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Impact of Personality Traits and Sustainability Orientation on Social Entrepreneurial Intentions among Engineering Graduates: A Test of the Big Five Personality Approach

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Abstract

The study intends to explore the relationship that exists between the big five personality traitsagreeableness, conscientiousness, extraversion, neuroticism, openness, and sustainability orientationand the intention of engineering students to engage in social entrepreneurship. The data were analyzed using SMART PLS software. A five-point Likert scale questionnaire was distributed to 259 samples both in-person and online. Structural equation modelling was used to examine the impact of the big five personality traits and sustainability orientation on the intention to engage in social entrepreneurship.The reliability was assessed using Cronbach Alpha and Composite Reliability (CR), the multicollinearity was assessed using the Variance Inflation Factor (VIF), and the discriminant validity was assessed using the Fornell and Larcker criterion and the Hetero Trait-Mono Trait (HTMT) ratio. The study identified that social entrepreneurship intention is positively and significantly impacted by the proxies of the big five personality traits, including openness, agreeableness, extraversion, and sustainability orientation. The research indicates that graduates from engineering whohavea strong focus on sustainability orientation, alongside their personality traits, tend to demonstrate an elevated desire and intention to set up social enterprises. The findings of the study provide policymakers valuable insights into crafting targeted incentives for graduates, aimed at fostering the growth of social enterprises.

Keywords: Engineering Graduates, Personality Traits, Social Entrepreneurial Intention, Sustainability Orientation

1. Introduction

The impact of personality traits on social entrepreneurship has become a topic of increasing discussion in the realms of business and economics literature (Pandey *et al.*,2023). Entrepreneurship for the betterment of society aspires to bring inventive solutions to societal issues and to generate social value to positively impact the quality of life for individuals (Tan *et al.*, 2021).Social entrepreneurship adheres to the principles that place a higher value on individuals than on revenue(Guzman *et al.*, 2019) and is recognized as the catalyst behind social transformation which provides distinctive, sustainable solutions to problems while preserving profits (Marti & Mair, 2009). In achieving the Sustainable Development Goals (SDGs), social entrepreneurship holds paramount importance for developing nations like India, as emphasized by Littlewood and Holt (2018).

Entrepreneurial Intention (EI) is a measure of entrepreneurial endeavour and a useful tool for recognizing and anticipating it (Krueger *et al.*,2000). The term "Social Entrepreneurial Intention" refers to an

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individual's ambition and self-assurance while starting a social enterprise (Luc, 2020). Ahmed *et al.*(2022) suggest that social entrepreneurs have distinguishing traits that make the process simpler to understand their business practices. These traits include the ability to accomplish their societal purpose,and the pursuit of opportunities to address social issues. Perceptions of feasibility and desirability are among the "enabling factors'' that impact social entrepreneurial intentions (Marti & Mair, 2009). Additional significant indicators of social entrepreneurial intention include prior experience (Hockerts, 2017) social worth, social wealth and social assessment (Baierl *et al.*, 2014; Bacq & Alt, 2018). Individual initiative (Nsereko *et al.*, 2018), pro-social motivation, social identity (Ko & Kim, 2020), moral obligation and self-efficacy (Peng & Zhang, 2021) emotional intelligence and personal background (Cohen *et al.*, 2019) are all factors that influence social entrepreneurial intention.

In accordance the past literature suggests that there are three fundamental approaches to entrepreneurship research: functional personality, and behaviour. The first approach addresses an entrepreneur's relationship with their environment, the second emphasizes the unique characteristics of entrepreneurs, and the third conceptualizes the actions of entrepreneurs (Cope, 2005). This study adopts the perspective of the personality approach. Personality traits serve as predictors of individual behaviour, elucidating variations in how individuals respond to similar situations (Llewellyn & Wilson, 2003). According to Mair and Noboa (2006), a combination of situational and individual factors determines Social Entrepreneurial Intention (SEI). Individual characteristics as a single component predict social entrepreneurs' entrepreneurial activity to engage in transformative changes and have unique personality traits that align with their ideals and entrepreneurial activities (Hossain *et al.*, 2021).

Personality traits are one of the major elements influencing an entrepreneur's success (Salamzadeh *et al.*, 2014). According to personality models, an individual's views and perspectives are considered generally and their aspirations for their business focuses specifically (Frank *et al.*, 2007) are significantly influenced by their personality traits. Some of the specific psychological traits that social entrepreneurs embrace are risk-taking, motivation, locus of controversies, inventiveness, and assertiveness (Tracey & Phillips, 2007; Brandstätter, 1997). A renowned personality structure known as the Big Five approach (Costa & McCrea,1992) provides a taxonomy of personality based on five core traits that allow most personality traits to be generalized: neuroticism, consciousness, agreeableness, extraversion, and openness.

Recognizing how sustainability orientation impacts social entrepreneurial intention, has significance in motivating a social enterprise to provide a chance to reevaluate the enterprise's goal of bringing about the desired change through the application of sustainable innovative strategy and a reevaluation of value-creating (Brown & Wyatt, 2010). Social enterprises face the challenge of balancing two seemingly conflicting objectives namely achieving their social mission and building a financially sustainable business (Picciotti, 2017). According to Hota *et al.* (2020), social enterprises must thus have a strong understanding of "sustainability" to achieve monetary longevity and future societal benefits. Sustainability orientation refers to a level of sustainability that prioritizes an enterprise's social responsibility and environmental performance(Sung & Park,2018). Social enterprise frontiers encompass the formulation of enduring business strategies (George *et al.*, 2016), advocacy for environmentally friendly innovations (Zahra *et al.*, 2014), the generation of sustainable social impact (Nguyen *et al.*, 2015), and leveraging social enterprise for the creation and dissemination of value (Sulphey & Alkahtani, 2017).

Personality traits and their influence on social entrepreneurship have been extensively studied in developed economies. Yet, this field is still relatively novel in developing economies. The increasing popularity of social entrepreneurship in recent years has contributed to the growth of this discourse (Pathak *et al.*, 2018). Unfortunately, the absence of clear legal frameworks and conceptual clarity in the national setting hinders social entrepreneurship as an economic subsector. Despite these legal and societal restrictions,

more and more entrepreneurs are penetrating the market every year (Kumar & Giri, 2020). These entrepreneurs aim to use their businesses to bring about positive societal change, set an example for future generations, and promote equality (Pandey, 2019).

In this context, this study deployed a conceptual Figure (1) encompassing factors proxied by personality traits and the sustainability orientation of the Social Entrepreneurial Intention. This study key focuses on three significant contributions. First, it adds personality traits and sustainability orientation as pertinent variables to the research on social entrepreneurial intents (Bacq & Alt, 2018; Hsu & Wang, 2018; Ip *et al.*, 2018). This study shows that these characteristics have vastly different effects on people's inclinations to start social businesses in comparison with commercial business ventures. Second, academics, investors, and policymakers can more effectively target and inspire potential social entrepreneurs by demonstrating a sustainability orientation, which is critical for the importance of creating positive environmental, social, and economic sustainability (Maseno & Wanyoike, 2022; Sunio *et al.*, 2020). Thirdly, as suggested in the study conducted by Hossain *et al.*, 2021 the literature is inconclusive on how examination graduates contribute to their motivation to engage in social entrepreneurship. It is important to consider samples for future research from engineering students to undertake a study on their potential role in Social Entrepreneurial Intention. Hence the objective of the study is to identify the impact of personality traits and sustainability orientation on social entrepreneurial intention among engineering graduates.

2. Literature Review

2.1 Social Entrepreneurial Intention and Personality Traits

Social entrepreneurship plays a vital role in developing nations where there is significant economic segregation and social exclusion (Chell, 2007). Entrepreneurial intentions and behaviours have mostly been explained by theories based on intentions like the theory of planned behaviour (Ajzen, 1991) and the entrepreneurial event model(Shapero & Sokol, 1982).To gain insight into how entrepreneurial motives and practices form, the concepts above have also been applied in the realm of social entrepreneurship (Hockerts, 2017). The relationship between behaviour, intention, and actions becomes apparent in light of the Theory of Planned Behavior (TPB) propounded by Azjen (1991). According to the theory, motives are deemed to be the most important variable impacting the degree of effort an individual is willing to put forth when attempting the behaviour they want to exhibit. In corroborating with Krueger and Brazeal (1994), entrepreneurial intention is an individual's determination to launch an enterprise shortly. Entrepreneurship is seen to be well predicted by entrepreneurial purpose (Krueger *et al.,* 2000) social entrepreneurial intention is the desire of an individual to establish a social enterprise to use creative thinking to bring about social transformation. It highlights an individual's predictive characteristics to describe various individual behaviours in the same circumstances (Llewellyn & Wilson, 2003). In corroborating with the previous research, empathetic intelligence, Prior expertise, social assistance, innovation, ethical responsibility, individual standards, self-esteem, and a sense of management of behaviour are the most important predictors of social entrepreneurial intention (Hockerts, 2017; Yang *et al.,* 2015).

An individual's "personality" is the peculiar amalgam of factors that shape their opinions, sensations, practices, and decisions. The entrepreneur's propensity to undertake risks is driven by their personality traits(Rauch & Frese, 2007). According to Cools and Broeck (2008), for instance, for an enterprise to succeed, its employees have to perform better than non-entrepreneurs on measures like internal sense of control, desire for accomplishments, proactive disposition, competence to endure apprehension, and self-esteem. Some of the unique psychological attributes that social entrepreneurs embrace include risk-taking, motivation, locus of control, inventiveness, and assertiveness (Tracey & Phillips 2007; Brandstätter, 1997). The Five-Factor Model (FFM) of personality has been extensively studied and tested(Ariani,2013). The International English Big-Five Mini-Markers developed by Thompson (2008) showed that the FFM structure is culturally invariant. The FFM consists of five

dimensions namely agreeableness, conscientiousness, extraversion, openness, and neuroticism. As the Big Five personality depicts the fundamental structure of the human character, the Big Five personality is the most often used approach to characterize personality (Chell, 2007).

2.2 Agreeableness and Social Entrepreneurial Intention

An individual's level of collaboration, passiveness, humility, reliability, compassion, generosity, and sociability is measured by their degree of agreeableness(Costa & McCrae, 1992). Highly agreeable individuals are typically trusting, kind, forgiving, and altruistic (Tran *et al.*, 2016). To build strong relationships with stakeholders, entrepreneurs must be dependable and able to work collaboratively (Shane & Cable, 2002). Individuals with this trait are more inclined to be involved in volunteering as they are preoccupied with the needs of others (Sahinidis *et al.*, 2020). Agreeableness is particularly important in the context of social entrepreneurship, where compassionate individuals prioritize social ideals over economic ones and work to address societal problems through cooperation and the development of social values and corroborate between agreeableness and social entrepreneurship intention (Yusif & Kamil, 2015, Hsu & Wang, 2018, Ip *et al.*, 2018, Hossian *et al.,* 2021, Luc,2020; Kumcu & Cetinel, 2022). In contradiction, Milanovic *et al.* (2021) found a negative relationship between agreeableness and social entrepreneurial intention.

2.3 Extraversion and Social Entrepreneurial Intention

The degree to which an individual exhibits traits such as hospitality, determination, vitality, networking, outgoingness, adventure, dominance, warmth, vibrancy, and sociability is referred to as extraversion. Extraversion is a measure of how comfortable a person is in building relationships with others (Şahin, *et al.*, 2019). Entrepreneurs who possess an extroverted personality can effortlessly establish and maintain positive relationships with stakeholders, investors, and vendors (Şahin *et al.*, 2019). Social entrepreneurs have to interact with individuals as they market their businesses to staff individuals, financiers, and patrons. The organization must possess a certain extroversion to accomplish it (Luc, 2020).Individuals need to build networks that connect them with other individuals to comprehend social needs and share their ideas with society. Furthermore, studies have demonstrated that extraversion and business intentions have a positive association, while Yusuf and Kamil (2015**)** affirm that there is no significant relationship between extraversion and social entrepreneurial intention.

2.4 Openness to Experience and Social Entrepreneurial Intention

An open-minded individualis willing to experiment with novel approaches and takes pride in diverse points from different perspectives (Ariani, 2013). According to Chang *et al.* (2014), those who have elevated openness to experience scores are probably imaginative and creative individuals. These attributes are essential for any individual offering to initiate an independent social enterprise (Rothmann & Coetzer, 2003). They generally tolerate change and innovation well, are willing to embrace opportunity and risk, and have a high threshold for ambiguity(Ahmed *et al.*, 2022).To start new businesses, social entrepreneurs ought to be inventive, imaginative, and unconventional (Udayanganie *et al.,* 2019; Hsu & Wang, 2018; Liu *et al.*, 2020; Luc, 2020)affirms the significant influence of openness on several dimensions of Social Entrepreneurial Intention. In contrast, the studies conducted by Milanovic *et al.* (2021) and Ip *et al.* (2018) found an inverse relationship between openness and social entrepreneurial intention.This relationship is tested through the formulation of hypotheses.

H_1: Social entrepreneurial intention is influenced by the personality traits of agreeableness, extraversion, and openness to new experiences among engineering graduates.

2.5 Conscientiousness and Social Entrepreneurial Intention

Conscientiousness refers to an individual's self-control, hard work, tenacity, and work discipline **(**Baum & Locke, 2004). Highly conscientious people are consideredresponsible, efficient, dependable,

organized, and self-disciplined (Baum & Locke, 2004). An essential component in determining an entrepreneur's existence is their level of conscientiousness. It is considered to be the attribute that frequently forces an entrepreneur apart from a manager (Preethi & Priyadarshini, 2018). Social entrepreneurs undertake difficult projects intending to improve people's lives while ensuring financial success. To achieve this, social entrepreneurs need to be goal-oriented, driven, effective, efficient, disciplined, and responsible. The studies conducted by (Luc, 2020; Hsu & Wang, 2018) found an adverse relationship between conscientiousness and social entrepreneurial intentions. At the same time, the study by Khmu & Cetinel (2022) contradicts a significant relationship between conscientiousness and social entrepreneurial intentions.

2.6 Neuroticism and Social Entrepreneurial Intention

Neuroticism is a measure of an individual's emotional stability. Individuals with severe neuroses frequently display recklessness, diminished self-worth, fluctuating emotions, and depression considering they are oblivious of their feelings. On the contrary, emotionally stable individuals can remain calm under pressure with high levels of comfort, confidence, and self-esteem (Tran *et al.*, 2016). Starting and running a new business is often a challenging task that requires diversity and complexity. Entrepreneurs must be able to carry the mental and physical burden of challenges, failure risks, and lack of confidence. It is evident from the aforementioned traits that entrepreneurs possess high emotional stability (Luc, 2020). The results of research by Yusuf and Kamil (2015) revealed an adverse relationship between neuroticism and social entrepreneurial intention, whereas research by Milanovic *et al.* (2021) and Ip *et al.* (2018) found an upward relationship between neuroticism and social entrepreneurial intention.The relationship is tested through the formulation of hypotheses.

H_2: Social entrepreneurial intention is negatively impacted by the personality traits of conscientiousness and neuroticism among engineering graduates.

2.7 Sustainability Orientation and Social Entrepreneurial Intention

Sustainability has been viewed to be an important variable in demonstrating the existence of social enterprises (Al-Qudah *et al.*, 2022). The focus on sustainability influences business objectives, as socially responsible actions are believed to align better with a sustainability-oriented perspective. Sustainability-oriented individuals are often better positioned to identify business prospects that arise from ecological and societal problems. This is because of greater awareness and past knowledge (Kuckertz & Wagner, 2010). Businesses that place a high priority on sustainability have shifted away from the conventional emphasis on cost reduction and completing tasks on time to include consideration of the economy, environment, and society (Markard *et al.*, 2012). This approach to business attracts young minds and inspires them to become social entrepreneurs who prioritize sustainable orientation and standards (Marano *et al.*, 2017; Zheng *et al.*, 2015). Young individuals who adhere to sustainability (Choongo *et al.*, 2016) are more inclined to participate in social congregation rather than social benevolence to address deprived areas of the economy and reinstate societal equilibrium. Potential goal conflicts that may occur when integrating environmental, social, and economic objectives could be the reason for the distinction between students studying business and those studying non-business (Dickel, 2018).According to Lumpkin (2011),social enterprises are characterized by two identities: a utilitarian identity motivated by financial objectives and a normative identity motivated by social perspectives and individual orientation. A shared objective could be pursued by both identities in their pursuit of business objectives and sustainability-oriented thinking. Thus, a strong sustainability orientation with commercial goals strengthens the effect of entrepreneurial attitudes on social entrepreneurial intentions. The findings are in line with those of other studies conducted by Jain *et al.* (2019), and (Sahinidis *et al* 2020), where sustainability orientation is positively significant on social entrepreneurial intention. The relationship is tested through the formulation of the hypothesis**.**

3. Research Methodology

3.1 Participants

The intended respondents for this study were engineering graduates in Coimbatore. Coimbatore is a Tier II city in Tamil Nadu and is known for being one of the most industrialized cities, often referred to as the Manchester of South India. The research methodology used for this study was quantitative and aimed to assess the influence of personality factors and sustainability orientation on the social entrepreneurial intentions of engineering graduates.

3.2 Data Collection and Sample Selection

A structured questionnaire was proposed with the two sections. The obligatory demographic data are included in the first section. The second section solicits queries regarding personality traits, sustainability orientation, and social entrepreneurial intention using a 5-point Likert scale (with 1 indicating strongly disagree and 5 indicating strongly agree). Primary data was collected by distributing questionnaires both offline and online using Google Forms to 259 engineering graduates who expressed their interest in entrepreneurial intention by purposive sampling. The data was collected from August 2023 to September 2023. The data was analyzed using SPSS and SMART-PLS 4.

3.3 Measurement of Constructs

Using Structural Equation Modelling (SEM) in the Smart PLS software, construct reliability and validity were investigated and confirmed. To assess the internal consistency reliability, Cronbach's alpha and composite reliability were computed. The Average Variance Extracted (AVE) was determined to verify convergent validity. To assess discriminant validity, the Fornell-Larcker criterion and HTMT ratio were estimated. To determine the multicollinearity in the data, the Variation Inflation Factor (VIF) was calculated. Bootstrapping was employed to assist with the hypothesis-testing process.

Each attitudinal disposition is scaled on a five-point Likert scale ranging from 1'strongly disagree' to 5 'strongly agree'. The big five personality traits were evaluated using the "Big Five Inventory - GSOEP" (Hahn *et al.*, 2012) three items per trait make up the entire set of 15 items that make up the GSOEP measure. The scale measured the graduate's personality traits on five dimensions: agreeableness, conscientiousness, openness, extraversion, and neuroticism. Social Entrepreneurial Intention was measured using 5 items adopted from (Yang *et al.*,2015). Sustainability orientation scales were adopted from (Kuckertz & Wagner, 2010).

4. Results and Discussions

4.1 Result and Findings

4.1.1 Demographics Profile of the Respondents

The demographic profile of the respondents is presented in Table 1.

4.1.2 Measurement Model

The outer model in PLS-SEM, also known as the measurement model, explains how concept and

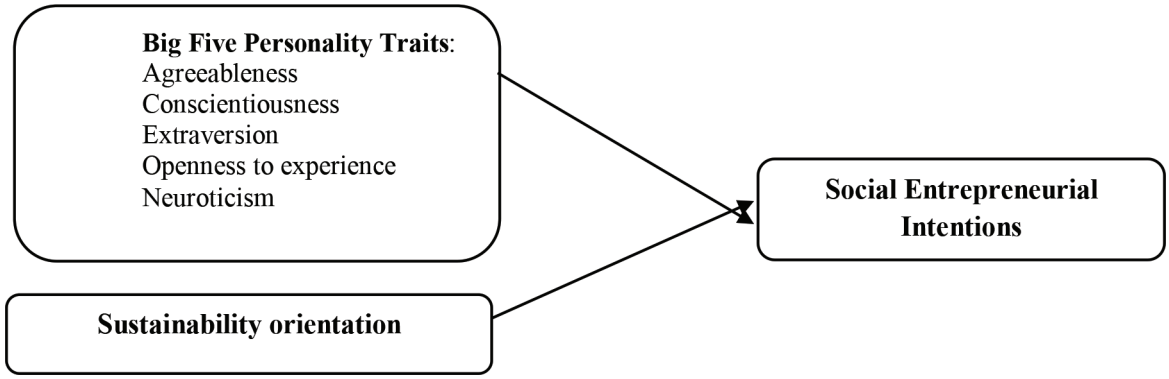

Figure 1. Conceptual framework.

indicator variables are linked, and is used to evaluate construct reliability, convergent validity, and discriminant validity (Pandey *et al.*, 2023).

4.1.3 Reliability and Convergent Validity

Data presented in Table 2reveal that all Cronbach's alpha and composite reliability values meet the minimum value of 0.7 suggested by Fornell and Larcker (1981) for all the variables. The Cronbach's alpha values for Social Entrepreneurial Intention, openness, conscientiousness, extraversion, agreeableness, neuroticism, and sustainability orientation(0.770, 0.729, 0.733, 0.704, 0.771, 0.798, and 0.862, respectively) confirm the constructs' reliability. The value of AVE (larger than 0.5) suggested by and the factor loading (larger than 0.5) confirms the convergent validity suggested by Hair (2014) corroborated the factor loadings of the Table 2 items were more than 0.5, demonstrating that the items effectively communicated the fundamental concept.

4.1.4 Discriminant Validity

The discriminant validity is tested throughthe Fornell - Larcker criterion and HeteroTrait – MonoTrait (HTMT). From Tables3 and 4, it is implied that all constructs have acceptable discriminant validity when the values are below the cutoff of 0.85(Kline, 2011).

Table 3 shows the correlational values of all variables with the value in the diagonal as the square roots of AVE (the numbers highlighted are the square roots of AVE of agreeableness(0.827), conscientiousness(0.774),extraversion(0.793),neuroticism(0.807),openness(0.805),SEI(0.722) and sustainability orientation(0.803). To ensure discriminant validity according to Fornell and Larcker(1981), the square root of Average Variance Extracted (AVE) must be greater than the correlation estimations of its corresponding constructs. Additionally, there is no issue of multicollinearity as all correlation values are less than 0.85. The squared correlation between any two latent constructs should not exceed the AVE of each latent construct(Hair *et al.,* 2016).

In Table 4 the Hetero Trait-Mono Trait (HTMT) ratio, is a reliable method of assessing discriminant validity. The HTMT ratio is calculated by dividing the mean of average correlations for items that measure distinct constructs by the mean of average correlations for items measuring the same construct (Hair, 2014). All the values in HTMT ratios are below 0.85, which is

Table 1. Demographic Profile of the Respondents

Demographic characteristic		Frequency(N=259)	(%)
Age(in years)	Below 20	38	15
	20-22	79	31
	22-25	142	54
Gender	Male	143	55
	Female	116	45
Educational Qualification	Graduate	152	59
	Post Graduate	107	41

Source: Computed Data

Table2. Reliability and convergent validity

Variables	Items	Loadings	Cronbach's Alpha	C.R (rho_a)	C.R (rho_c)	AVE
Social Entrepreneurial Intention	SEI 1	0.731	0.770	0.774	0.845	0.522
	SEI 2	0.726				
	SEI 3	0.779				
	SEI 4	0.660				
	SEI 5	0.711				
Openness (O)	O1	0.783	0.729	0.733	0.846	0.647
	O2	0.838				
	O3	0.792				
Conscientiousness (C)	C1	0.824	0.733	0.740	0.810	0.599
	C2	0.914				
	C3	0.531				
Extraversion (E)	E1	0.729	0.704	0.715	0.835	0.629
	E2	0.800				
	E3	0.846				
Agreeableness (A)	A1	0.815	0.771	0.778	0.867	0.685
	A2	0.844				
	A3	0.824				
Neuroticism (N)	N1	0.643	0.729	0.838	0.846	0.651
	N2	0.821				
	N3	0.930				
Sustainability Orientation (SO)	SO1	0.814	0.868	0.866	0.901	0.645
	SO2	0.813				
	SO3	0.837				
	SO4	0.819				
	SO5	0.730				

Source: Computed Data
Note: A-Agreeableness, C- Conscientiousness, E-Extraversion,N- Neuroticism, O-Openness, SEI- Social Entrepreneurial Intention, SO- Sustainability Orientation

well within the recommended range by Kline (2011). Discriminant validity is therefore proven.

In Table 5 VIF was used to analyze collinearity. The value of VIF should be less than 3.3 and if the value of VIF is more than 3.3, then multicollinearity exists as suggested by Diamantopoulos and Riefler (2008) Data presented in Table 5 shows the VIF values for each of the variance less than 3.3. Thus, multicollinearity does not exist.

After confirming the validity and reliability of the construct, the study proceeded to evaluate the structural model. The first step in this process was to identify and address any collinearity issues in the models. Once these issues were resolved, the importance and relevance of the structural model relationship were assessed.

Table 6 results indicate that social entrepreneurial intention is positively impacted by agreeableness (β = 0.257, t = 4.821), extraversion (β = 0.247, t = 4.964), openness (β = 0.165, t = 3.097), and sustainability orientation (β = 0.468, t = 6.903). On the other hand, the impact of Neuroticism (β = 0.039, t = 0.833) and Conscientiousness (β = 0.014, t = 0.283) on social entrepreneurial intention is not supported.

The value of R-square which is 0.638 indicates that 63.8% of the total variation in Social Entrepreneurial Intention is explained by agreeableness, conscientiousness, extraversion, neuroticism, and sustainability orientation.

The study calculated the effect size (f^2) to evaluate the importance of each path using Sullivan and Feinn's method (2012). The effect sizes were divided into three categories, namely large (0.35), medium (0.15), and small (0.02), following Cohen's guidelines (1988). The results indicate that the sustainability approach (f^2= 0.480) has a significant impact on social entrepreneurial intention. Openness (f^2 = 0.053) has a minor effect on social entrepreneurial intention, while agreeableness (f^2= 0.159) and extraversion (f^2= 0.119) have a moderate effect. Meanwhile, neuroticism (f^2 = 0.004)

Table 3. Fornell-Larcker criterion

	A	C	E	N	O	SEI	SO
A	0.827						
C	0.139	0.774					
E	0.143	0.047	0.793				
N	-0.057	0.176	-0.052	0.807			
O	0.067	0.058	0.503	0.107	0.805		
SEI	0.458	0.145	0.511	0.033	0.444	0.722	
SO	0.330	0.143	0.311	0.003	0.283	0.679	0.803

Source:ComputedData
Note: A-Agreeableness, C- Conscientiousness, E-Extraversion,N-Neuroticism, O-Openness, SEI- Social Entrepreneurial Intention, SO- Sustainability Orientation

Table 4. Hetero trait mono trait ratios

	A	C	E	N	O	SEI	SO	Was the HTMT less than 0.85?
A								
C	0.221							Yes
E	0.184	0.081						Yes
N	0.077	0.221	0.097					Yes
O	0.102	0.086	0.695	0.114				Yes
SEI	0.594	0.173	0.689	0.079	0.586			Yes
SO	0.408	0.166	0.388	0.045	0.356	0.826		Yes

Source: Computed Data
Note: A-Agreeableness, C- Conscientiousness, E-Extraversion,N- Neuroticism, O-Openness, SEI- Social Entrepreneurial Intention, SO- Sustainability Orientation

Table 5. Test of multicollinearity

Variance	VIF
A→SEI	1.145
C→SEI	1.067
E→SEI	1.422
N→SEI	1.066
O→SEI	1.407
SO→SEI	1.264

Source: Computed Data

Table 6. Structural equation model: Results

Hypothesis	Std. beta	Std. error	t-value	p-value	R2	F2	Q2
A→SEI	0.257	0.053	4.821	0.000	0.638	0.159	0.313
C→SEI	0.014	0.049	0.283	0.777		0.001	
E→SEI	0.247	0.050	4.964	0.000		0.119	
N→SEI	0.039	0.047	0.833	0.405		0.004	
O→SEI	0.165	0.053	3.097	0.002		0.053	
SO→SEI	0.468	0.068	6.903	0.000		0.480	

Source: Computed Data
Note: A-Agreeableness, C- Conscientiousness, E-Extraversion,N- Neuroticism, O-Openness, SEI- Social Entrepreneurial Intention, SO- Sustainability Orientation

and conscientiousness (f^2 = 0.001) have negligible effect sizes on the R^2 of social entrepreneurial intention.

The blindfolding technique is then used to evaluate the model's predictive relevance (Q^2), indicating that the model has predictive ability. The values of Q^2 for the endogenous variables can be identified to be greater than zero (Hair, 2016) 0.313 for social entrepreneurial intention.

4.1.5 Hypotheses Testing

To test the validity of the hypotheses and determine the significance of the Path Coefficient, the model was evaluated using the bootstrapping approach with 5000 resamples.

H_1: Social Entrepreneurial Intention is positively impacted by agreeableness, extraversion, and openness Table 6 shows the value p-value is agreeableness (0.000), extraversion (0.000), openness (0.002) the p-value lesser than 0.05 confirms a positive relationship between extraversion, openness, on Social Entrepreneurial Intention. So, hypothesis 1 is accepted.

H2: Conscientiousness and neuroticism negatively impacted Social Entrepreneurial Intention. Table 6 shows the value p-value is conscientiousness (0.777), and neuroticism (0.405) the p-value greater than 0.05 confirms a negative relationship between conscientiousness and neuroticism on Social Entrepreneurial Intention. So, hypothesis 2 is accepted.

H_3: Sustainability orientation is positively impacted on Social Entrepreneurial Intention. Table 6 shows the value p-value is (0.000) a p-value lesser than 0.05 confirms a positive relationship between sustainability orientations on Social Entrepreneurial Intention. So, hypothesis 3 is accepted.

4.2 Discussion

The main objective of this study was to investigate the relationship between personality traits, sustainability orientation, and the intention to engage in social entrepreneurship among engineering students. Specifically, the study aimed to examine the impact of sustainability orientation, conscientiousness, extraversion, agreeableness, neuroticism, and openness on social entrepreneurial intentions. The conceptual framework of the research was used to explore the connection between social entrepreneurial ambitions and personality factors. The study analyzed the personality traits of openness, conscientiousness, extraversion, agreeableness, neuroticism, and sustainability orientation.

In the case of Agreeableness, the personality trait of agreeableness bears a significant and positive correlation with Social Entrepreneurial Intention. In essence, the study suggests that cooperative, sympathetic, kind, and forgiving behaviours are indicative of engineering students' inclination toward pursuing social entrepreneurship.

In the case of extraversion, this study identified a strong positive correlation between extraversion and social entrepreneurial intention is encouraged in engineering students who are talkative, gregarious, bold, and extrovert by nature.

Additionally, in the case of openness a strong and positive relation between openness and social entrepreneurial intention was found in the study that having positive traits such as curiosity, creativity, intellectualism, openness to new ideas, and intellectual curiosity encourages social entrepreneurial intention in engineering students.

In the case of sustainability orientation, the study found a significant and positive relation between social entrepreneurial intention and sustainability orientation which encourages engineering students to explore market opportunities and consciously create goods and services for society after refining dimensions concerning economic, social, and environmental aspects.

In the case of neuroticism, the relationship with SEI was significant and negative implying negative features such as jealousy, moodiness, upset condition, and irritation hinder Social Entrepreneurial Intention among engineering students.

In the case of Conscientiousness also has a negative and significant relationship with Social Entrepreneurial

Intention also indicates that being organized, efficient, practical, and systematic are the predictive behaviours that thwarted the Social Entrepreneurial Intention of engineering students.

4.3 Practical Implications

The outcomes of this study have important implications for developing nations like India, where researchers in the future should concentrate more on business sustainability and incorporate the Sustainable Development Goals of the United Nations as a means of gaining additional insights.

Furthermore, the study shows that a high sustainability orientation in addition to personality traits, respectively, indicates an elevated desire to find a social enterprise. Consequently, activities that heighten the appeal and lessen the perceived obstacles of venturing are likely to elicit higher levels of social entrepreneurial intention from individuals who are sustainability-oriented. Findings suggest that combining personality traits with sustainability orientation factors is the most effective way to support social entrepreneurship.

These results may assist in identifying individuals who are more likely to have a higher intention to launch a social enterprise and can also be used to build training and support programs that are specifically tailored for aspiring social entrepreneurs.

This study aids organizations and philanthropic financiers in more accurately recognizing and focusing on the upcoming generation of educators and social entrepreneurs. In light of how employment decisions are made early in life (Byrne, *et al.*, 2012), it is also suggested that the study be expanded to include adolescents. These studies might provide beneficial guidance on how to introduce the concept of social enterprise into the educational environment and inspire young students to formulate social entrepreneurial goals.

5. Conclusion

Engineering Students who exhibit conscientiousness and neuroticism are less likely to pursue social entrepreneurship than those who possess traits like agreeableness, extraversion, and openness. Yet, there is a favourable correlation between social entrepreneurial intention and sustainability orientation. The study's overall findings demonstrate the significance of sustainability orientation and personality traits in influencing social entrepreneurial intention. It is feasible to create interventions and support systems that are more successful in promoting and sustaining social entrepreneurship by having a better grasp of the elements that drive people to engage in social entrepreneurship. In the end, the study emphasizes the necessity of multifaceted strategies that take into account personality traits as well as the influence of sustainability orientation in an attempt to encourage socially conscious entrepreneurs and foster socially conscious intention. Future research could expand its scope by including participants from both engineering graduates and business management graduates. This broader approach would provide a more comprehensive examination of the comparative personality traits among these two groups of graduates. Additionally, exploring the influence of "entrepreneurial creativity" alongside personality traits and sustainability orientation could provide deeper insights into social entrepreneurial intentions.

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