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The Role of Personality Traits in Shaping Sustainable Entrepreneurial Intentions: Mediating Effects of Entrepreneurial Vigilance Among University Students

Le rôle des traits de personnalité dans la formation des intentions entrepreneuriales durables : effets médiateurs de la vigilance entrepreneuriale chez les étudiants universitaires

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Abstract

In response to the growing complexity of the labor market, characterized by the instability of traditional jobs and technological transformations, entrepreneurship is emerging as a credible alternative for employment and social mobility. In this context, the study of psychological determinants of entrepreneurial behavior, particularly personality traits, is attracting increasing interest, although empirical results remain mixed. Moreover, entrepreneurial vigilance is seen as a key cognitive resource for identifying opportunities. This study examines the effect of personality traits on students' sustainable entrepreneurial intention, focusing on the mediating role of entrepreneurial vigilance. Based on a hypothetico-deductive approach and the PLS-SEM method, the analysis conducted among 162 students highlights the interaction between individual dispositions and cognitive vigilance, offering implications for entrepreneurship education and public policy.

Keywords: Sustainable entrepreneurship; Entrepreneurial vigilance; Personality traits; Sustainable entrepreneurial intention; Psychological determinants.

Résumé

Face à la complexité croissante du marché du travail, marquée par l'instabilité des emplois traditionnels et les mutations technologiques, l'entrepreneuriat s'impose comme une alternative crédible pour l'emploi et la mobilité sociale. Dans ce contexte, l'étude des déterminants psychologiques du comportement entrepreneurial, notamment les traits de personnalité, suscite un intérêt croissant, bien que les résultats empiriques restent hétérogènes. Par ailleurs, la vigilance entrepreneuriale apparaît comme une ressource cognitive essentielle à l'identification des opportunités. Cette étude analyse l'effet des traits de personnalité sur l'intention entrepreneuriale durable des étudiants, en examinant le rôle médiateur de la vigilance entrepreneuriale. Basée sur une approche hypothético-déductive et la méthode PLS-SEM, l'analyse menée auprès de 162 étudiants met en lumière l'interaction entre dispositions individuelles et vigilance cognitive, offrant des implications pour l'éducation entrepreneuriale et les politiques publiques.

Mots-clés: Entrepreneuriat durable; Vigilance entrepreneuriale; Traits de personnalité ; Intention entrepreneuriale durable; Déterminants psychologiques.

Introduction

In the face of rapidly shifting market dynamics and increasing volatility in the global job market, entrepreneurship has emerged as a compelling alternative to traditional employment pathways. This growing appeal stems from multiple factors, including the structural instability of conventional labor markets, accelerated technological innovations, and the expansion of the digital economy. In such a context, a growing number of individuals, particularly among the younger population, are turning to entrepreneurial ventures as viable means to achieve professional fulfillment, economic independence, and long-term career sustainability.

Entrepreneurship is now recognized as a vital component of socio-economic development for several reasons. At the individual level, it enhances employability and income-generating potential, while also providing avenues for personal growth and self-determination. On a broader societal scale, entrepreneurial activities can drive inclusive economic development, foster upward social mobility, and promote equal access to economic opportunities. Consequently, entrepreneurship is increasingly viewed as a strategic tool for addressing structural unemployment and advancing social equity.

This recognition has led policymakers and governments to intensify efforts aimed at fostering entrepreneurial mindsets, particularly among university students, a demographic considered highly receptive to innovation and change (Merrill et al., 2008; Kim, 2018). In parallel, academic research has focused on identifying psychological and contextual determinants that influence entrepreneurial orientation. Among these, personality traits have emerged as key predictors of entrepreneurial intention. Although early empirical investigations into the personality–entrepreneurship nexus often produced mixed findings (Zhao et al., 2010), more recent studies have demonstrated a more consistent relationship, particularly through the lens of the Big Five personality traits and other specific constructs such as the need for achievement (Kerr et al., 2018; Wang et al., 2016).

To resolve earlier inconsistencies, scholars have increasingly explored the role of mediating and moderating variables that may influence this relationship (Woo, 2018; Farrukh et al., 2018). One such construct is entrepreneurial vigilance, a cognitive capability originally conceptualized by Kirzner (1999), referring to an individual's alertness to emerging business opportunities. Entrepreneurial vigilance enables individuals to develop an intuitive awareness of market inefficiencies, allowing them to identify gaps and capitalize on changes in the external environment. Shane (2000) emphasized that opportunity recognition is contingent on the capacity to transform information and knowledge into actionable insights. Similarly, Tang et

al. (2012) described entrepreneurial vigilance as a process involving the accumulation, filtering, and transformation of information to facilitate opportunity identification. Moreover, Solesvik et al. (2013) underscored the importance of both general and specific human capital in enhancing vigilance, thus empowering individuals to better recognize and exploit entrepreneurial opportunities.

Against this backdrop, the present study seeks to examine the relationship between personality traits and sustainable entrepreneurial intentions among university students. More specifically, it aims to identify the personal characteristics that nurture long-term entrepreneurial commitment and ecological awareness. By incorporating entrepreneurial vigilance as a mediating variable within the conceptual framework, this research endeavors to deepen our understanding of how individual traits and cognitive capabilities jointly contribute to opportunity recognition and entrepreneurial engagement. Accordingly, the central research question guiding this study is:

"To what extent do personality traits influence sustainable entrepreneurial intention through the mediating effect of entrepreneurial vigilance?"

Finally, the results of this study will have important practical implications. They will enable policymakers and educators to design targeted support programs to encourage entrepreneurship among young people. By identifying the personality traits associated with strong entrepreneurial potential, this research can also help businesses recruit and develop talent equipped with the necessary skills to succeed in a constantly evolving business environment. Ultimately, this study aims to contribute to the promotion of sustainable entrepreneurship in Morocco, thereby fostering more balanced and lasting economic and social development.

1. Theoretical and Conceptual Background

1.1. Personality Traits

Personality traits are enduring and distinguishable characteristics that systematically influence individuals'reactions to various environmental conditions and social contexts. Theoretical discussions in personality psychology have long emphasized the significance of these traits in shaping behavioral patterns and decision-making processes (Costa & McCrae, 1992; Judge et al., 2002). Within this framework, scholars argue that personality traits serve as consistent predictors of individual behavior across diverse life domains, including entrepreneurship.

In recent years, the relationship between personality and entrepreneurial outcomes has garnered increasing empirical support, particularly through comprehensive meta-analyses. Notably, studies by Zhao and Seibert (2006) and Brandstätter (2011) have established the relevance of

the Big Five personality dimensions in forecasting entrepreneurial intentions and performance levels. More recent investigations by Zhang et al. (2021) and Obschonka et al. (2023) further suggest that successful entrepreneurs often exhibit distinctive personality profiles characterized by high self-awareness, resilience, cognitive flexibility, and a proclivity for calculated risk-taking-traits that are instrumental in navigating entrepreneurial uncertainty and sustaining long-term business efforts.

These findings align with earlier conclusions by Ciavarella et al. (2004), who posited that entrepreneurs possessing such personality configurations are more likely to persist in their ventures, even under adverse conditions. Similarly, Rauch and Frese (2020) emphasize the critical roles of trait resilience and self-efficacy in fostering entrepreneurial persistence, particularly in the face of setbacks. In contrast, individuals lacking these psychological resources may demonstrate a lower threshold for coping with entrepreneurial challenges and are consequently more prone to early disengagement.

The Big Five model, initially advanced by Goldberg (1993), offers a robust taxonomy of personality that includes conscientiousness, extraversion, agreeableness, neuroticism, and openness to experience. These dimensions have been widely adopted in entrepreneurship research due to their stability and predictive validity. Recent studies by Liñán et al. (2022) reaffirm the model's utility, highlighting openness and conscientiousness as particularly salient predictors of entrepreneurial intention, especially among youth and emerging adult populations in developing economies.

In summary, this body of research highlights the importance of personality traits in entrepreneurial success, emphasizing the link between individual characteristics and performance in the business world. This understanding can be valuable for individuals aspiring to entrepreneurship, helping them better understand their own strengths and weaknesses and develop the necessary skills to succeed in this competitive field.

1.2. Entrepreneurial Vigilance

Entrepreneurial vigilance, as originally theorized by Kirzner (2012), encapsulates an individual's heightened capacity to detect opportunities that remain obscure to others. This construct highlights a fundamental entrepreneurial competency namely, a perceptual acuity that allows individuals to identify and act upon market inefficiencies. According to Kirzner, such alertness is central to the entrepreneurial process, as it motivates purposeful action toward value creation through opportunity exploitation.

In subsequent theoretical developments, entrepreneurial vigilance has been reconceptualized as a dual-faceted construct encompassing both the ability to discern latent opportunities more accurately than other market actors and the willingness to embrace strategic assumptions about future trends (Kuckertz et al., 2020; Jafari-Sadeghi et al., 2021). This expanded perspective positions vigilance not simply as awareness, but as a dynamic cognitive and behavioral disposition that enables entrepreneurs to navigate uncertainty with confidence and foresight.

Miao (2020) advances a psychological interpretation of this concept, viewing entrepreneurial vigilance as a cognitive schema that conditions how entrepreneurs attend to, process, and interpret environmental stimuli relevant to their venture activities. Within this framework, vigilance operates as a mental model influencing not only the detection of opportunities but also the interpretive judgments and strategic decisions that follow. Empirical research by Li et al. (2022) and Obschonka et al. (2023) supports this cognitive orientation, suggesting that both psychological preparedness and cognitive alertness are pivotal to successful opportunity recognition.

The literature increasingly converges on the critical role of entrepreneurial vigilance in shaping opportunity recognition. Empirical investigations across diverse contexts affirm that entrepreneurs who exhibit higher levels of vigilance are more adept at identifying and mobilizing resources around emergent opportunities. Mahmoud and Alizadeh, for instance, demonstrated that individual attributes such as foundational knowledge, cognitive inference, and social connectivity significantly influence entrepreneurs'opportunity recognition capacities. Moreover, Ahmad et al. (2022) provide evidence that entrepreneurial vigilance, when leveraged alongside dynamic capabilities, contributes to enhanced venture performance and competitive advantage.

Contextual studies add further granularity to these findings. In a Malaysian context, Norria and Zakaria (2016) found that entrepreneurial vigilance and creativity jointly predicted opportunity recognition, while the role of social networks was found to be statistically insignificant. Interestingly, prior knowledge did not moderate the relationships among social capital, vigilance, creativity, and opportunity identification. These results were mirrored by Moghavvemi et al. (2023), who highlighted the diminished impact of social capital as a moderator in emerging market environments, thereby reinforcing the salience of cognitive variables in such contexts.

Experimental research among student populations also underscores the developmental importance of entrepreneurial vigilance. Wang and Liu (2015) revealed that student

entrepreneurs consistently demonstrated higher levels of vigilance than their non-entrepreneurial peers, which translated into superior opportunity recognition capabilities. These findings were further corroborated by Zhang and Chen (2023), who emphasized the role of entrepreneurial education in fostering both cognitive alertness and entrepreneurial intention, underscoring education as a key enabler of vigilance development.

1.3. Sustainable Entrepreneurial Intention

Sustainable entrepreneurial intention (SEI) has increasingly gained scholarly attention as a precursor to sustainability-driven entrepreneurial action. Anchored in the Theory of Planned Behavior (TPB), Sustainable entrepreneurial intention is defined as an individual's deliberate commitment to engage in entrepreneurial activities aimed at addressing environmental and social challenges (Ajzen, 2020). The Theory of Planned Behavior posits that such intentionality is shaped by three interrelated cognitive antecedents: attitude toward sustainable entrepreneurship (AT), subjective norms (SN), and perceived behavioral control (PBC). Specifically, attitude reflects the extent to which an individual evaluates sustainable entrepreneurship favorably; subjective norms capture the perceived expectations of significant others; and perceived behavioral control denotes the individual's perceived competence to perform the behavior in question.

While attitudes and social pressures establish motivational grounds, perceived behavioral control is often identified as the most immediate predictor of behavioral enactment, given its strong association with self-efficacy and resource accessibility (Ajzen, 2020). Importantly, TPB conceptualizes behavioral intention as a dynamic construct, responsive to contextual feedback, personal experiences, and updated beliefs. Shifts in attitudes, norms, or control perceptions, driven by new information or situational changes, can realign entrepreneurial intentions over time.

Contemporary scholarship has extended the Theory of Planned Behavior framework by integrating institutional and environmental variables that facilitate or constrain the actualization of Sustainable entrepreneurial intention. For instance, Yi (2021) highlights the significant role of university ecosystems and institutional support, such as sustainability curricula, access to green incubators, financial incentives, and mentorship, in enhancing the translation of sustainable intentions into entrepreneurial behavior. These supportive structures not only fortify individuals'perceived control but also reinforce normative beliefs in favor of sustainability-oriented entrepreneurship.

In parallel, emerging empirical evidence underscores the contribution of psychological, emotional, and value-based determinants to the formation of Sustainable entrepreneurial intention. Tiba et al. (2022) demonstrated that ecological values, emotional involvement, and prosocial motivations significantly influence sustainable entrepreneurial behavior. In the same vein, Sánchez-Hernández et al. (2023) argue that moral obligation and environmental consciousness are critical in maintaining entrepreneurial motivation, particularly when individuals perceive congruence between personal values and the objectives of sustainable development.

In sum, while the Theory of Planned Behavior provides a robust theoretical foundation for analyzing Sustainable entrepreneurial intention, its explanatory potential is significantly amplified when contextual and affective dimensions are incorporated. Institutional environments, personal values, and emotional engagement interact with the core Theory of Planned Behavior constructs to shape both the formation and realization of sustainable entrepreneurial behavior. Future research should further investigate these multidimensional influences across diverse socio-economic and cultural contexts, with a particular emphasis on youth and nascent entrepreneurs who are increasingly positioned as agents of sustainable transformation.

2. Outline of the Analytical Model

2.1. Our Hypotheses

This section aims to investigate the causal relationships among personality traits, entrepreneurial vigilance, and sustainable entrepreneurial intention (SEI). To this end, four research hypotheses are proposed, each grounded in existing empirical findings and theoretical considerations.

The relationship between personality traits and entrepreneurial intention has been widely examined in the entrepreneurship literature, particularly within the framework of traditional entrepreneurial intention. Numerous empirical studies underscore the predictive value of personality traits in shaping entrepreneurial aspirations. For instance, Wang et al. (2016) highlighted the moderating role of self-confidence in the relationship between personality traits and entrepreneurial intention, noting that openness and neuroticism exert direct effects on entrepreneurial intention among agricultural students. Similarly, Dehkordi et al. (2012) explored the joint influence of personality traits and emotional intelligence, concluding that traits such as the need for achievement play a pivotal role in fostering entrepreneurial intention.

Fan and Wang (2004), through a survey of university students, identified extraversion and conscientiousness as significant predictors of entrepreneurial inclination.

Taken together, these studies affirm the robust and consistent association between personality dimensions and entrepreneurial intention, despite variations in theoretical models and measurement tools. Building on this foundation, the present study extends the analysis from traditional entrepreneurial intention to its sustainable counterpart, with a specific focus on how personality traits influence SEI. This conceptual shift reflects the growing need to understand entrepreneurial behavior in the context of ecological and social sustainability. Accordingly, the following hypotheses are formulated to examine the proposed relationships:

- ***H1a. Extraversion has a significantly positive effect on sustainable entrepreneurial intention.***
- ***H1b. Agreeableness has a significantly positive effect on sustainable entrepreneurial intention.***
- ***H1c. Neuroticism has a significantly negative effect on sustainable entrepreneurial intention.***
- ***H1d. Openness to experience has a significant and positive effect on sustainable entrepreneurial intention.***
- ***H1e. Conscientiousness has a significant and positive effect on sustainable entrepreneurial intention.***

Previous research has highlighted the influence of personality traits on entrepreneurial cognition and opportunity recognition. Hisrich (2009) posited that individuals are continuously shaped by external stimuli, which not only contribute to the development of original ideas but also enhance their ability to disregard irrelevant information. This selective attention facilitates heightened entrepreneurial vigilance, enabling individuals to efficiently detect and assess promising opportunities within dynamic environments.

Building on this cognitive perspective, Graham and Lachman (2014) emphasized the role of specific personality dimensions in shaping opportunity recognition processes. They argued that individuals with high levels of neuroticism are more prone to anxiety, which may impair their decision-making and inferential accuracy. Conversely, individuals with high openness to experience tend to exhibit greater cognitive flexibility and intellectual curiosity traits that enhance their reasoning and judgment capabilities.

The intrinsic value of an opportunity, along with its perceived potential for future development, further influences how individuals evaluate its relevance and viability. This evaluative process

is closely intertwined with personality factors, risk attitudes, and perceptual sensitivity. In this context, Huang (2016) empirically demonstrated that personality traits significantly predict entrepreneurial vigilance, which in turn facilitates opportunity recognition.

Synthesizing these findings, it becomes evident that individual personality traits play a critical role in shaping one's ability to detect opportunities that may be overlooked by others. This capacity, referred to as entrepreneurial vigilance, is thus influenced by both cognitive and dispositional characteristics. Accordingly, the following hypotheses are proposed:

- ***H2a. Extraversion has a significant and positive effect on entrepreneurial vigilance.***
- ***H2b. Agreeableness has a significant and positive effect on entrepreneurial vigilance.***
- ***H2c. Neuroticism has a significant and negative effect on entrepreneurial vigilance.***
- ***H2d. Openness to experience has a significant and positive effect on entrepreneurial vigilance.***
- ***H2e. Conscientiousness has a significant and positive effect on entrepreneurial vigilance.***

Entrepreneurial vigilance is defined as an individual's cognitive capacity to detect, interpret, and anticipate emerging entrepreneurial opportunities, influenced by their mental schemas and interpretations of socio-economic dynamics. This construct highlights the necessity of sustained alertness to subtle environmental cues, shifts in market conditions, and early-stage trends across economic and social domains.

Seminal research by Kaish and Gilad (1991) established a significant positive correlation between entrepreneurial vigilance and entrepreneurial intention. Their study demonstrated that individuals with heightened vigilance engage more actively in structured information gathering and environmental scanning, allowing them to perceive opportunities that may remain invisible to others. Such individuals are typically characterized by a proactive mindset and an elevated responsiveness to variations in consumer demand, technological innovation, and market competition. Extending this line of inquiry, Lim et al. (2017) examined the mediating role of entrepreneurial vigilance within the framework linking intention and behavior. Their empirical findings substantiated the proposition that entrepreneurial vigilance is a critical driver in the formation of entrepreneurial intention, thereby affirming its central role in shaping entrepreneurial judgment and behavioral commitment.

Collectively, these findings underscore the strategic relevance of entrepreneurial vigilance as a key cognitive mechanism facilitating the identification, evaluation, and exploitation of business opportunities. Maintaining heightened awareness of environmental developments enhances the probability of entrepreneurial engagement. On this basis, the following hypothesis is proposed:

H3. Entrepreneurial vigilance has a significant impact on entrepreneurial intention.

Moreover, personality traits have been shown to significantly shape an individual's capacity to discern entrepreneurial opportunities that may elude others, thereby influencing levels of entrepreneurial vigilance (Huang, 2016). These traits determine how entrepreneurs interpret, select, and assess potential opportunities within dynamic environments (Yan et al., 2018). Entrepreneurial vigilance, in turn, plays a direct role in fostering entrepreneurial intention, as it facilitates the early recognition of opportunities and distinguishes individuals who are more inclined to initiate entrepreneurial endeavors (Lu & Wang, 2018). Accordingly, personality traits exert an indirect effect on entrepreneurial intention through their influence on vigilance. Based on this conceptual linkage, the following hypothesis is proposed:

•H4. Entrepreneurial vigilance plays a mediating role in the relationship between personality traits and sustainable entrepreneurial intention:

•H4a. Entrepreneurial vigilance plays a mediating role in the relationship between extraversion and entrepreneurial intention.

•H4b. Entrepreneurial vigilance plays a mediating role in the relationship between agreeableness and entrepreneurial intention.

•H4c. Entrepreneurial vigilance plays a mediating role in the relationship between conscientiousness and entrepreneurial intention.

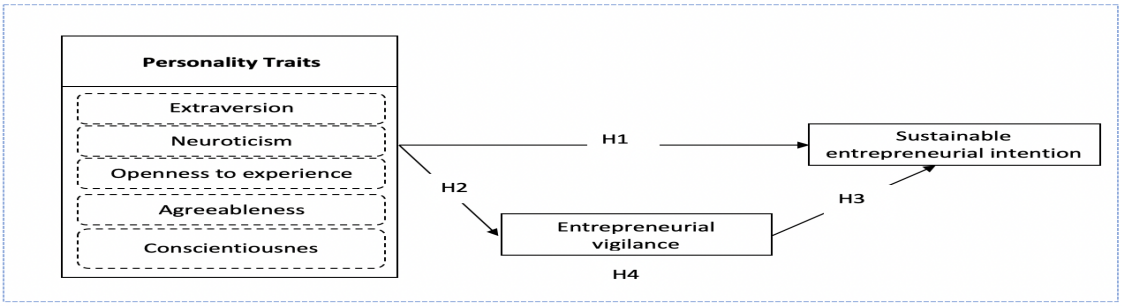
•H4d. Entrepreneurial vigilance plays a mediating role in the relationship between neuroticism and entrepreneurial intention.

•H4e. Entrepreneurial vigilance plays a mediating role in the relationship between openness to experience and entrepreneurial intention.

2.2. Conceptual Model Presentation

To explain our argument, we will present the conceptual model that illustrates the relationship between personality traits, entrepreneurial vigilance, and sustainable entrepreneurial intention:

Figure N°1 : Conceptual Model of the Research



Source : Developed from the literature review

3. Research Methodology

3.1. Epistemological Position

Our methodological approach is closely aligned with the problem we seek to address. To empirically test the relevance of our conceptual model and the hypotheses that arise from it, we have adopted a positivist epistemological perspective. In this regard, we favored a hypothetical-deductive reasoning mode and a quantitative approach.

To implement this approach, we used the method of structural equations, particularly the PLS 4 approach. This method provides us the opportunity to rigorously test the hypotheses formulated in our model, analyzing the relationships between different variables in a systematic and robust manner.

For data collection, we conducted an empirical survey with a sample of 162 students. This approach allowed us to obtain direct and specific information about the variables under study, ensuring the strength of our analyses and the reliability of our results. Indeed, by collecting data directly from the individuals concerned, we ensure that our results accurately reflect the reality on the ground and are therefore relevant for addressing our research problem.

3.2. Operationalization of Constructs

To empirically test our conceptual model, it is essential to operationalize the relationships between the different variables in the model. Operationalization involves translating each abstract concept into measurable indicators that faithfully reflect the meaning of the variable.

In this process, the researcher generally faces two distinct approaches. The first option is to develop their own measurement scales by creating specific questions or items that capture the relevant aspects of each variable. This approach offers flexibility and allows for adaptation to the specific needs of the study.

The second option, which we chose for this research, is to use already validated measurement scales that have been used in previous empirical studies. This involves adopting measurement instruments that have proven effective in other contexts and have been validated by prior research. In our case, we took care to confirm the validity of these scales during our preliminary tests of the questionnaire.

By choosing this approach, we rely on the prior validation work conducted by other researchers, which allows us to save time and ensure the reliability of the measures used in our study.

To measure personality traits, researchers and practitioners widely use the NEO Five-Factor Inventory (FFI) with 60 items to explore the nuances of the five major personality traits. Developed by Costa and McCrae in 1992, this instrument includes 12 items for each trait.

However, for our study, we chose to use a more concise version of the NEO-FFI, consisting of 30 items. This version, proposed by Digman in 1990 and refined by Goldberg in 1992, still retains six facets for each trait. Previous research has supported the effectiveness of this condensed version in terms of psychometric properties, despite its brevity, offering a practical and reliable solution to assess the fundamental aspects of personality (Körner et al., 2015).

To assess the concept of entrepreneurial vigilance, this research used a 13-item measure developed by Tang et al. (2012). This scale has been carefully adapted to align with the specific objectives of the study. All assessments used in this study were performed using a seven-point Likert scale, where participants could express their level of agreement on a scale ranging from « strongly disagree » to « strongly agree ». This methodology allows for a nuanced exploration of participants'perceptions, thus offering an in-depth understanding of entrepreneurial vigilance in the studied context.

To measure sustainable entrepreneurial intention, a crucial concept in sustainability-driven entrepreneurship, we use the measurement scales developed by Brenner (1991). This researcher developed a series of five measurement indicators to capture the complexity and depth of this intention. These indicators reflect a comprehensive understanding of the essential elements underpinning entrepreneurial commitment toward sustainability.

4. Results

4.1. Evaluation of the Measurement Model:

The measurement model delineates the presumed linear associations between latent and manifest variables. To evaluate the measurement model, existing literature suggests using three criteria to assess its quality:

4.1.1. Reliability of the Measurement Model

Using the Smart PLS software, the reliability of items is evaluated through the « loadings » or simple correlations of the measurement indicators while ensuring their alignment with their respective theoretical constructs. Following the guidelines defined by Chin (1998), standardized loadings should exceed 0.707, which indicates that a slightly higher proportion of variance is shared between the construct and its items compared to error variance (Carmines & Zeller, 1979). In practice, if the estimated model produces loadings below 0.707, we consider eliminating specific items, especially when using new items or scales developed.

Table No. 1: Results of the Reliability Analysis of the Measurement Model

Variables	Items	Loading	Cronbach's Alpha
Extraversion	Extra 3	**0.772**	**0.836**
	Extra 4	**0.791**	
	Extra 5	**0.844**	
	Extra 6	**0.857**	
Agreeableness	Agrea 1	**0.847**	**0.906**
	Agrea 2	**0.853**	
	Agrea 3	**0.896**	
	Agrea 4	**0.839**	
	Agrea 5	**0.824**	
Neuroticism	Neuro 1	**0.815**	**0.868**
	Neuro 4	**0.851**	
	Neuro 5	**0.831**	
	Neuro 6	**0.890**	
Openness to experience	Open 2	**0.746**	**0.854**
	Open 3	**0.815**	
	Open 4	**0.882**	
	Open 5	**0.794**	
	Open 6	**0.730**	
Conscientiousness	Consc 1	**0.749**	**0.874**
	Consc 2	**0.810**	
	Consc 3	**0.810**	
	Consc 4	**0.858**	
	Consc 5	**0.845**	
Entrepreneurial vigilance	Entr-Vig 2	**0.877**	**0.918**
	Entr-Vig 3	**0.931**	
	Entr-Vig 4	**0.934**	
	Entr-Vig 5	**0.843**	
Sustainable entrepreneurial intention	Sus-Ent-Int 1	**0.727**	**0.844**
	Sus-Ent-Int 2	**0.776**	
	Sus-Ent-Int 3	**0.836**	
	Sus-Ent-Int 4	**0.820**	
	Sus-Ent-Int 5	**0.759**	

Source : Our analyses

4.1.2. Construct Validity

Next, we performed an assessment of construct validity, which was divided into two levels of analysis as defined by Hair, Ringle, and Sarstedt (2012): convergent validity and discriminant validity.

- **Convergent Validity:** The assessment of convergent validity in our model begins by examining the significance of each item's contribution to the construct measurement. Convergent validity is then evaluated by calculating the average variance extracted (AVE) between a construct and its constituent items. Researchers using partial least squares (PLS) analysis generally rely on one or two measures of convergent validity, namely Cronbach's alpha and the Fornell-Larcker (1981) criterion for internal consistency. The interpretation of the obtained values is closely aligned, and thus, Nunnally's (1978) guideline recommending a threshold of 0.7 for "modest" composite reliability is often adopted, especially in the early stages of research.

The summarized results are presented in the table below.

Table N° 2: Significance and Composite Reliability (ρ) per Construct

	Composite Reliability
Agreeableness	0.908
Conscientiousness	0.882
Extraversion	0.851
Sustainable entrepreneurial intention	0.851
Neuroticism	0.871
Openness to experience	0.865
Entrepreneurial vigilance	0.922

Source : Our analyses

- **Discriminant Validity:** The conventional counterpart of convergent validity is discriminant validity, which is assessed by comparing the square root of the average variance extracted (AVE) for each latent variable with the squared correlations between the latent variables. In the context of PLS analysis, the discriminant validity criterion stipulates that a construct should share more variance with its measurement indicators than with other constructs. The results of this analysis are detailed in Table 3.

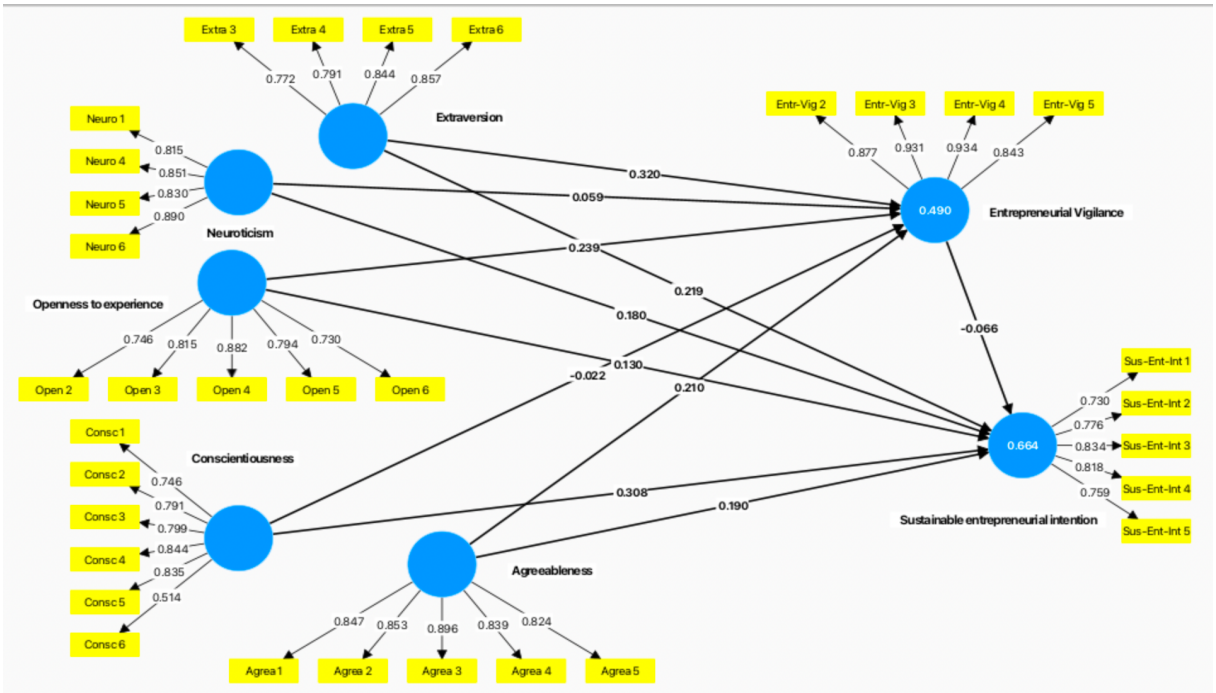
Table N°3 : Discriminant Validity Measured by the Square Root of the Average Variance Extracted (AVE)

	Agreeableness	Conscientiousness	Extraversion	Sustainable entrepreneurial intention	Neuroticism	Openness to experience	Entrepreneurial vigilance
Agreeableness	**0.852**						
Conscientiousness	0.503	**0.815**					
Extraversion	0.654	0.567	**0.817**				
Sustainable entrepreneurial intention	0.642	0.659	0.708	**0.784**			
Neuroticism	0.610	0.545	0.801	0.691	**0.847**		
Openness to experience	0.584	0.639	0.611	0.648	0.606	**0.796**	
Entrepreneurial vigilance	0.583	0.457	0.640	0.509	0.585	0.579	**0.897**

Source : Our analyses

In light of the results in the table, we observe that the square roots of the average variance extracted (AVE) for each construct are higher than the correlations between the different constructs outside of the diagonal. This observation suggests that the elements within a construct contribute significantly to that specific construct but have less impact on other constructs in the model. Therefore, we conclude that the conditions required to ensure discriminant validity for all constructs in our research model are met.

Figure N° 2: Research Model After Adjustment



Source : Our analyses

4.2. Evaluation of the Structural Model

- **The coefficient of determination (R^2)**

In analyzing our data, the first element that catches our attention is the R^2 coefficient. This coefficient plays a crucial role in understanding the relationship between our dependent variables and the explanatory variables included in our models. By providing a measure of the proportion of variance in the dependent variable explained by the independent variables, R^2 allows us to assess the adequacy of our regression models.

Table N°4 : Coefficient of Determination (R^2)

	R-square	R-square adjusted
Sustainable entrepreneurial intention	0.653	0.630
Entrepreneurial vigilance	0.489	0.461

Source : Our analyses

- **Global Model Quality Assessment:**

The results presented in Table 5 indicate that the Goodness-of-Fit (GOF) index exceeds the recommended threshold in the literature, set at 30% (Tenenhaus et al., 2005). This suggests both strong links between the measurement constructs and latent variables, as well as solid structural relationships within the model.

Table N° 5 : Global Model Quality Assessment

	AVE	R Square
Agreeableness	**0.852**	-
Conscientiousness	**0.815**	-
Extraversion	**0.817**	-
Sustainable entrepreneurial intention	**0.784**	**0,63**
Neuroticism	**0.847**	-
Openness to experience	**0.796**	-
Entrepreneurial vigilance	**0.897**	**0,461**
Average	**0.8297**	***0,5455***
Gof	***0,6727***	

Source : Our analyses

4.3. Examination of Results for Hypotheses of Isolated Links

The structural model, also known as the internal model, defines the relationships between latent explanatory variables and latent explained variables. A key objective of this study is to determine a causal order within the relationships between the various constructs. The model examined was internally evaluated using the path weighting scheme described by Lohmöller (1989). To test the hypotheses of our research model, the first step was to evaluate the significance level of the estimation parameters (path coefficients) representing the relationships between the latent variables. Following Chin's (1998) recommendations, the bootstrap resampling technique was used with a sample size of 500, using SmartPLS software.

4.3.1. Testing of Direct Hypotheses

H1a: Extraversion has a significant and positive effect on sustainable entrepreneurial intention.

The analysis of the hypothesis gives us a positive and significant standard Beta value at the 0.05 threshold, indicating that the « *extraversion* » variable has a positive impact on the « *sustainable entrepreneurial intention* » variable. The standard beta value is 0.623 (β = 0.623). This means

that an increase in « *extraversion* » by one unit leads to a 62.3% increase in sustainable entrepreneurial intention, confirming our first sub-hypothesis that extraversion positively influences sustainable entrepreneurial intention. In conclusion, hypothesis (H1a) is therefore validated.

Table N° 6: Analysis of the direct link between « extraversion » will have a positive influence on « sustainable entrepreneurial intention »

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H1a	Extraversion → Sustainable Entrepreneurial Intention	0.623	0.138	4.509	0.000	Confirmed*

* The value is significant at the 0.05 level

Source: Our analyses

H1b: Agreeableness has a significant and positive effect on sustainable entrepreneurial intention.

The analysis of the hypothesis gives us a negative and significant standard Beta value at the 0.05 threshold, meaning that the « *agreeableness* » variable has a negative impact on the « *sustainable entrepreneurial intention* » variable. The standard beta value is 0.498 (β = 0.498). This means that an increase in agreeableness by one unit leads to a 49.8% increase in sustainable entrepreneurial intention, confirming our second sub-hypothesis that agreeableness positively influences sustainable entrepreneurial intention.

In conclusion, hypothesis (H1b) is therefore validated.

Table N° 7: Analysis of the direct link between « agreeableness » will have a positive influence on « sustainable entrepreneurial intention »

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H1b	Agreeableness → Sustainable Entrepreneurial Intention	0.498	0.167	2.989	0.003	Confirmed*

* The value is significant at the 0.05 level

Source: Our analyses

H1c: Neuroticism has a significant and negative effect on sustainable entrepreneurial intention.

The analysis of the hypothesis gives us a negative and significant standard Beta value at the 0.05 threshold, meaning that the « *neuroticism* » variable has a negative impact on the « s*ustainable entrepreneurial intention* » variable. The standard beta value is -0.783 (β = -0.783). This means that an increase in « *neuroticism* » by one unit leads to a 78.3% decrease in sustainable entrepreneurial intention, confirming our hypothesis that neuroticism negatively influences sustainable entrepreneurial intention.

In conclusion, hypothesis (H1c) is therefore confirmed.

Table N°8: Analysis of the direct link between « neuroticism » will have a positive influence on « sustainable entrepreneurial intention »

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H1c	Neuroticism → Sustainable Entrepreneurial Intention	-0.783	0.037	20.986	0.000	Confirmed *

* The value is significant at the 0.05 level

Source : Our analyses

H1d: Openness to experience has a significant and positive effect on sustainable entrepreneurial intention

The analysis of the hypothesis gives us a positive and significant standard Beta value at the 0.05 threshold, meaning that the « *openness to experience* » variable has a positive impact on the « *sustainable entrepreneurial intention* » variable. The standard beta value is 0.225 (β = 0.225). This means that an increase in « *openness to experience* » by one unit leads to a 22.5% increase in sustainable entrepreneurial intention, confirming our hypothesis that openness to experience positively influences sustainable entrepreneurial intention.

In conclusion, hypothesis (H1d) is therefore validated.

Table N° 9: Analysis of the direct link between « openness to experience » will have a positive influence on « Sustainable entrepreneurial intention »

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H1d	Openness to Experience →Sustainable Entrepreneurial Intention	0.255	0.257	2.447	0.014	Confirmed *

* The value is significant at the 0.05 level

Source : Our analyses

H1e: Conscientiousness has a significant and positive effect on sustainable entrepreneurial intention.

The analysis of the hypothesis gives us a positive and significant standard Beta value at the 0.05 threshold, meaning that the « *conscientiousness* » variable has a positive impact on the « *sustainable entrepreneurial intention* » variable. The standard beta value is 0.325 (β = 0.325). This means that an increase in « *conscientiousness* » by one unit leads to a 32.5% increase in sustainable entrepreneurial intention, confirming our hypothesis that conscientiousness positively influences sustainable entrepreneurial intention.

In conclusion, hypothesis (H1e) is therefore validated.

Table N°10: Analysis of the direct link between « conscientiousness » will have a positive influence on « sustainable entrepreneurial intention »

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H1e	Conscientiousness → Sustainable Sustainable Entrepreneurial Intention	0.325	0.230	2.260	0.055	Confirmed*

* The value is significant at the 0.05 level

Source : Our analyses

H2a: Extraversion has a significant and positive effect on entrepreneurial vigilance.

The analysis of the hypothesis gives us a positive and significant standard Beta value at the 0.05 threshold, meaning that the « *extraversion* » variable has a positive impact on the « *entrepreneurial vigilance* » variable. The standard beta value is 0.486 (β = 0.486). This means that an increase in « *extraversion* » by one unit leads to a 48.6% increase in entrepreneurial vigilance, confirming our hypothesis that extraversion positively influences entrepreneurial vigilance.

In conclusion, hypothesis (H2a) is therefore validated.

Table N°11: Analysis of the direct link between « extraversion » will have a positive influence on « entrepreneurial vigilance »

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H2a	Extraversion → Entrepreneurial Vigilance	0.486	0.485	2.757	0.008	Confirmed*

* La valeur est significative au seuil de 0,05

Source: Our analyses

H2b: Agreeableness has a significant and positive effect on entrepreneurial vigilance.

The analysis of the hypothesis yields a positive and significant standardized Beta value at the 0.05 threshold, indicating that the variable « *agreeableness* » has a positive impact on the variable « *entrepreneurial vigilance* ». The standardized beta value is 0.398 (β = 0.398). This means that an increase of one unit in agreeableness results in a 39.8% increase in entrepreneurial vigilance, confirming our hypothesis that agreeableness has a positive influence on entrepreneurial vigilance.

Conclusion: Hypothesis (H2b) is thus confirmed.

Table N° 12: Analysis of the direct relationship between « agreeableness » and its positive influence on « entrepreneurial vigilance ».

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H2b	Agreeableness→ Entrepreneurial Vigilance	0.398	0.400	4.138	0.000	Confirmed*

* The value is significant at the 0.05 level

Source: Our analysis

H2c: Neuroticism has a significant and negative effect on entrepreneurial vigilance.

The analysis of the hypothesis yields a positive and significant standardized Beta value at the 0.05 threshold, indicating that the variable « *neuroticism* » actually has a positive impact on the variable « *entrepreneurial vigilance* ». The standardized beta value is 0.119 (β = 0.119). This means that an increase of one unit in neuroticism leads to an 11.9% increase in entrepreneurial vigilance, which rejects our hypothesis that neuroticism has a negative influence on entrepreneurial vigilance.

Conclusion: Hypothesis (H2c) is thus rejected.

Table N° 13: Analysis of the direct relationship between « neuroticism » and its negative influence on « entrepreneurial vigilance ».

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H2c	Neuroticism → Entrepreneurial Vigilance	0.119	0.096	1.349	0.298	Rejected *

* The value is significant at the 0.05 level

Source: Our analysis

H2d: Openness to experience has a significant and positive effect on entrepreneurial vigilance.

The analysis of the hypothesis yields a positive and significant standardized Beta value at the 0.05 threshold, indicating that the variable « *openness to experience* » has a positive impact on the variable « *entrepreneurial vigilance* ». The standardized beta value is 0.259 (β = 0.259). This means that an increase of one unit in openness to experience results in a 25.9% increase in entrepreneurial vigilance, confirming our hypothesis.

Conclusion: Hypothesis (H2d) is thus confirmed.

Table N° 14 : Analysis of the direct relationship between « openness to experience » and its positive influence on « entrepreneurial vigilance ».

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H2d	Openness to experience → Entrepreneurial Vigilance	0.259	0.261	3.590	0.000	Confirmed*

* The value is significant at the 0.05 level

Source: Our analysis

H2e: Conscientiousness has a significant and negative effect on entrepreneurial vigilance.

The analysis of the hypothesis yields a positive and significant standardized Beta value at the 0.05 threshold, indicating that the variable « *conscientiousness* » actually has a positive impact on the variable « *entrepreneurial vigilance* ». The standardized beta value is 0.532 (β = 0.532). This means that an increase of one unit in conscientiousness leads to a 53.2% increase in entrepreneurial vigilance, confirming our hypothesis that conscientiousness positively influences entrepreneurial vigilance.

Conclusion: Hypothesis (H2e) is thus confirmed.

Table N° 15: Analysis of the direct relationship between « conscientiousness » and its positive influence on « entrepreneurial vigilance ».

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H1c	Conscientiousness→ Entrepreneurial Vigilance	0.532	0.528	6.833	0.000	Confirmed*

* The value is significant at the 0.05 level

Source: Our analysis

H3: Entrepreneurial vigilance has a significant and positive effect on sustainable entrepreneurial intention.

The analysis of the hypothesis yields a positive and significant standardized Beta value at the 0.05 threshold, indicating that the variable « *entrepreneurial vigilance* » has a positive impact on the variable « *sustainable entrepreneurial intention* ». The standardized beta value is 0.597 (β = 0.597). This means that an increase of one unit in entrepreneurial vigilance results in a 59.7% increase in sustainable entrepreneurial intention, confirming our hypothesis.

Conclusion: Hypothesis H3 is thus confirmed.

Table N°16: Analysis of the direct relationship between « entrepreneurial vigilance » and its positive influence on « sustainable entrepreneurial intention ».

Hypothesis	Relation	Std. Beta	Std. Error	T-Statistics	P-Values	Decision
H3	Entrepreneurial Vigilance → Sustainable Entrepreneurial Intention	0.597	0.367	2.989	0.003	Confirmed*

* The value is significant at the 0.05 level

Source : Our analysis

4.3.2. Testing the Indirect Hypothesis (Mediating Effect of Entrepreneurial Vigilance)

The following presents the results of the direct effect (Hypothesis H1) and the indirect effect (Hypothesis H4) with and without the mediation of the variable « *entrepreneurial vigilance* ». The table below summarizes the findings.

Table N°19: Testing the indirect hypothesis (mediating effect of entrepreneurial vigilance)

Hypothesis	Original Sample (O)	Standard Deviation (STDEV)	T-Statistics (|O/STDEV|)	P-Values	Decision
Entrepreneurial vigilance mediates the relationship between personality traits and sustainable entrepreneurial intention	–	–	–	–	**Full mediation**
Extraversion → Entrepreneurial vigilance → Sustainable entrepreneurial intention	0.072	0.032	2.223	0.026	Accepted

Agreeableness → Entrepreneurial vigilance → Sustainable entrepreneurial intention	0.072	0.036	2.001	0.045	Accepted
Neuroticism → Entrepreneurial vigilance → Sustainable entrepreneurial intention	0.744	0.150	4.959	0.000	Accepted
Openness to experience → Entrepreneurial vigilance → Sustainable entrepreneurial intention	0.294	0.290	2.412	0.016	Accepted
Conscientiousness → Entrepreneurial vigilance → Sustainable entrepreneurial intention	0.128	0.133	2.745	0.009	Accepted

Source : Our analysis

Based on the theory of Zhao, Lynch, and Chen (2010), we can conclude that there is full mediation.

5. Discussion

This study explores the role of entrepreneurial vigilance as a mediating factor between personality traits and sustainable entrepreneurial intention, aiming to understand the mechanisms through which sustainable entrepreneurs can be fostered. The empirical results revealed that extraversion and agreeableness positively and significantly influence sustainable entrepreneurial intention, whereas neuroticism exerts a significant negative effect. These findings echo previous studies emphasizing the importance of stable and socially attuned personalities in entrepreneurial development (Gielnik et al., 2021; Liu et al., 2023).

Students exhibiting high levels of extraversion and agreeableness demonstrate a greater capacity to assimilate external information and engage more effectively with the global entrepreneurial ecosystem. Such students tend to develop entrepreneurial ideas with more ease, as they are better at networking and opportunity recognition (Nguyen et al., 2021). In contrast, high neuroticism can hinder information processing and increase vulnerability to stress and uncertainty, ultimately weakening the drive to pursue sustainable ventures (Zhao & Du, 2020; Hattab & Askar, 2022).

While earlier work (e.g., Fan & Wang, 2020) confirmed that extraversion is linked to traditional entrepreneurial intention, and Zhao and Du (2020) reported a negative impact of neuroticism, those studies found no significant correlation between agreeableness and sustainable

entrepreneurial intention. However, our results diverge, showing a positive and significant link between agreeableness and sustainable entrepreneurial intention. This can be explained by our sample, which included students involved in sustainable entrepreneurship competitions participants more inclined toward pro-social behavior and long-term thinking. Recent studies (e.g., Feldman & Bolino, 2022; Khan et al., 2023) support the notion that agreeableness, when aligned with sustainability goals, promotes collaboration and ethical decision-making, which are essential for sustainable entrepreneurship.

These students, who submitted sustainable business proposals, displayed higher levels of altruism and emotional sensitivity qualities that orient them toward social and environmental responsibility. This aligns with findings from Ahmed et al. (2023) and Riaz et al. (2022), who observed that individuals with strong social empathy are more inclined to adopt sustainable business models. Their heightened concern for societal well-being drives the formation of sustainable entrepreneurial intentions.

Furthermore, openness to new experiences emerged as a critical trait influencing sustainable entrepreneurial intention. Students demonstrating curiosity and imagination were more likely to engage in entrepreneurial ideation and venture creation. These findings are consistent with Baumgarth & Lingenfelder (2022) and Sultana et al. (2023), who emphasize that creativity, flexibility, and cognitive exploration foster opportunity recognition and innovation key drivers of entrepreneurial behavior.

Importantly, this study also found that extraversion, openness to experience, conscientiousness, and agreeableness are positively associated with entrepreneurial vigilance, whereas neuroticism showed no significant link. Entrepreneurial vigilance is enhanced by traits that support cognitive vigilance and adaptive thinking (Mueller & Shepherd, 2021; Prabhu et al., 2024).

This vigilance contributes to students'ability to build a clearer image of the entrepreneurial process, assess their motivations, and develop positive entrepreneurial attitudes. It strengthens their confidence in the feasibility of launching a venture by enabling opportunity recognition (Linan & Chen, 2009), and enhances their perceived behavioral control. These findings resonate with Langowitz & Minniti (2007) and are corroborated by more recent work by Dabić et al. (2023), who found that vigilance is a critical determinant of entrepreneurial readiness and success.

Moreover, entrepreneurial vigilance facilitates meaningful interaction with key stakeholders, entrepreneurs, mentors, and educators, thus shaping subjective norms (Farsi et al., 2012). It

supports the internalization of entrepreneurial values and nurtures motivation aligned with sustainability principles; an insight echoed in Ali et al. (2021).

Conclusion

This study contributes to the expanding body of literature on sustainable entrepreneurship by empirically examining the mediating role of entrepreneurial vigilance in the relationship between personality traits and sustainable entrepreneurial intention. The findings highlight the importance of extraversion, agreeableness, and openness to experience in enhancing both entrepreneurial vigilance and sustainable entrepreneurial intention, while revealing the negative impact of neuroticism. These results suggest that individuals who are stable, socially oriented, and cognitively open are more likely to identify opportunities, interpret environmental signals, and form strong intentions to engage in sustainable entrepreneurial activities.

Entrepreneurial vigilance is identified as a critical cognitive mechanism that transforms personality traits into actionable entrepreneurial behavior. By fostering awareness, adaptability, and engagement with diverse stakeholders, entrepreneurial vigilance enhances individuals'ability to recognize viable opportunities and align their entrepreneurial motivations with sustainability objectives. This supports a more comprehensive understanding of how human capital, grounded in personality and cognition, can be leveraged to promote sustainable entrepreneurship.

From a practical standpoint, the findings offer valuable implications for countries and organizations with limited resources to support entrepreneurship through conventional models like accelerators or incubators. Specifically, the study suggests that entrepreneurial spirit can be nurtured from the outset by focusing on individuals'entrepreneurial intentions. University educators play a pivotal role in adapting curricula to foster the development of personality traits linked to entrepreneurship, such as conscientiousness and openness to experience.

Regarding conscientiousness, the study emphasizes its role in enhancing entrepreneurial intention. Universities could incorporate initiatives that cultivate a strong sense of responsibility and reliability, such as programs focused on project management, initiative-taking, and leadership. These programs could foster essential entrepreneurial qualities.

Similarly, openness to experience is identified as a key trait influencing entrepreneurial intention. To encourage this characteristic, universities could organize creative activities and student competitions aimed at fostering innovation and exploring new ideas. These initiatives would provide students with opportunities to develop their creativity and explore novel fields.

Additionally, the study underscores the significance of entrepreneurial vigilance in influencing entrepreneurial intentions. To cultivate this skill, universities could offer training in information gathering, data analysis, and practical exercises designed to enhance students'ability to identify opportunities in their environment.

Despite its contributions, this study has several limitations that should be acknowledged:

- **Sample Scope and Generalizability:**

The study was conducted with a relatively small sample of university students, which may limit the generalizability of the findings to broader populations, including experienced entrepreneurs or individuals outside academic settings.

- **Limited Consideration of Contextual and Cultural Factors:**

The study does not account for potential contextual influences such as cultural values, institutional support, or social norms that may moderate the relationship between personality and entrepreneurial intention. Cross-cultural or comparative studies could yield richer insights. These insights are particularly relevant for Moroccan universities, which are tasked with developing entrepreneurial initiatives, especially in countries like Morocco that face significant unemployment challenges. Further research is recommended in this area to deepen understanding. Future studies could investigate the differences between personality traits associated with entrepreneurial intention and those of individuals who have already embarked on entrepreneurial careers. Longitudinal studies within groups exposed to skill and personality development programs could also provide valuable insights.

Future research could explore several avenues. First, it would be beneficial to study business students with deep knowledge of entrepreneurship and prior entrepreneurial experiences to better understand the personality traits that differentiate those who have successfully transitioned into entrepreneurship. Second, further examination of additional personality traits such as optimism, resilience, and creativity is needed, as these may play a critical role in entrepreneurial intention. Third, replicating the study with larger, more diverse samples using probabilistic sampling techniques would help improve the generalizability of the findings. Finally, examining potential mediators, such as culture, age, social support, or self-perception, could provide a deeper understanding of the factors influencing the relationship between personality traits and entrepreneurial intentions.

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