, the results offer first-hand evidence to inform university students' career choices.

Key words: *Gender; Entrepreneurial Intention; Career Choice; Big Five Personality Traits; fsQCA.*

1 Introduction

There is a time-honored awareness of the utility of entrepreneurship as a catalyst for development in vital social, economic and environmental frontiers. From the outset, Smith (1776) noted the protagonist role of entrepreneurs as enhancers of living standards, while Schumpeter (1934) asserted that entrepreneurs stimulate economic development through the introduction of new products and processes that displace old ones. More recently, Gennaioli et al. (2013), Amoroso & Link (2018), and Stuetzer et al. (2018) have stressed the function of human capital invested in entrepreneurship as a catalyst for economic and regional growth. On the whole, the creation of social value represents the delivery of 'societal enhancements' through wealth, knowledge and opportunity creation (Hitt et al., 2011:60). Thus, to expand entrepreneurs' capacity to meet social expectations, there is a current need to optimize an empirical understanding of the personal characteristics that are predisposed to entrepreneurship. For the context, gathering and examining evidence from France is both urgent and imperative. Even though France experienced a 12.59% year-on-year average growth in total early-stage entrepreneurial activity between 2001 and 2017 (World Bank, 2020), it is still one of the lowest in this dimension among OECD countries coupled with a higher gender gap, lagging behind the United States and other developed nations (Estay, 2004; Paul et al., 2017). Partly, this is explained by France's highly centralized innovation system, which is public rather than private sector driven (Okamuro et al., 2019; Miao et al., 2022). Similarly, Kickert (2005) and Barzelay & Gallego (2010) attest to France's 'policy innovation' being consistent with wider European public policies that inadvertently reinforce public management while attempting to stimulate entrepreneurship. There is also evidence that French universities and civic bodies have not promoted entrepreneurship with the same vigor as counterpart nations (Fayolle, 2000; Carayannis et al., 2003). Career wise, a greater proportion of French students indicate a desire

to gain employment in large organizations rather than create their own ventures (Klapper & Léger-Jarniou, 2006).

Following from the above, in the entrepreneurship field, there is a long-held assumption that students' entrepreneurial intention is predicted by individuals' unique personalities. Ab initio, this postulation was advanced by the findings of several researchers (Caliendo et al., 2014). For example, Holland (1997) demonstrated that personality is a fundamental determinant of occupational choice. Similarly, Zhao & Seibert (2006) showed that a distinction in the personality structures of entrepreneurs and managers explains people's pursuit of self-employment. Consequently, scholars have routinely explained the mechanism by which personality traits drive entrepreneurial intention through the Big Five construct (Zhao & Seibert, 2006; Zhao et al., 2010; Caliendo et al., 2014; Espíritu-Olmos & Sastre-Castillo, 2015). However, notwithstanding the validity of the Big Five in explaining personality traits disposed to entrepreneurial intention, the robustness of the construct is limited by more complex personality profiles. Chollet et al. (2016) assert that the Big Five model (which comprises openness, conscientiousness, extraversion, agreeableness, and emotional stability) does not harness trait interdependency. Other cited limitations of the Big Five construct include not capturing all personality traits (John & Srivastava, 1999), the independence of the inherent dimensions (Eysenck, 1992; Block, 1995; Digman, 1997), a weak theoretical underpinning (McAdams, 1992; Loevinger, 1994) and a rather static account of personality (Terracciano et al., 2006). Therefore, when predicated on the Big Five construct, extant studies are prone to inconclusive findings owing to the complex nature of the personality-entrepreneurial intention nexus (Elanain, 2008; Ong & Ismail, 2008). However, these limitations offer opportunities for methodological redress.

Increasingly, scholars have called for the investigation of personality traits using a configurational approach (Woodside, 2017; Kraus et al., 2018; Khedhaouria & Cucchi, 2019;

Haddoud et al., 2021). In fact, the value of a configuration technique such as fuzzy-set qualitative comparative analysis (fsQCA) is the exploration of data relationships at the case level to clarify complex and interacting attributes that shape human intention (Douglas et al., 2020). Krueger (2001) also suggested that the application of fuzzy-set techniques to observe relationships can unearth the building blocks of fundamental entrepreneurial processes. Indeed, as a set-theoretic method, fsQCA captures the complexity entrenched in combinations of attributes (Fiss, 2011).

Against this backdrop, the application of fsQCA as a methodological approach in the current study will advance the entrepreneurship education literature by shedding new light on gender differences in the relationships between the Big Five personality traits and students' entrepreneurial intention (EI). Using fsQCA, the interdependencies of openness, conscientiousness, extraversion, agreeableness, and emotional stability and how they increase or reduce entrepreneurial intention across genders can be captured. This technique has already been applied in a study by Şahin et al. (2019) in which they demonstrated the attainment of entrepreneurial intention through alternate combinations of the Big Five dimensions. However, to go further, the current study contends that there are possible gender differences and, on this basis, considers the role of gender when exploring the complex relationship between the Big Five traits and students' entrepreneurial intention. In this regard, previous findings have demonstrated distinctions between men and women in the personality trait-entrepreneurial intention nexus and solicited more evidence capturing the influence of gender (Antoncic et al., 2015; Murugesan & Jayavelu 2017; López-Núñez et al., 2020). In particular, López-Núñez et al. (2020: 4) state that "*more research is needed to better understand the relationships amongst sex, traits and entrepreneurial intention to work on specific programmes that reduce this gender gap and increase levels of female entrepreneurship*". Therefore, the findings from this investigation will offer new theoretical and practical insights into the complex personality

profiles of males and females vis-à-vis students' entrepreneurial intention. In so doing, extant inconclusive findings on the Big Five and students' EI are hereby reconciled, and a research gap is closed by capturing the gender-based complexities underlying this link. Such findings will offer key guidance to entrepreneurship educators in an effort to reduce the gender gap.

In the next section, the study proceeds with a theoretical review of the role of personality traits on entrepreneurial intention and rationalizes the need for a configurational approach. Subsequently, Sections 3 and 4 explain the data collection protocol and examine the results, respectively. Finally, sections 5, 6 and 7 presents a discussion of the findings, limitations, and perspectives for further research.

2 Literature Review

2.1 EI and personality traits: The Big Five lens

Although the role of entrepreneurs' psychological characteristics in the entrepreneurial process has gained scholars' interest (Zhao et al., 2010; Karimi et al., 2015), there is still significant scope for empirical clarity on the holistic nature and interplay of these characteristics (Mitchell et al., 2002; Antoncic et al., 2015; Obschonka & Stuetzer, 2017). While appraising the literature, there is ample evidence of personality characteristics associated with entrepreneurial intention. For example, the five-factor personality model (Zhao & Seibert, 2006), also known as the Big Five (Caliendo et al., 2014; Espíritu-Olmos & Sastre-Castillo, 2015), is frequently cited as an important aspect of character conditioning individuals' pursuit of entrepreneurship (Yeh et al., 2020). Considered a foremost reflection of personality (Kluemper et al., 2015), the Big Five theory covers five key dimensions of emotional stability, extraversion, agreeableness or kindness, openness to experience and conscientiousness. These dimensions are often used to explain human behavior, such as engagement with social media (Marshall et al., 2015), group status hierarchies (Bendersky & Shah, 2013), job performance (Barrick & Mount, 1991) and

market knowledge (Chollet et al., 2016). For the understanding of entrepreneurship aspirations, Zhao & Seibert's (2006) meta-analysis demonstrates significant differences between entrepreneurs and managers along the Big Five personality dimensions. For instance, entrepreneurs tend to score higher in conscientiousness and openness to experience but lower in neuroticism and agreeableness in comparison to managers. Predicated on this, several empirical studies (e.g., Leutner et al., 2014; Espíritu-Olmos & Sastre-Castillo, 2015; Murugesan & Jayavelu, 2017) have since investigated the relationship between these personality traits and entrepreneurial intention. The next section expands on the findings of these studies.

2.1.1 Neuroticism/emotional stability and entrepreneurial intention

Neuroticism represents individual differences in adjustment and emotional stability ranging from calm, relaxed individuals to those with a tendency for anxiety (Zhao & Seibert, 2006; Espíritu-Olmos & Sastre-Castillo, 2015). Highly neurotic individuals tend to experience negative emotions, including anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability (Zhao & Seibert, 2006), while low neurotic individuals are emotionally stable and characterized as self-confident, calm, even-tempered and relaxed (Caliendo et al., 2014; Van Ness & Seifert, 2016). Zhao & Seibert (2006) assert that entrepreneurial careers are fraught with psychological pressure due to working in typically unstructured environments, committing longer hours and often lacking a separation between work and personal life in comparison to managers. Additionally, entrepreneurs will have primary responsibility for all aspects of their venture(s) to the extent that job security is less assured than managers who can rely on the going concern of the enterprise. Consequently, an entrepreneurial career would need superior levels of self-confidence and a stronger belief in the ability to control environmental outcomes (Crant, 1996; Chen et al., 1998). Therefore, it can be argued that students' entrepreneurial intention is associated with higher levels of emotional stability and lower levels of neuroticism.

2.1.2 Extraversion and entrepreneurial intention

The second dimension of the Big Five describes the extent to which individuals are assertive, dominant, ambitious, energetic, and aspire to leadership roles. It also describes the extent to which people are active, talkative and enthusiastic (Costa & McCrae, 1992). Extraverted individuals tend to be sociable and positive, thus enabling them to develop social networks more easily (Caliendo et al., 2014; Espíritu-Olmos & Sastre-Castillo, 2015). Highly extraverted people tend to be cheerful, admire people and large groups, and seek excitement and stimulation, while less extraverted people prefer to spend more time alone and are characterized as reserved, quiet, and independent (Zhao & Seibert, 2006). Intrinsically, an entrepreneurial career requires specific personality traits that enable direct interaction with diverse constituents, including venture capitalists, partners, employees, and customers (Zhao & Seibert, 2006). Thus, Antoncic et al. (2015) affirm that individuals with a low extraversion score are unlikely to become entrepreneurs. This is because entrepreneurs must constantly build and maintain a network of suppliers, customers, employees, and other stakeholders. Hence, one can argue that extraversion is positively associated with students' entrepreneurial intention.

2.1.3 Agreeableness and entrepreneurial intention

Agreeableness is also known as friendliness and kindness. It describes a forgiving and trusting nature demonstrated by altruism and flexibility (Caliendo et al., 2014). Espíritu-Olmos & Sastre-Castillo (2015) define kindness as the tendency to be cooperative, attentive, friendly, well-meaning and modest. The aforementioned traits could be crucial when building external business networks, as individuals high in agreeableness are perceived as trusting, forgiving and caring in comparison to those with low agreeableness thought to be manipulative, self-centered, suspicious and ruthless (Costa & McCrae, 1992; Zhao & Seibert, 2006). Accordingly, Antoncic et al. (2015) found that sympathetic, warm, kind and cooperative individuals are less likely to become entrepreneurs, owing to a high ability to adjust to the norms, policies, systems, and

culture of the status quo. Practically, an entrepreneurial career might require people who are characteristically less agreeable due to slimmer margins for error and show a strong bias to get the job done over winning consensus. On this premise, agreeableness is likely to be negatively related to students' entrepreneurial intention.

2.1.4 Openness to experience/Imagination and entrepreneurial intention

Openness to experience, also known as imagination, is described as individuals' intellectual curiosity and the tendency to seek new experiences and explore novel ideas (Zhao & Seibert, 2006). An openness to experience, generally manifested in innovation, change, creativity and a strong desire to explore new or novel ideas, is at the core of recent definitions of entrepreneurship (Shane & Venkataraman, 2000; Zhao & Seibert, 2006). Moreover, openness to experience is an important psychological factor and predictor of entrepreneurial intention, as creative, imaginative, philosophical, intellectual, complex and deep-thinking individuals demonstrate a greater entrepreneurial propensity (Caliendo et al., 2014; Antoncic et al., 2015). Hence, openness to experience could be an important asset to trigger an entrepreneurial career and is therefore positively associated with students' entrepreneurial intention.

2.1.5 Conscientiousness and entrepreneurial intention

Conscientiousness indicates volition or the ability to work hard. It also indicates individuals' degree of organization, persistence, and motivation in the pursuit of goal accomplishment (Zhao & Seibert, 2006). Scholars assert that there are facets of conscientiousness, as Zhao & Siebert (2006) specify two dimensions of *achievement motivation* and *dependability*. Similarly, Van Ness & Seifert (2016) affirm that conscientiousness encompasses two components: the need for achievement and being hard-working. The *need for achievement* underscores individuals' motivation to seek optimal solutions to improve the current environment (Caliendo et al., 2014). It also underlies people's tendency to persevere with certain activities in the face of opposition (Espíritu- Olmos & Sastre-Castillo, 2015). Being dutiful or a hard worker reflects the extent to

which an individual is organized, deliberate and methodical and can be relied on to fulfil his or her own duties and bear responsibilities (Zhao & Seibert, 2006). As it pertains to entrepreneurship, Zhao & Seibert (2006) argue that conscientiousness is more important for entrepreneurs who operate in self-directed environments than for managers in established organizations with structured responsibilities, goals and monitoring systems. Ferreira et al. (2012) show that individuals with a greater need for achievement are more likely to demonstrate higher entrepreneurial intentions due to a preference for situations in which performance is rewarded by own efforts rather than extrinsic factors. However, Antoncic et al. (2015) find a nonsignificant relationship between conscientiousness and EI. A possible explanation of this finding is the distinction between entrepreneurial and administrative-managerial behavior, where planning and organizing routines may be more important for administrators and managers than entrepreneurs. Hence, despite contrasting findings, it could still be argued that conscientiousness is key to embracing an entrepreneurial career and is therefore positively associated with students' entrepreneurial intention.

2.2 The interplay of personality traits and entrepreneurial intention

Based on the preceding dialog, it is deduced that seeking an entrepreneurial career (i.e. entrepreneurial intention) is associated with higher levels of extraversion, conscientiousness and openness and lower levels of agreeableness and neuroticism (Obschonka et al., 2014). However, notwithstanding the insights from prior studies, the vast majority have considered the influence of each Big Five trait in isolation often through regression-based (net effect) techniques without assessing the interplay of these traits. This is empirically problematic, as the intention to perform a given behavior is complex and likely to be influenced by other psychological factors (Krueger & Kickul, 2006). In addition, in the decision-making process, it is normal for individuals to be simultaneously influenced by a combination of personality traits (Haddoud et al., 2021). Stroe et al. (2018) argue that net effect approaches are not optimal for

studying decision-making behavior. Hence, in relation to entrepreneurial intentions, we expect that it is the combined influence of psychological factors that generate intention and not the unique influence of isolated elements (Nowiński & Haddoud, 2019). Mezei & Nikou (2018) concur that configuration-based and explanation-oriented approaches would better interrogate and advance the literature. Likewise, in a systematic review, Kraus et al. (2018) stress the usefulness of a fuzzy-set approach in measuring entrepreneurial intention to reveal the combined influence of personal attributes that generate entrepreneurial intention. It is anticipated that a configuration approach will also address inconsistent findings that are common in the empirical entrepreneurship intention literature (Stroe et al., 2018).

By and large, there is a surge in the volume of fuzzy-set analyses in empirical entrepreneurial intention studies. Based on a study conducted in different universities in 10 European countries, Rippa et al. (2020) confirm that entrepreneurial intention and propensity do not depend only on a single driver but on the interplay of multiple factors, such as entrepreneurship education intention, university atmosphere, locus of control, attitudes toward entrepreneurship, and entrepreneurs' family background. Likewise, using a Turkish sample, Şahin et al. (2019) determined distinct combinations of personality traits in students' entrepreneurial intention involving openness to experience, conscientiousness, and the absence of extraversion alongside other factors. They [Şahin et al. (2019)] also confirmed that higher levels of EI warrant the analysis of complex patterns of the Big Five personality traits.

In summary, based on the aforementioned evidence in relation to (1) the influence of each Big Five trait on entrepreneurial intentions and (2) the complex associations underlying the personality traits-EI nexus, a first proposition emerges. Evoking evidence that greater levels of openness, extraversion, and conscientiousness, along with lower levels of neuroticism and agreeableness, are associated with high entrepreneurial intention (Zaremohzzabieh et al., 2019), we propose the following:

P1. Discrete combinations of at least two of the following traits, low neuroticism, high extraversion, low agreeableness, high openness to experience and high conscientiousness, are associated with high entrepreneurial intention among students.

2.3 Gender differences in the Big Five personality traits

The extant literature has devoted substantial attention to gender differences with respect to the Big Five personality traits in the analysis of human behavior. Seemingly, these differences can be explained by intrinsic biology and social culture (Schmitt et al., 2008). However, studies have provided conflicting findings, although a pattern may be discerned. In a recent systematic review on gender differences across the Big Five personality traits, Vedel (2016) reported that females tend to score higher in agreeableness, conscientiousness, and neuroticism, whereas mixed evidence was found in relation to openness and extraversion.

From a psychological perspective, Costa et al. (2001) assert that females tend to score higher in negative affectivity and are relatively, more concerned with feelings. To explain this, Soto et al. (2011) believe that high neuroticism, anxiety and depression among females results from significant social and psychological difficulties faced during adolescence, including an awareness of negative gender expectations, stereotypes, body image concerns, and negative self-perceptions. In the same vein, Weisberg et al. (2011) attribute neuroticism among females to higher levels of anxiety, depression, self-consciousness and vulnerability.

For the higher scores in agreeableness exhibited by females, Weisberg et al. (2011) argue that Canadian females tend to develop more agreeable traits than males because of a higher sense of compassion, politeness and enthusiasm, which reflects sociability and positive emotionality. To this extent, they are more trusting than men. In other studies, Vecchione et al. (2012) contended that female Italian students have a penchant for agreeableness because of their advanced interpersonal skills, empathy and friendliness, while males score higher in emotional

stability. Similarly, Shchebetenko et al. (2020) found that women scored much higher in agreeableness. In Vedel's (2016) review, it was reported that Clariana (2013), Larson et al. (2007), Rubinstein (2005), and Vedel et al. (2015) found that females showed significantly higher scores in agreeableness than males.

With respect to conscientiousness, Vrontis & Thrassou (2013) support the hypothesis that masculinity is inversely linked to conscientiousness. Equally, Else-Quest et al. (2006) suggested that females were found to score higher than males in conscientiousness, while Rahafar et al. (2017) argued that consciousness is linked to femininity, and high conscientiousness reflects being more vigilant and punctual (Back et al., 2006; Werner et al., 2015). Vedel's (2016) review confirmed this trend in Clariana (2013), Rubinstein (2005), and Vedel et al. (2015), wherein females showed significantly higher conscientiousness than males. As for openness, mixed evidence abound. Although several studies report that males score higher in openness (Marsh et al., 2013; Obschonka et al., 2014), Weisberg et al. (2011) provide evidence that females are more open to new experiences than males. They identify females as having a greater recognition of aesthetics and feelings, while males have more confidence in their intellectual ability. In the same way, creativity, which may manifest itself not only in the identification of opportunities but also in the generation and implementation of those ideas, was found to highly increase entrepreneurial intention among females compared to males (Dimitriadis, et al., 2018).

Regarding extraversion, Shchebetenko et al. (2020) found that men scored slightly higher. Similarly, using a sample of Tunisian entrepreneurs, Hachana et al. (2018) evidenced that men score high on extraversion due to disparities in social norms influenced by culturally and religiously conservative values. However, when conceptualizing extraversion through enthusiasm and assertiveness, Weisberg et al. (2011) argued that women score higher in the former, while men do so in the latter. Costa et al. (2001) found that men sore higher in

assertiveness and excitement seeking, whereas women show higher scores in warmth-related aspects.

Based on the above evidence, one may conclude the following. To develop an entrepreneurial intention, female students need a configuration of traits encompassing lower levels of agreeableness and neuroticism to regulate the prevalence of these traits. This logic follows the literature suggesting that low agreeableness and low neuroticism are key predictors of entrepreneurial intention. Second, it is presumed that male students need a combinations of traits that includes higher levels of conscientiousness, which is found to be a driver of entrepreneurial intention. Hence, the following propositions are contemplated:

> **P2.** For female students, combinations associated with high entrepreneurial intention are likely to involve low agreeableness and low neuroticism, alongside other traits.

> **P3.** For male students, combinations associated with high entrepreneurial intention are likely to involve high conscientiousness, alongside other traits.

3 Data and methodology

3.1 Sample and data collection

This study adopts a gender based approach to investigate the complex relationship between personality traits and EI among students based in France. Student samples are particularly suitable for examining EI since they [students] face an immediate career choice (Krueger et al., 2000; Fitzsimmons & Douglas, 2011). They are also a major force and talent pool for entrepreneurship (Uslay et al., 2002). The current investigation observed students in one business school in southern France following precedent in previous studies (e.g., Jonson et al., 2015; Pfeifer et al., 2016) using an online questionnaire translated from English to French. The translation was rigorously checked by the research team for consistency, and a pretest was conducted with 20 students to ensure clarity of the questions and their appropriateness to

address the research objectives. This afforded the opportunity to modify and distribute a clearer and well-structured questionnaire (Aydiner et al., 2019). A link inviting respondents to complete the online survey was e-mailed to students, and they were assured of confidentiality. They were also informed of the strictly scientific purpose of the study and that participation was both voluntary and anonymous. Data collection was undertaken in September 2017 at the start of the academic year.

In terms of sampling, the study adopted a nonprobability sampling technique. It is widely agreed that this method allows researchers to ensure the appropriateness of participants (Carland et al., 2001) and yield quality data when sufficient respondents are obtained. Therefore, in this study, mitigating action was taken to achieve a sample size of 531 students, which should sufficiently compensate for the generalizability limitation. The sample comprised of undergraduate (48.4%) and postgraduate (51.6%) students. In terms of gender, the sample included 285 females (53.7%) and 246 males (46.3%). This corresponds to the gender distribution in university education in France (OECD indicators, 2018) and similar studies such as Peterson & Merunka (2014). The age of students varied between 18 and 27, with the majority (39%) being between 21 and 22 years. Regarding relevant tuition, 161 students (30.32%) had been exposed to entrepreneurship education courses during their enrollment.

3.2 Measurement scale

To avert measurement errors, all scales were adopted from previous studies. Respondents were asked to rate their agreement or disagreement to a set of statements using a 5-point Likert scale ranging from 1 'strongly disagree' to 5 'strongly agree'. The outcome variable, *EI*, was measured using the scale developed and validated by Liñán & Chen (2009). The measure has been extensively used in previous studies (e.g., Karimi et al., 2015; Karimi et al., 2016; Miralles et al., 2016) and comprise six items, including *"my professional goal is to become an entrepreneur"*. The independent variables of personality traits were measured using the brief

Big Five personality scale (Donnellan et al., 2006), which is routinely adopted in psychology and management studies (e.g., Methot et al., 2016; Kim et al., 2017). Four items were utilized for each psychological dimension, including several reversed statements, as shown in appendix 1: *extraversion* (e.g., "I am the life of the party"), *agreeableness* (e.g., "I sympathize with others' feelings"), *conscientiousness* (e.g., "I get chores done right away"), *neuroticism* (e.g., "I have frequent mood swings"), and *openness to experience* (e.g., "I have a vivid imagination"). Additionally, to check for measurement bias, a post hoc Harman's one-factor test was performed (Lings et al., 2014). The single factor accounted for less than 50% of the total variance, suggesting no major risk of common method bias.

4 Results

4.1 Scales' reliability and validity

Prior to conducting fsQCA analysis, it is necessary to assess measurement quality through constructs' reliability and validity. In this study, a structural equation modeling protocol was applied using WarpPLS version 7.0 (Kock, 2020). Table 1 depicts the scores for composite reliability (CR), Cronbach's alpha (α) and Average Variance Extracted (AVE). While some α scores were below the threshold, the corresponding composite reliability scores were satisfactory. In fact, α is known to be sensitive to the low number of items, and in such cases, CR can be considered instead. Hence, the overall levels are acceptable and confirm no major reliability or convergent validity issues. Furthermore, the square roots of AVE were also assessed and indicated good discriminant validity. However, one item from the neuroticism construct had to be dropped due to a low factor loading.

Table 1

4.2 Configurational analysis (fsQCA)

Developed by Ragin (2000), fsQCA is a technique based on a Boolean algebra system that captures the set of conditions [usually in combinations] sufficient to predict an outcome (Fiss

et al., 2013). This process involves the inclusion of contrarian cases that deviate from a general trend in a data set (Woodside, 2014), and, by so doing, the technique minimizes issues of unobserved heterogeneity (Schneider & Wagemann, 2010). In this study, the set of conditions associated with EI are the five personality traits previously enumerated. The selection of these traits was based on the Big Five model following Greckhamer et al.'s (2008, 2018) stipulation for the use of theory as a guide in the selection of conditions expected to predict an outcome. The software used here was fsQCA.3.0 (Ragin & Davey, 2016).

The first step in fsQCA analysis is the 'calibration' step, where all variables are 'fuzzified' by converting Likert scales into fuzzy scores. To do this, three qualitative thresholds representing fuzzy-set scores are represented through the identification of three corresponding values in the data (Ragin, 2009). The thresholds set are (1) for full membership, (0.5) for crossover points and (0) for full nonmembership (Ragin, 2009). Several methods have been used in previous works to decide on the thresholds. Here, 95th, 50th and 5th percentiles can be used. However, Greckhamer et al. (2018: 489) advise that "sample-based calibration should be avoided whenever possible". In the case of Likert scales, the thresholds could be 4 (agree), 3 (neutral), and 2 (disagree) (Pappas & Woodside, 2021) or 5, 3 and 1. In this study, upon inspecting the data distribution, we followed the former suggestion (4, 3 and 2), to represent full membership, crossover point and non-membership.

4.2.1 Necessity analysis for high entrepreneurial intention

Necessity analysis identifies the conditions (variables) that are deemed necessary for respondents to express high EI. However, even if necessary, these conditions may not be sufficient to exhibit the observed behavior (Kent, 2015). For a condition to be necessary, a behavior needs to exhibit a consistency score of at least 0.90 (Greckhamer et al., 2018) and a coverage exceeding 0.75 (Legewie, 2013). Table 2 shows the results, and as evident, none of the Big Five traits is a necessary condition for high entrepreneurial intention.

Table 2

4.2.2 Sufficiency analysis for high entrepreneurial intention

Table 3 presents the intermediate solution[1] with key combinations associated with high EI. To capture the role of gender, the latter was added as an additional condition. Prior to this step, truth tables containing logically possible combinations of conditions are generated (Ragin et al., 2008). Accordingly, the number of configurations is 2^k (where k refers to the number of conditions), i.e., $2^6 = 64$ possible configurations (the truth table is available upon request). To identify the relevant configurations, frequency and consistency thresholds need to be determined. The frequency threshold refers to the minimum case number combinations for inclusion worth investigating. In this study, as per Ragin's (2008) suggestion to use higher thresholds for large samples and for the sake of parsimonious results, we chose 10 cases as a minimum threshold. This captures 77% of the data, which is close to Greckhamer et al.'s (2008) recommendation of 80%. The choice of this threshold is also due to our focus on students as opposed to firms or countries. For the consistency threshold, we followed Ragin's (2008) suggestion that consistency scores should be at least 0.75 for a combination to be consistent. While more conservative thresholds can be adopted (e.g., 0.80 and 0.90), we opted for a lower value to allow for combinations for both genders to be included, since configurations relevant to female students tended to show lower consistency scores. We have, however, followed Greckhamer et al.'s (2018) recommendation of considering PRI (proportional reduction in inconsistency) too and ensured that this was greater at least 0.65 as per Greckhamer and Gur's (2021) suggestion.

In Table 3, the solutions associated with high EI among students are presented, alongside measures for both consistency and coverage for each solution. On the one hand, similar to the

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[1] Three solutions are typically provided by fsQCA, namely: parsimonious, complex, and intermediate. Kent (2015) recommends interpreting the intermediate solution as it is a midpoint between the parsimonious and the complex solutions.

significance value in multivariate techniques, consistency reflects "*the degree to which the cases sharing a given combination of conditions . . . agree in displaying the outcome in question*". On the other hand, coverage captures "*the degree to which a cause or causal combination 'accounts for' instances of an outcome*" (Ragin, 2008:44). Coverage, which reflects the empirical importance of sufficient configurations (Ordanini et al., 2014), could be raw or unique. Raw coverage is a combination that could overlap with other combinations, while unique coverage is exclusive to a combination (Beynon et al., 2016). Overall solution coverage is also presented to indicate the extent to which outcomes can be determined by a set of configurations [similar to the R-squared value in multivariate methods] (Woodside, 2014). Additionally, the core versus complementary (peripheral) conditions are also highlighted. Core conditions exhibit a strong association with the outcome, whereas peripheral elements are those with a weaker association (Fiss, 2011). Core conditions are highlighted in bold. As per Table 3, four student configurations associated with high EI emerge. Two solutions were universally applicable, while the other two were gender specific

Starting with the two profiles exhibited by male and female students, they were characterized by high emotional stability (low neuroticism) and high openness to experience (as core) as well as high agreeableness. However, the first adds high extraversion, while the second involves high conscientiousness. Both solutions have consistency scores of 0.80 and raw coverage of 0.50 and 0.49, respectively, which means that the empirical relevance of both configurations is relatively similar. Based on these two paths, proposition 1, which suggests complex relationships underlying the Big Five-EI nexus, is supported, yet only partially when considering the traits observed. This is because while high openness and low neuroticism were confirmed as key drivers of EI, contrary to prediction, high agreeableness has also surfaced as an important asset to develop students' entrepreneurial intention.

For gender disparities, two distinct profiles emerged. Here, the third profile seems to be mainly shared by female students and involved high openness to experience, high conscientiousness and high agreeableness, with low extraversion as a core condition. Alternatively, the fourth profile was mainly exhibited by male students and included high openness to experience, high conscientiousness, and high agreeableness, yet this time with high extraversion. These two configurations have a lower empirical relevance than the previous two. Based on these findings, proposition 2 is not supported in relation to females' greater need for low neuroticism and low agreeableness. Proposition 3 which suggested that male students need high conscientiousness among other traits to achieve higher EI is accepted, since the profile of male students did exhibit this trait. The overall solution coverage is 0.63, reflecting the proportion of entrepreneurial intention covered by the four paths.

Table 3

Furthermore, the "absence" of a given outcome can be of interest in configurational analyses (Kent, 2015; Woodside & Zhang, 2013; Nowiński & Haddoud, 2019; Greckhamer et al., 2018). In fsQCA, a negation analysis can also be performed to explore combinations of low EI. However, in the current study, only two combinations reached the consistency and PRI thresholds, and these had a minimal number associated with them, implying marginal coverage. Here, the two solutions are applicable to female students and involve the combination of high neuroticism, low imagination with either agreeableness and low extraversion and conscientiousness or conscientiousness and extraversion with low agreeableness. The raw coverage of these two solutions was 0.06, which is rathemp('àr low to be empirically relevant.

5   Discussion

This study advances previous research on the drivers of students' entrepreneurial intention by adopting a gender-based approach to uncover the effect of combined personality traits in the

French context. While the present findings support the idea that students are attracted to careers that match their personality traits (e.g., Zhao & Seibert, 2006), it goes one step further by capturing the complex associations explaining this nexus while also considering gender differences. Specifically, the study shows that students' entrepreneurial intention in France is associated with multiple combinations of personality traits and that some are gender specific. In fact, the findings revealed that the same traits could have a positive or negative effect depending on gender.

On the one hand, this study proves the complex nature of entrepreneurial intention, as highlighted in previous works (Nowiński & Haddoud, 2019; Nakara et al., 2020; Douglas et al., 2020), and echoes findings on the complexity underlying the personality trait-EI nexus wherein multiple configurations of such traits are associated with entrepreneurial intention (Şahin et al., 2019). Likewise, the lack of necessary conditions was also confirmed vis-à-vis entrepreneurial intention (e.g., Beynon et al., 2020; Xie et al., 2021). On the other hand, the current study makes a new contribution by capturing the role of gender in shaping this link. Based on gender differences underlying the relationship between personality traits and entrepreneurial intention (Antoncic et al., 2015; Murugesan & Jayavelu, 2017; López-Núñez et al., 2020), the findings discern two discrete gender profiles that are likely to be associated with high EI among students in France. The universal and gender-specific combinations are now discussed

5.1 Universal entrepreneurial profiles

In this study, two distinct profiles of students demonstrating high entrepreneurial intention emerged in France, and these profiles were not gender specific. They were both open to experience, emotionally stable and agreeable, but the first included extraversion, while the second comprised conscientiousness. In this profile, the combination of emotional stability and high openness to experience was core to entrepreneurial intention among the students. In fact, the association between these two traits and entrepreneurial intention has been demonstrated in

several past studies (Zhao & Seibert 2006; Caliendo et al., 2014; Van Ness & Seifert, 2016; Caliendo et al., 2014; Antoncic et al., 2015). There have also been assertions that curiosity, creativity, the tendency to seek new experiences and explore novel ideas are at the core of entrepreneurship (Shane & Venkataraman, 2000; Zhao & Seibert, 2006). Likewise, self-confidence and the ability to regulate emotions characterizing individuals with low neuroticism help to deal with challenges associated with an entrepreneurial career as opposed to the relatively safer employment route (Caliendo et al., 2014; Van Ness & Seifert, 2016). Therefore, we argue that in France, being open, coupled with stable emotions, will not only help students' imagination and idea generation. In addition, they will be able to negotiate the hurdles associated with this [idea creation and imagination] in a calm way by not allowing the uncertainty of new experiences to impede the formation of entrepreneurial intention and embrace an entrepreneurial career.

In contrast, the association of high agreeableness with high entrepreneurial intention among students in France is inconsistent with previous studies arguing that this trait decreases entrepreneurial prospects (Zhao et al., 2010; Antoncic et al., 2015). In fact, it is thought that the sympathetic, warm, kind and cooperative side of agreeable people prevents them from developing an entrepreneurial intention as they prioritize agreement over task completion. To become entrepreneurs, it is believed that they need a strong bias to get the job done over winning consensus (Antoncic et al., 2015). However, in this study, we posit that the counter effect of agreeableness can potentially be regulated by the presence of other supportive traits. In the case of these two profiles, stable emotions may have potentially prevented the disadvantages of agreeableness from jeopardizing task completion. In addition, emotionally stable people can exploit the positive aspects of their agreeableness, such as friendliness and cooperation (Espíritu-Olmos & Sastre-Castillo, 2015), to build external business networks, which could stimulate the choice of an entrepreneurial career (i.e., entrepreneurial intention) among French

21

business students. This finding corroborates Haddoud et al. (2021), who, although investigating entrepreneurial resilience among Egyptian bazaar owners rather than entrepreneurial intention, concluded that agreeableness can have a positive influence when combined with emotional stability.

Along with high emotional stability, openness to experience and agreeableness, the two student profiles favoring an entrepreneurial career in France exhibited either high extraversion or high conscientiousness. In this regard, Zhao & Seibert (2006) argue that conscientiousness is important for entrepreneurs operating in a self-directed environment, as opposed to managers working within a directed environment such as companies and organizations. For extraversion, Antoncic et al. (2015) explain that this trait is key for building and maintaining relationships with various stakeholders. Leutner et al. (2014) also found that extraverted individuals are more likely to behave entrepreneurially and venture into new business creation. However, it could be argued that, for this group, these two traits are substitutable. In fact, issues arising from being less conscientious may be attenuated by support gained from good external relationships, as derived from extraversion and agreeableness. On the other hand, the potential loss in external support due to being introverted could be offset with a more conscientious approach in pursuing an entrepreneurial career.

In summary, consistent with Şahin et al. (2019), the configuration approach adopted in this study shows that the entrepreneurial intention of students in French business schools is driven by combinations rather than the influence of single factors. However, this study takes these findings further by uncovering additional paths that are gender specific. These are now discussed.

5.2 Gender specific profiles

In addition to the universal profiles, two further gender-specific combinations leading to students' entrepreneurial intentions emerged in the French business school context. Starting

with the common traits, both profiles shared high openness to experience, which confirms the important role of this attribute discussed in the previous section. Additionally, agreeableness was once more confirmed as a driver of entrepreneurial intention, but this time with the presence of conscientiousness. Likewise, we posit that persistence and the thoroughness cultivated from being conscientious helps agreeable individuals in their task completion, which was argued to be jeopardized by the nature of agreeableness (Antoncic et al., 2015).

However, in addition to these shared traits, the profile relevant to female students in France was characterized by low extraversion (being core), whereas male students' profile featured high extraversion. As mentioned above, extraversion can help students build and maintain external relationships and tends to be associated with larger personal networks (Antoncic et al., 2015; Selden & Goodie, 2018), which could influence them in their entrepreneurial intention. In fact, extraverted people tend to be sociable and thus have access to a wide network (Caliendo et al., 2014; Espíritu-Olmos & Sastre-Castillo, 2015). For this group of male students, it could be said that the general biased support towards male entrepreneurship in society, along with other traits such as openness to experience and conscientiousness, predisposes them to a career in entrepreneurship. In contrast, female students developed entrepreneurial intentions with a lack of extraversion being core, along with high openness, emotional stability and conscientiousness. The lack of extraversion was not detrimental in this case and was in fact core to developing entrepreneurial intention.

Although counterintuitive, the positive role of low extraversion among female learners could be explained by the prevalent stigma against female entrepreneurship. In fact, Haus et al. (2013) acknowledge that entrepreneurship is culturally perceived as a masculine activity that is less suited to women. In France, a report by the OECD (2016) acknowledged that the gap between men and women expressing a preference for starting their own business was slightly higher compared to other member states, and the proportion of these women was lower than that in the

UK, Canada and the US. Hence, when females show extraversion, they will be more likely to create networks and build relationships that may not be supportive of female entrepreneurship. In France, networks formed by extroverted female students may hold the reverse effect and potentially discourage them [female students] from towing an entrepreneurial path. In this regard, a recent study by Powazny & Kauffeld (2021) concluded that, for female students, extraversion is negatively associated with gender homophily. That is, extravert female students tend to create less homophilic (i.e., same gender) general ties. Thus, one may infer from such findings that introvert female students might still form ties but with other female students, who may be more supportive of entrepreneurship compared to male students with whom extravert females are more likely to create ties. In summary, Chollet et al. (2016) maintain that a better understanding of personality traits plays a significant role in enhancing social capital, especially among female entrepreneurs.

6 Implications and limitations

Understanding the psychology of choosing entrepreneurship is at the core of contemporary entrepreneurship research, and this study explains the influence of personality traits on students' EI in French business schools. By applying fsQCA, it can be concluded from the inherent findings that forging an entrepreneurial career is underlined by a complex combination of personality traits. The study suggests that psychological characteristics are key to stimulating EI in the present context, but it is their interaction that is likely to be most effective. Thus, this paper corroborates previous evidence (Beynon et al., 2016; Kraus et al., 2018; Rey-Martí et al., 2016; Şahin et al., 2019; Haddoud et al., 2021) on the efficacy of fsQCA in entrepreneurship research. It also promotes the recognition of fsQCA as an analytical tool that is rapidly evolving in entrepreneurship (Kraus et al., 2018; Douglas et al., 2020).

More importantly, this study reveals the need to capture gender differences when assessing the complex influence of personality traits on entrepreneurship among students in France.

Precisely, the fsQCA analysis revealed additional configurations of traits that were gender specific. In the grand scheme, the insights arising from this study pose important implications for entrepreneurship educators in French business schools and other European contexts. An objective personality assessment based on the Big Five personality dimensions yields ample insights to improve entrepreneurship education. Notably, an assessment taking into account gender differences when considering the Big Five personality dimensions will lead to the design of more effective entrepreneurship education. In turn, this will also help in closing the "large unexplained gender gap in entrepreneurship" (Caliendo et al., 2015: 226) in the French and other contexts. The purpose of this study is not necessarily to provide definitive gender-specific profiles but instead to raise awareness of the need to consider the role of gender when promoting entrepreneurship as a career choice.

This study suggests that entrepreneurship educators in France and other similar contexts should simultaneously consider participants' personality traits and gender differences when designing their programmes. However, while the current findings revealed several aspects in this regard, we will focus on the key findings that stood out from previous works. First, our study indicates that educators should not necessarily see agreeableness as an inhibiter of entrepreneurship, as portrayed in previous works. Instead, with the right balance of emotional stability and/or conscientiousness, agreeableness can become an asset for developing entrepreneurial intention behavior in both male and female students. Second, while extraversion can play a positive role in enabling entrepreneurship as a career choice (alongside other traits), for some female students, this may not hold. We believe that the potential adverse influence of extraversion might be due to the negative perception of female entrepreneurship in society. Hence, educators are advised to guide female learners to be more selective in networking and avoid unsupportive groups. Third, although openness to experience has been confirmed to be key to students' entrepreneurial intentions, educators should be aware that it works in tandem with better

emotion control. The pair of low neuroticismand openness to experience was core to the two universal profiles. In fact, the control of emotions appears to be a vital element in being drawn to an entrepreneurial career.

As with all empirical investigations, the current research has limitations. First, the study uses self-reported measures of both personality traits and entrepreneurial intention. We acknowledge that such measures are susceptible to several biases (Podsakoff et al., 2003). Thus, future research can address this measurement shortcoming by employing more objective measurement instruments for the conditions and outcomes. Second, while the Big Five personality traits are used as conditions to achieve a high level of entrepreneurial intention, other possible conditions that predict this outcome have not been tested. Future research could focus on testing associations although tailored to conditions that are unique to their settings. Moreover, it is recognized that the influence of the Big Five traits on entrepreneurial intention can also be moderated by other personal characteristics such as age, race, ethnic background and work experience, is not excluded. Future studies are invited to consider and examine such antecedents. Last, given the cross-sectional nature of the data in this study, causal inferences should be made with caution. New studies can take a longitudinal approach to confirm causality.

7 Conclusion

To conclude, our study offers fresh insights into the personality traits related to male and females' entrepreneurial intention, and how entrepreneurship education provision can be optimized in France. On the strength of the current findings, finetuning teaching and learning to accommodate students' psychological profiles and gender differences will allow entrepreneurship programs to boost female entrepreneurship. In the same stroke, the gap between male and females' entrepreneurial intention can be minimized in France and similar settings.

Variable	Dimensions	Items	Factor loadings
Big Five personality traits	Extraversion	Am the life of the party.	0.568
		Don't talk a lot. (R)	0.786
		Talk to a lot of different people at parties.	0.762
		Keep in the background. (R)	0.775
	Agreeableness	Sympathize with others' feelings	0.802
		Am not interested in other people's problems. (R)	0.739
		Feel others' emotions.	0.618
		Am not really interested in others. (R)	0.661
	Conscientiousness	Get chores done right away.	0.697
		Often forget to put things back in their proper place. (R)	0.729
		Like order.	0.767
		Make a mess of things /Mess up. (R)	0.737
	Neuroticism	Have frequent mood swings.	0.832
		Am relaxed most of the time. (R)	0.595
		Get upset easily.	0.783
		Seldom feel blue. (R)	-
	Openness	Have a vivid imagination.	0.732
		Am not interested in abstract ideas. (R)	0.612
		Have difficulty understanding abstract ideas. (R)	0.647
		Do not have a good imagination. (R)	0.771
Entrepreneurial Intention		I am ready to do anything to be an entrepreneur	0.904
		My professional goal is to become an entrepreneur	0.936
		I will make every effort to start and run my own firm	0.865
		I am determined to create a firm in the future	0.941
		I have very seriously thought of starting a firm	0.878
		I have the firm intention to start a firm someday	0.920

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Table 1: CR, Cronbach's α and AVE of the study constructs

	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness	EI
CR	0.81	0.80	0.82	0.78	0.78	0.96
Cronbach's α	0.69	0.66	0.71	0.58	0.63	0.95
AVE	0.53	0.50	0.53	0.55	0.48	0.82

Table 2: Necessity Analysis for High EI

	Consistency	Coverage
Extraversion	0.76	0.70
~Extraversion	0.33	0.71
Agreeableness	0.88	0.67
~Agreeableness	0.18	0.76
Conscientiousness	0.76	0.69
~ Conscientiousness	0.31	0.71
Neuroticism	0.36	0.66
~Neuroticism	0.72	0.72
Openness	0.81	0.73
~ Openness	0.28	0.65

Table 3: Intermediate Solutions for High EI.

	Extra	Agree	Consc	Neuro	Open	Gender	Raw Coverage	Unique Coverage	Consistency
1	●	•		○	●	*Males/Females*	0.50	0.07	0.80
2		•	•	○	●	*Males/Females*	0.49	0.04	0.80
3	○	•	•		•	*Females*	0.12	0.02	0.76
4	●	•	•		•	*Males*	0.26	0.03	0.85
Solution Coverage			0.63		**Solution Consistency**			0.78	

Frequency Cutoff: 10, Consistency Cutoff: 0.76

● = *Presence of core condition*
○ = *Absence of core condition*
• = *Presence of complementary condition*
◦ = *Absence of complementary condition*
Blank Cells = Presence or absence does not matter.

Extra: Extraversion; **Agree**: Agreeableness; **Consc**: Conscientiousness; **Neuro**: Neuroticism; **Open**: Openness