

The Moderating Role of Financial Literacy Between Entrepreneurial Personality Traits and Entrepreneurial Self-Efficacy (ESE) – An Empirical Investigation

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ARTICLE INFO	ABSTRACT
Received: 05 Oct 2024	The purpose of this study is to investigate the effect of entrepreneurial personality traits (need for achievement (NaCH), innovativeness, proactiveness, and optimism) on entrepreneurial self-efficacy (ESE) of entrepreneurs, with the moderating role of financial literacy. A survey was conducted in Northern India using non-probability snowball sampling with the help of a measurement scale adopted from previous studies, and gathered a sample of 125 large-scale entrepreneurs. Grounded in Social Cognitive Theory (SCT), the proposed hypothesis was formulated and tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that (a) all four personality traits significantly predict ESE, highlighting their importance in fostering entrepreneurial confidence, (b) however, financial literacy does not significantly moderate these relationships, suggesting that intrinsic personality factors may wield a more direct influence on ESE than contextual financial knowledge. The novel contribution of this study shifts focus from student-based samples to actual entrepreneurs by critically evaluating the boundary conditions of trait–context interactions. This research presents several practical and theoretical implications for academics, government and non-government entrepreneurship-supporting organisations. The study also presents various future avenues which can help shape the field of entrepreneurial scholarship.
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Introduction

According to Salmony & Kanbach (2022), approximately 30% of the recent studies on entrepreneurial personality traits have relied on a student sample. However, Students with or without any entrepreneurial experience, or those without any entrepreneurial interest, are frequently used as proxies in the entrepreneurship literature, perhaps because of their easy accessibility. Drawing inferences from students' personality traits to their confidence in starting a venture may be problematic, as they are not actual entrepreneurs and often lack real-world entrepreneurial experience. Based upon this scarcity, our study relies more strongly on practicing entrepreneurs to more accurately assess the relationship between entrepreneurial personality traits and entrepreneurial self-efficacy (ESE). ESE plays another important characteristic that plays a vital role in driving individuals towards entrepreneurship. Entrepreneurial Self-efficacy, defined as an individual's belief in their capability to perform specific tasks (Bandura,1977; Bandura, 2001; McGee et al., 2009), is a critical psychological

factor of entrepreneurial intention (Acharya & Berry, 2023). Individuals with high self-efficacy are more likely to identify opportunities, take calculated risks, and pursue innovative activities. Therefore, understanding the characteristics of individuals who started and managed businesses is essential for promoting entrepreneurial activity and supporting ventures (Shane, 2003). Only very recently, the entrepreneurial finance literature picked up on these aspects to understand the behavior of individual entrepreneurs, for e.g., (Di Pietro & Tenca, 2023; Isaak et al., 2024; Andreoli & ten Rouwelaar 2024) examined the role of the entrepreneurial psychological characteristics in raising the external financial funds (Clark, 2008; Gruda et al., 2021), crowdfunding (Anglin et al., 2018; Bollaert et al., 2020; Buttice & Rovelli, 2020), determining their investment decisions (Franić & Drnovšek, 2019). Numerous studies on students' entrepreneurial traits towards intention had been conducted on various nations, like (Iakovleva et al., 2011; Olufunso, 2010), as well as in India (Roy & Das, 2020; Sharma & Jain, 2019; Singh et al., 2023; Sun, 2023). Where some studies argue that financial literacy helps entrepreneurs about the various financial concepts, products, services and financing methods to set up a start-up which assists them to make various financial decisions to perform better in terms of numeracy, risk diversification and tolerance (Lusardi & Mitchell, 2009), purchasing insurance, enhancing savings behaviour (Wachira & Kihui, 2012) because they have to work in complex environment, therefore they need to own ample knowledge of various financial services available to them to increase their business performance (Barte, 2012).

Literature Gap

An analysis of previously published literature, which attempts to investigate entrepreneurial profiles, indicates that solely big five personality traits model is insufficient to fully capture entrepreneurship's multifaceted aspects Hagenauer & Zipko (2024). The Big Five model summarizes behavioral tendencies at a high level of abstraction, limiting specificity and explanatory power in the entrepreneurial context (Kerr et al., 2019). The Big-5 inventory scale capture the self-image of respondents, which can be influenced by situational and contextual factors, leading to discrepancies between self-assessments and external assessments and show discrepancies between self-assessments and external assessments (Rammstedt & Kemper, 2011; Brice, 2004). Furthermore, these traits do not account for variability influenced by environmental and situational factors (Kerr et al., 2019). Additional theoretical lenses entrepreneurial traits, competencies, or orientation, may provide additional insights into entrepreneurial characteristics McClelland (1961) and Hansemark (2003), Rotter (1966), Bandura (1977, 1989) and Chen et al. (1998). These frameworks highlight the importance of traits like need for achievement (NaCH), innovativeness, proactiveness, optimism and entrepreneurial self-efficacy (ESE) play an important role in predicting entrepreneurial behavior (Leutner et al., 2014; Kerr et al., 2019; McCrae & Costa, 2008; Piovesan & Willadsen, 2021; Liang & Dunn, 2010). The meta-analyses studies reveal that differences in entrepreneurial personality traits vary significantly by environment and context, complicating generalized statements about these traits (Zhao et al., 2005; Zhao et al., 2010). Therefore, a multidimensional personality framework that includes traits such as need for achievement (NaCH), innovativeness, proactiveness, optimism, and entrepreneurial self-efficacy (ESE) is necessary to fully understand and predict entrepreneurial behavior (Kerr et al., 2018). This study identifies individual entrepreneurs' personality profiles after the first five years of their business activity, a critical phase for enterprise development and survival. Moreover, financial literacy is widely recognized as a crucial factor in entrepreneurial success. While a substantial body of research (e.g., Barte et al., 2012; Fatoki, 2014; Ali et al., 2017; Ebgo et al., 2020; Lestari et al., 2020) has examined the direct effects of financial literacy on the performance of micro, small, and medium-sized entrepreneurs, limited evidence exists regarding the moderating role, particularly among entrepreneurs. Therefore, the main focus of this study is to investigate the effect of entrepreneurial personality traits on ESE with the moderating effect of financial literacy of practicing entrepreneurs in the context of northern India by answering these research questions (RQs):

RQ1. How do various entrepreneurial personality traits (need for achievement (NaCH), innovativeness, proactiveness, and optimism) influence ESE among entrepreneurs?

RQ2. How does financial literacy moderate the relationship between entrepreneurial personality traits (need for achievement (NaCH), innovativeness, proactiveness and optimism) and ESE?

By answering these RQs, this study makes a very interesting contribution to the entrepreneurship literature. First, this research posits that four entrepreneurial traits, such as (NaCH, innovativeness, proactiveness and optimism) are significant antecedents to ESE. Second, this study underscores the non-significant moderating role of financial literacy, indicating that while financial knowledge is important, it may not strengthen the psychological link between entrepreneurial personality traits and ESE. Third, the findings may reinforce the significance of ESE as a driver of entrepreneurial behavior, underscoring the need for educational and capacity-building programs that cultivate self-belief and confidence in entrepreneurial contexts. Fourth, the conceptual model developed in the context of a developing nation (India) extends the burgeoning literature on entrepreneurship theory and practice.

Hypothesis Development

Need for achievement (NaCH) and ESE

Rooted in McClelland's (1961) theory of motivation, NaCH refers to the degree to which an individual sets ambitious goals and efforts to achieve them and derives satisfaction from the outcomes of their work (Tessema Gerba, 2012, p. 263). Individuals with a high NaCH are more likely to engage in competitive, innovative, and proactive behavior characteristics that align closely with entrepreneurial activities. According to Bandura (1977), individuals who believe they can achieve their goals tend to have higher self-efficacy beliefs. Such individuals are often self-driven and willing to take responsibility for outcomes, more suitable for entrepreneurial endeavors compared to those with lower NaCH. While ESE relates to an individual's confidence in completing given tasks and overcoming difficulties or hindrances, they tend to set challenging goals to satisfy their achievement motive (McClelland et al., 1985). Several studies in the past have documented a positive association of self-efficacy with the achievement motivation of individuals (Heslin & VandeWalle, 2008). For instance, (Chen et al., 1998) found that ESE significantly and positively impacts university students' need for achievement and success. In a similar vein, (Akhtar et al., 2020) emphasized a direct connection between NaCH and ESE an individual's belief in their capability to successfully perform entrepreneurial tasks. Individuals with high NaCH have more confidence in their capabilities, enjoy taking carefully calculated risks, examine their environment dynamically, are motivated to reach ambitious objectives, and have a strong drive to succeed. Following the literature, we offer the following hypothesis.

Hypothesis 1 (H1): *NaCH is positively associated with ESE among entrepreneurs*

Innovativeness and ESE

Rooted in social cognitive theory (Bandura, 2001), innovativeness is closely linked to self-efficacy, as innovative individuals are proactive and confident in their capabilities. Empirical studies supports this relationship such as Markman et al. (2002) observed that inventors with high self-efficacy are more likely to introduce their innovative products by founding new ventures, whereas those with lower self-efficacy tend to remain in established firms. Also, Babalola (2009) show that the higher ESE women entrepreneurs have, the more innovative they are: confidence in their ability to succeed leads them to differentiate themselves by their ideas and actions, to adopt a creative approach and to renew themselves. In this sense, Neck et al. (1999) demonstrate that the performance of the that corresponds to his risk-taking, his proactivity and especially his innovativeness is determined by his level of ESE. Moreover, individuals with high ESE and innovativeness are better equipped to adapt to dynamic market environments (Andersen et al., 2015). Based on this evidence, the following hypothesis is proposed:

Hypothesis 2 (H2): *Innovativeness is positively associated with ESE among entrepreneurs*

Proactiveness and Entrepreneurial Self-Efficacy (ESE)

Highly motivated people tend to have proactive personalities; as a result, they are comparatively unconstrained by external forces and are driven to change their environment (Stephan et al., 2016). Proactive nature is a proximal antecedent of self-belief and self-efficacy, both of which have been favourably associated with entrepreneurs (Wang et al., 2017). An empirical study of 275 people found that proactive entrepreneurs had substantially higher ESE (Van Ness et al., 2020). According to Prabhu et al. (2012), proactive personality and ESE significantly impact entrepreneurial intention. Given the importance of ESE, assisting proactive people in developing self-efficacy in entrepreneurship may result in more start-ups. When ambitious young men and women feel confident in their entrepreneurial ability, they may start their own firms. Based on this, we propose the following hypothesis:

Hypothesis 3 (H3): *Proactiveness is positively associated with ESE among entrepreneurs*

Optimism and ESE

An optimist is “someone who looks at the bright side of things and expects positive and desirable events happening in the future” (Carver et al., 2010; Seligman, 2006). Optimism has emerged as a pivotal factor significantly correlated with key elements of entrepreneurship. Notably, various studies have shown the effect of optimism with entrepreneurial intention (Baluku et al., 2019; Hwang & Choi, 2021), entrepreneurial alertness (Urban, 2020). According to, (Janssen et al., 2013) optimistic students have strong entrepreneurial intentions and are more inclined to pursue an entrepreneurial career. (Baluku et al., 2016) found that optimistic students are confident in their abilities to successfully translate their entrepreneurial ideas into reality. Similarly, (Hmieleski & Baron, 2009) corroborated that nascent entrepreneurs with dispositional optimism are more capable to deal with challenges and obstacles in pursuing new enterprises. Therefore, we expect optimistic traits have significant effect on ESE. Based on this, we propose the following hypothesis:

Hypothesis 4 (H4): *Optimism is positively associated with ESE among entrepreneurs*

Financial Literacy as a Moderator

“The ability to make judgments, effective decisions about the use and management of money” or “basic knowledge that people need to survive in a modern society” or “an ability to understand and make use of financial concepts” refer to as financial literacy (Beal & Delpachitra, 2003; Servon & Kaestner, 2008). Financial literacy consists of two dimensions such as “knowledge” and “application” (Huston, 2010). It encompasses knowledge and cognitive skills with a set of desirable attitudes, behaviours and external enabling factors (Lusardi, 2012). Financial literacy education allows individuals to develop solid business-related skills in decision-making regarding costs, revenues, and investments, thereby ensuring business success (Cupák et al., 2018).

Financial literacy as a moderator between NaCH and ESE

Entrepreneurs with high NaCH levels tend to be goal-oriented, resilient, and particularly sensitive to opportunities for enhancing performance (Brunstein & Heckhausen, 2018). This characteristic has consistently been associated with enhanced entrepreneurial performance and intention (Ismail, 2022), establishing it as a vital precursor to ESE. Nonetheless, having achievement motivation alone does not guarantee high ESE, individuals must also have the necessary cognitive skills to navigate the complexities of entrepreneurship. In this context, financial literacy serves a vital enabling function. Entrepreneurs who possess a strong desire for achievement tend to actively pursue and utilize financial knowledge to attain their objectives. Research indicates that entrepreneurs with financial literacy excel in strategic decision-making, resource management, and risk mitigation (Eniola & Entebang, 2015). This proficiency subsequently boosts their confidence in handling business responsibilities (Agyei,

2018; Tuffour et al., 2020). Therefore, financial literacy can act as a catalyst, enabling individuals with high NaCH to transform their achievement-oriented mindset into effective self-efficacy. Without adequate financial literacy, even the most motivation driven entrepreneurs may find it difficult to address financial challenges, which can undermine the connection between NaCH and ESE. With this empirical evidence, we suggest the following hypothesis:

Hypothesis 5 (H5): *Financial literacy moderates the relationship between NaCH and ESE, ESE becomes stronger (weaker) when the financial literacy is higher (lower) and vice versa*

Financial literacy as a moderator between innovativeness and ESE

Financial literacy plays a significant role in creating entrepreneurial ecosystems, especially for entrepreneurs who want to grow their businesses. It helps people make better financial decisions, assess risks, and get funding, which makes it easier to turn new ideas into real business opportunities (Burchi et al., 2021). Ramos-Escobar et al. (2024) found that CEOs' financial literacy has a positive effect on technological innovation in small and medium-sized businesses (SMEs), both directly and indirectly. Hutaayan (2021) also found that being financially literate is linked to better performance as an entrepreneur and more innovation. According to Giaccone and Magnusson (2022), people who think of themselves as innovative are also more likely to take risks. Liu et al. (2021) argues that psychological factors, along with financial literacy and creativity, affect how entrepreneurs make decisions. Despite this conceptual linkage, there is a little empirical research on how financial literacy moderates the relationship between innovativeness and ESE. With this in mind, we suggest the following hypothesis:

Hypothesis 6 (H6): *Financial literacy moderates the relationship between innovativeness and ESE, ESE becomes stronger (weaker) when the financial literacy is higher (lower) and vice versa*

Financial literacy as a moderator between proactiveness and ESE

Proactive entrepreneurs are more attuned to emerging market needs, take initiative, and demonstrate a forward-thinking mindset. Recent studies, such as those by Muñoz-Céspedes et al. (2024), finds that individuals with financial literacy demonstrate enhanced entrepreneurial proactiveness, improved opportunity recognition, and a greater likelihood of initiating and succeeding in business ventures. Bii et al. (2024) demonstrate that financial literacy positively impacts proactive sustainable entrepreneurship behaviors. People who possess greater financial knowledge tend to participate more in business practices that are environmentally and socially responsible. According to Fan et al. (2024), enhanced financial literacy amplifies the impact of entrepreneurial motivation whether driven by opportunity or necessity on entrepreneurial activity, thereby fostering greater proactiveness in business creation among those with financial knowledge. The main argument is that proactive individuals who possess low financial literacy may encounter challenges in implementing their ideas due to inadequate financial judgment, which in turn diminishes their perceived self-efficacy. This indicates that financial literacy could act as a contextual factor that enhances or diminishes the impact of proactiveness on ESE. In light of this, we present the following hypothesis:

Hypothesis 7 (H7): *Financial literacy moderates the relationship between proactiveness and ESE, such that the relationship is stronger at higher levels of financial literacy*

Financial literacy as a moderator between optimism and ESE

Optimism has been recognized as a key psychological trait influencing entrepreneurial intention, persistence, and opportunity recognition (Markman et al., 2002). Optimists tend to overestimate the likelihood of positive outcomes and underestimate risks (Meza & Southey, 1996), which can enhance motivation but may also lead to overconfidence and suboptimal decision-making, especially in uncertain environments. Where, ESE is positively influenced by optimism; however, excessive optimism can inflate ESE unrealistically, potentially compromising decision quality (Gudmundsson & Lechner, 2013). Empirical findings show that financial literacy can buffer the effects of financial fragility

and enhance financial optimism (Chhatwani & Mishra, 2021). Thus, it may also serve to temper optimism-driven bias by aligning confidence with financial reasoning. Despite growing attention to the independent effects of optimism and financial literacy on entrepreneurial behavior, their interactive effect on ESE remains underexplored representing a significant gap in the literature. Based on this, we propose the following hypothesis:

Hypothesis 8 (H8): *Financial literacy moderates the relationship between optimism and ESE such that the relationship is stronger when financial literacy is high*

The conceptual model is presented in Figure 1.

Methodology

Sampling

The primary objective of the study is to explore the impact of entrepreneurial personality traits and ESE with the moderating effect of financial literacy. We selected the registered entrepreneurs as respondents with the help of structured survey questionnaire and collected data from the northern part of India (three districts in Punjab).

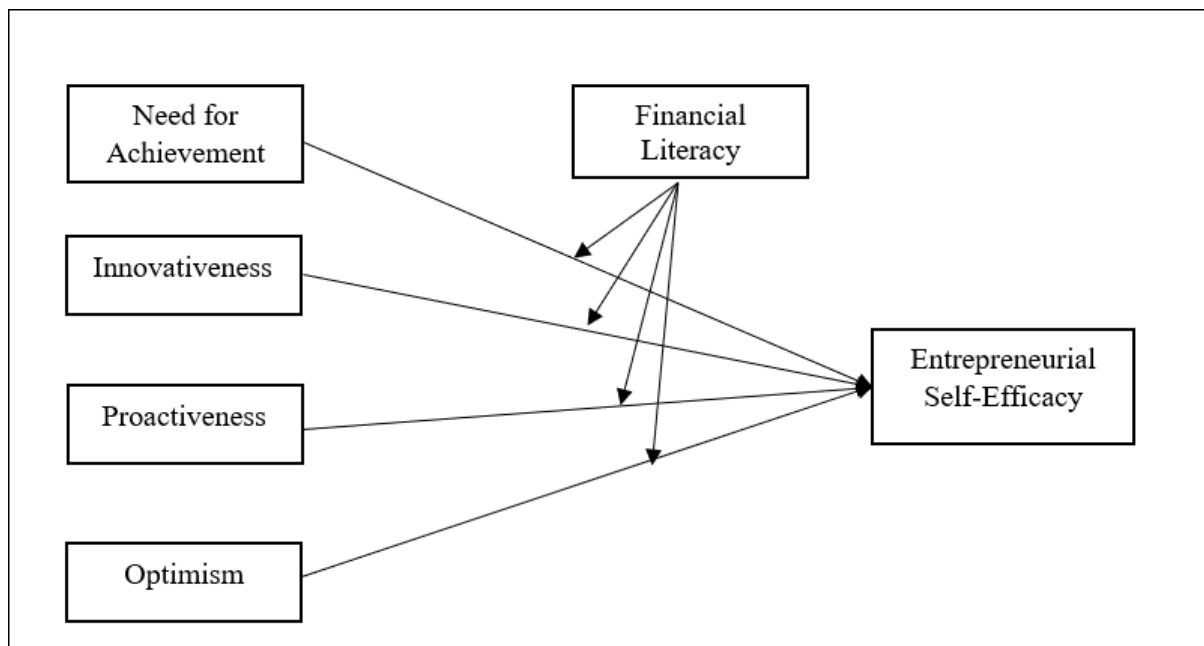


Figure 1. Conceptual Model

According to the GEM report 2023 Global Entrepreneurship Monitor, 2023) in India the north region has the highest scores for perceived opportunities, ease of starting a business, and perceived capability, indicating that people in this region have a positive outlook towards entrepreneurship. Therefore, the Punjab state in the north region of India was selected for the participants' entrepreneurs. We utilized a snowball sampling (non-probability sampling) method to select the appropriate target respondents. Given the difficulty in accessing a comprehensive and up-to-date sampling frame of entrepreneurs, snowball sampling was deemed appropriate to reach the desired population. To collect the target data, the researchers got in contact with entrepreneurship associations district industries centre (DIC) in Ludhiana (also known as Manchester of India), Mohali (known for its IT and biotech parks) and Amritsar districts to obtain the details about large entrepreneurs whose annual turnover is more than INR 5 CRORE and a minimum business age of five years. The data was collected from May 2024 to July 2024. The questionnaire was sent to more than 200 entrepreneurs. The initial sample of respondents

consisted of 157 entrepreneurs yielding 78% responses. After excluding 32 respondents who has responded with same response and does not meet the threshold for inclusion of responses to the mandatory questions, we proceeded with 125 responses.

Demographic Profile

Table 1 illustrates the demographic profile of respondents where 81 (64.8%) males and 44 (35.2%) females.

Table 1. Demographic Profile

Category	Profile	Total Number	Percentage
Gender	Male	81	64.8%
	Female	44	35.2%
Age	Between 18 - 25 Years	9	6.4%
	Between 26 - 35 Years	39	30.4%
	Between 36 - 45 Years	46	36.8%
	Between 46 - 55 Years	22	17.6%
	56 Years - Above	12	8.8%
Education	Completed High School	9	7.2%
	Graduation or Equivalent	55	44%
	Post-Graduation or Equivalent	43	34.4%
	Doctoral or Post-doctoral	15	12%
Type of Business	Sole-Proprietorship	36	28.8%
	Partnership	34	27.2%
	Family-Owned Business	38	30.4%
Industry of Business	IT/Tech Startups	18	14.4%
	Manufacturing	24	19.2%
	Retail & Trade	33	26.4%
	Service	27	21.6%
	Hospitality & Tourism	22	17.6%

Measures

Measuring variables reduces their ambiguity since they pass from a latent construct to an observable and measurable one. The questionnaire included 28 questions relating to dependent, independent and moderating variable constructs adapted from well-established scales from previous studies as shown in Table 1. The indicators were adapted to suit the context and purpose. All constructs were measured on a 5-point-likert scale (anchored as '1' = strongly disagree; and '5' = strongly agree).

NaCH trait was measured using the 5 items developed by (Steenkamp et al., 2024). The sample items reads as follows “Professional achievements are an obsession to me”.

Innovativeness trait was measured using the three items developed by (Lone & Baba, 2024). The sample items reads as follows “I actively introduce improvements and innovations in my business”.

Proactiveness trait was measured using the three items developed by (Lone & Baba, 2024). The sample items reads as follows “I always try to take the initiative in every situation (e.g. against competitors, in projects when working with others)”

Optimism trait was measured using the five items developed by (Strömbäck et al., 2017). The sample items reads as follows “I expect my financial future to be better than it is now”

ESE trait was measured using the five items developed by (Le et al., 2023). The sample items reads as follows “I show great ability for creativity and innovation”

Financial Literacy was measured using the seven items developed by Huston (2010). The sample items reads as follows “I have better understanding of how to invest my money”.

Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) was performed to evaluate the measurement model's validity and reliability. The model was estimated with 185 degrees of freedom. The model yielded a chi-square/df ratio of 2.296, which falls within the acceptable range of less than 5:1 (Wheaton et al., 1977). The integrity-of-fit index (GFI) is equal to 0.93, tucker lewis index (TLI) is 0.66, the adjusted goodness-of-fit index (AGFI) is 0.70, the normed fit index (NFI) is 0.759, the Bollen's incremental fit index (IFI) is about 0.96, the comparative fit index (CFI) is about 0.70 and the root-mean-squared error of approximation (RMSEA) is about 0.08. A RMSEA of 0.08, in general, provides a good fit of the model to the data (Browne & Cudeck 1993).

Testing the normality Assumption

Before conducting the further analysis, for normality testing the skewness and kurtosis were checked. According to Hair et al. (2011), the normal range for the skewness kurtosis value is accepted within $< \pm 2.58$. All of the variables of our study are within the normal range. Specifically, the skewness values range within -0.893 to +0.044, and kurtosis values range from -1.010 to +0.227. Suggesting that the data for all observed variables are approximately normally distributed at the univariate level, satisfying the assumption for further analysis.

Measurement

To examine the internal consistency of a scale, its reliability and its validity, we use Cronbach's α which has to be superior to 0.7 (Hair et al., 1998). Table 2 illustrates the significant reliability of all items and indicates that all indices surpassed the accepted values. For every construct, the composite reliability values (β) (ranging from 0.77 to 0.86) and Cronbach's values (ranging from 0.56 to 0.80) exceed the generally accepted value of 0.70, while the NaCH construct had a lower value (0.567) which is still considered acceptable in exploratory research (Hair et al., 2011); the AVE values (ranging from 0.50 to 0.62) exceed the generally accepted value of 0.5. Hence, convergent validity is reasonable.

Discriminant Validity

Discriminant validity was assessed by employing Heterotrait-Monotrait Ratio of Correlations (HTMT) and Fornell Larcker Criterion. HTMT values for all construct pairs were well within the acceptable threshold of 0.90 as shown in Table 2 indicating satisfactory discriminant validity for all constructs used in the model (Hair et al., 2017). Table 3 shows the Fornell Larcker Criterion test, which postulates that a construct's square root of Average Variance Extracted (AVE) should be greater than its

correlations with other constructs (Fornell & Larcker, 1981). As shown in Table 3, all bold diagonal values (representing the square roots of AVEs) are higher than the off-diagonal inter-construct correlations in their respective rows and columns.

Variance Inflation Factor (VIF)

However, we also incorporated a statistical check for multicollinearity using the variance inflation factor (VIF) for all the variables. Table 4 displays the inner VIF as well as outer VIF. The VIF of less than 5 represents that multicollinearity is not a problem. Where our VIF values are (ranging from 1.1 to 1.8), reducing concerns of multicollinearity or overlap.

Common Method Bias

Common method bias (CMB) is a problem in survey-based research, particularly within the social sciences. To assess this, Harman's single-factor test was conducted in IBM SPSS v31, as recommended by Podsakoff et al. (2003). The results showed that the single factor accounted for 25.971% of the total variance, which is well below the 50% threshold, which confirms that CMB is unlikely to be a significant issue.

Structural Model

To test the hypothesis, we analysed the structural model as shown in Figure 2. The path coefficients were presented in Table 5. The results show that the effect of NaCH on ESE was positive and significant ($\beta = 0.079$, $p < .047$), thus supporting H1. H2 proposes that innovativeness is positively related to ESE and significant where ($\beta = 0.089$, $p < .048$), thus H2 was supported. The effect of proactiveness on ESE was positive and significant ($\beta = 0.092$, $p < .009$), thus H3 was also supported. H4 proposes that the relationship between Optimism and ESE was positive and significant ($\beta = 0.084$, $p < .033$), thus H4 was supported. To test the H5, H6, H7, H8, we include financial literacy as moderator between entrepreneurial traits (need for achievement, innovativeness, proactiveness and optimism) and entrepreneurial self-efficacy. The moderation effect of these are illustrated in Figure 3, 4, 5 and 6. The beta coefficient of the interaction term: NaCH x financial literacy indicates that this relationship is not significant ($\beta = -0.092$, $p = 0.311$), thus H5 is not supported. The regression coefficients of Innovativeness x financial literacy indicates that this relationship is not significant ($\beta = -0.079$, $p = 0.363$), thus H6 is not supported. Further the beta coefficient of the interaction term: Proactiveness x financial literacy represents that these results are also not significantly related ($\beta = 0.129$, $p = 0.226$), thus H7 is not supported. Lastly, the optimism x financial literacy indicates that this relationship is not significant ($\beta = -0.006$, $p = 0.962$), thus H8 is also not supported.

Table 2. Results of Measurement Properties

Measurement Scale		Construct/Item	β	Cronbach's α	Composite Reliability	AVEC
NaCH	NaCH1	Professional achievements are an obsession to me	0.720	0.567	0.771	0.530
	NaCH4	Achieving greater success than my peers is important to me	0.652			
	NaCH5	I want my achievements to be recognised by others	0.805			
Innovativeness	INNO1	I actively introduce improvements and innovations in my business	0.808	0.648	0.810	0.587
	INNO2	The operational activities on my business are creative	0.724			
	INNO3	I seek out new ways to do things in my business	0.764			
Proactiveness	PRO1	I always try to take the initiative in every situation (e.g. against competitors, in projects when working with others)	0.807	0.673	0.819	0.601
	PRO2	I excel at identifying opportunities	0.713			
	PRO3	I initiate actions to which other entrepreneurs respond	0.803			
Optimism	OPT1	I expect my financial future to be better than it is now	0.784	0.70	0.830	0.620
	OPT2	I am confident that I will achieve my financial goals	0.807			
	OPT3	Even during difficult times, I am optimistic about my investments	0.771			
ESE	ESE1	I show great ability for creativity and innovation	0.704	0.767	0.843	0.519
	ESE2	I show great aptitude for leadership and problem-solving	0.739			
	ESE3	I can develop and maintain favorable relationships with potential investors	0.697			
	ESE4	I can see new market opportunities for new products and services	0.657			

	ESE5	I can develop a working environment that encourages people to try out something new	0.798			
Financial Literacy	FINL2	I have better understanding of how to invest my money	0.695	0.807	0.861	0.509
	FINL3	I have better understanding of how to manage my credit use	0.696			
	FINL4	I have a very clear idea of my financial needs during retirement	0.706			
	FINL5	I have the ability to maintain financial records for my income and expenditure	0.706			
	FINL6	I have little or no difficulty in managing my money	0.694			
	FINL7	I have better understanding of financial instruments (e.g., bonds, stock, T-bill, future contract, option, etc.)	0.779			

Note: The indicators NaCH2, NaCH3, OPT4, OPT5, and FINL1 were excluded from the analysis due to low factor loadings.

Table 3. Heterotrait-Monotrait Ratio of Correlations (HTMT)

	ESE	FINL	INNO	NaCH	OPT	PRO	FINL x PRO	FINL x OPT	FINL x INNO	FINL x NaCH
ESE										
FINL	0.730									
INNO	0.823	0.723								
NaCH	0.746	0.539	0.613							
OPT	0.654	0.590	0.442	0.452						
PRO	0.711	0.435	0.825	0.709	0.406					
FINL x PRO	0.251	0.222	0.331	0.331	0.074	0.244				
FINL x OPT	0.134	0.174	0.097	0.158	0.209	0.064	0.133			
FINL x INNO	0.069	0.125	0.037	0.269	0.101	0.346	0.612	0.180		
FINL x NaCH	0.125	0.288	0.242	0.053	0.048	0.341	0.570	0.153	0.500	

Table 3. Fornell-Larcker Criterion

	ESE	FINL	INNO	NaCH	OPT	PRO
ESE	0.721					
FINL	0.585	0.713				
INNO	0.587	0.527	0.766			
NaCH	0.511	0.361	0.394	0.728		
OPT	0.476	0.448	0.298	0.307	0.787	
PRO	0.521	0.317	0.541	0.452	0.276	0.776

Table 4. Outer VIF and Inner VIF

Outer VIF				Inner VIF	
Indicator	VIF	Indicator	VIF	Indicator	VIF
ESE1	1.508	INNO1	1.314	FINL -> ESE	1.797
ESE2	1.576	INNO2	1.228	FINL x INNO -> ESE	2.020
ESE3	1.384	INNO3	1.273	FINL x NaCH -> ESE	1.935
ESE4	1.281	NaCH1	1.150	FINL x OPT -> ESE	1.094
ESE5	1.657	NaCH4	1.173	FINL x PRO -> ESE	2.251
FINL2	1.422	NaCH5	1.173	INNO -> ESE	2.007
FINL3	1.505	OPT	1.332	NaCH -> ESE	1.606
FINL4	1.441	OPT2	1.384	OPT -> ESE	1.378
FINL5	1.666	OPT3	1.335	PRO -> ESE	1.908
FINL6	1.568	PRO1	1.268		
FINL7	1.869	PRO2	1.297		
		PRO3	1.413		

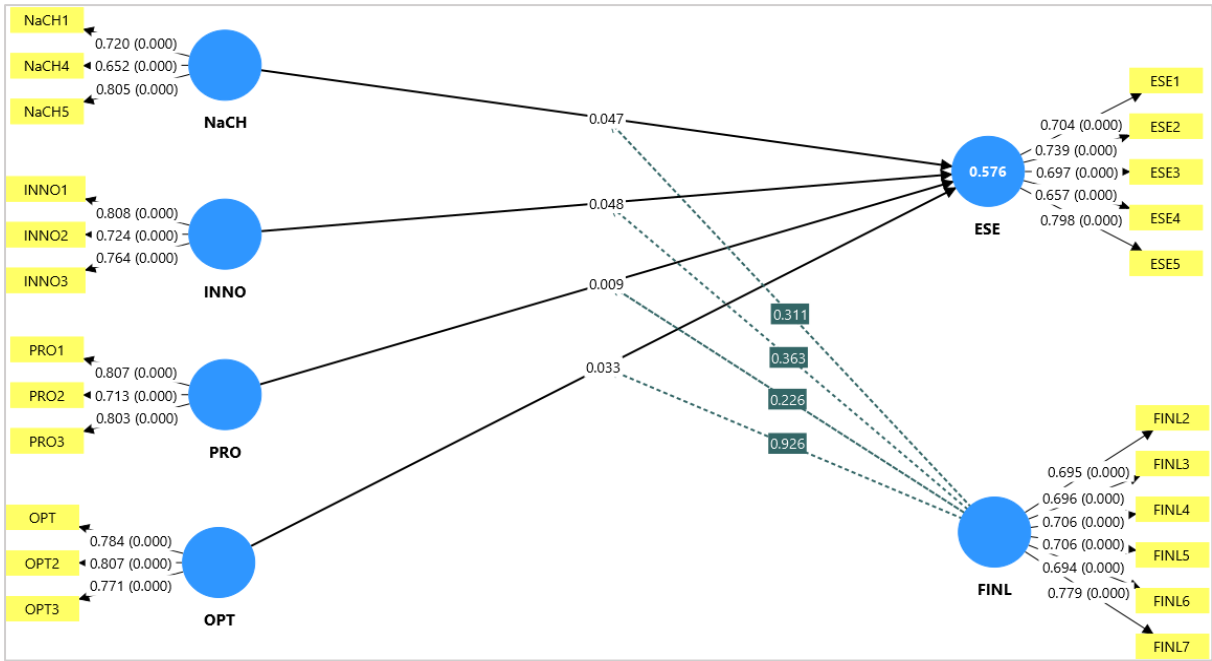


Figure 2. Structural Model

Table 5. Path Coefficients

Path Coefficient	Hypothesis	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Results
NaCH -> ESE	H1	0.156	0.164	0.079	1.984	0.047***	Supported
INNO -> ESE	H2	0.176	0.189	0.089	1.981	0.048***	Supported
PRO -> ESE	H3	0.241	0.233	0.092	2.620	0.009**	Supported
OPT -> ESE	H4	0.179	0.186	0.084	2.128	0.033***	Supported
FINL -> ESE	H5	0.277	0.260	0.098	2.825	0.005**	Supported
FINL x NaCH -> ESE	H6	-0.092	-0.069	0.091	1.013	0.311	Not Supported
FINL x INNO -> ESE	H7	-0.079	-0.078	0.087	0.909	0.363	Not Supported
FINL x PRO -> ESE	H8	0.129	0.114	0.106	1.211	0.226	Not Supported
FINL x OPT -> ESE	H9	-0.006	-0.023	0.068	0.093	0.926	Not Supported

Note: Sig level ** = 0.01; *** = 0.001;

Predictive Values and Effect Size

We tested the predictive relevance of the sample by using the blindfolding technique. This technique allows one to omit a part of the data matrix and the results are used to predict the omitted part. Smart PLS software has the capability of calculating the Q^2 , and the higher the value of Q^2 , the less is the deviation in estimated and original values. Hair et al. (2014) recommend Q^2 predictive indices of 0.02 (small), 0.15 (medium) and 0.35 (large). Therefore, Table 6 illustrates the Q^2 value of ESE, which is 0.179 demonstrates a medium effect.

Table 6. R^2 and Adjusted R^2 ; Q^2 and Effect Size

Indicator	R-square	Adjusted R^2	Q^2 -Square	Effect Size
ESE	0.576	0.543	0.179	Medium

R^2 of Exogenous Variables

The predictive accuracy of the model can be assessed using the coefficient of determination R^2 for the endogenous construct. According to Hair et al. (2014), an R^2 value of 0.75 or higher indicates substantial predictive accuracy, 0.50 is considered moderate, and 0.25 or below reflects weak predictive power. Therefore, the R^2 value of ESE is 0.576, which was considered as moderate. It shows entrepreneurial traits with the moderating effect of financial literacy explaining 57.6% variance in ESE, suggesting a strong model fit.

F^2 Effects

We also calculated the effect size by using the following formula (Hair et al., 2014).

$$F^2 = (R^2_{\text{included}} - R^2_{\text{excluded}}) / (1 - R^2_{\text{included}})$$

The suggested values are 0.02 (small effect size), 0.15 (medium effect size) and 0.35 (large effect size). The f^2 values are shown in Table 7.

Table 7. F^2 values

	1	2	3	4	5	6
1. Need for Achievement					0.036	
2. Innovativeness					0.036	
3. Proactiveness					0.072	
4. Optimism					0.55	
5. Entrepreneurial Self-Efficacy					0.101	
6. Financial Literacy						

Discussion

The pivotal aim of the present study is to uncover the moderating effect of financial literacy in the relationship between entrepreneurial traits and ESE. A simple conceptual model was presented, and the hypothesised relationships were tested by collecting data from 124 entrepreneurs from the northern part of India (Punjab). The results validated the conceptual model (see Figure 2).

The key findings of this study provide empirical support for several hypothesized relationships. **First**, the positive association between need for achievement (NaCH) and entrepreneurial self-efficacy (ESE) (H1) aligns with previous studies in the literature (Fallah et al., 2023; Soomro & Shah, 2022). While our study offers fresh empirical proof of these conflicting relationships among a sample of large entrepreneurs. **Second**, our study supports the positive relationship between innovativeness and ESE (H2), corroborating previous findings (Andersen et al., 2015; Markman et al., 2002). Research in organizational behavior has consistently shown that innovative individuals tend to exhibit higher levels of self-efficacy (Rodrigues & Rebelo, 2023), a relationship further supported by social cognitive theory, which posits that self-efficacy facilitates goal-oriented innovation (Bandura, 2001; Ng & Lucianetti, 2016). **Third**, proactiveness emerged as a significant predictor of ESE (H3), consistent with findings from existing literature (Prabhu et al., 2012; Stephan et al., 2016; Van Ness et al., 2020; Wang et al., 2016), suggesting that proactive behavior is instrumental in fostering entrepreneurial self-efficacy. **Fourth**, optimism also shows a significant direct effect on ESE (H4), supporting findings that highlight the role of entrepreneurial self-efficacy as a pathway through which optimism enhances ESE (Madar et al. 2019; Ramos-Rodriguez et al. 2010; Storey 2011; Wang et al., 2021). The significant effect suggests that the optimism trait in entrepreneurs directly enhances entrepreneurial self-efficacy. **Fifth**, interestingly, this study found that financial literacy does not moderate the relationship between NaCH and ESE (H6). Though not extensively studied, the available scant research supports the finding from this research (Fan et al., 2024; Muñoz-Céspedes et al., 2024). **Sixth** key finding of the study is that acting financial literacy does not moderate the relationship between innovativeness and ESE (H7). Aligning with previous studies (Duréndez et al., 2023). **Seventh** finding of this study, that financial literacy does not act as a moderator between proactiveness and ESE (H8), aligns with previous studies (Muñoz-Céspedes et al., 2024). While proactiveness significantly predicts ESE, the strength of this relationship remains unaffected by levels of financial literacy. **Eighth** finding of this study is, financial

literacy does not moderate the relationship between optimism and ESE (H9). Aligns with previous findings (Baluku et al., 2018; Zhang et al., 2023), with several studies indicating that high optimism and personality traits can drive entrepreneurial intentions regardless of financial skills. Some evidence suggests that financial skills shape entrepreneurial profiles, but not necessarily moderate the influence of optimism on ESE (Ruiz-Dotras & Masllorens, 2022). Thus, the present study validated the conceptual model presented.

Implications

Theoretical Implications

The theoretical underpinnings of this study anchored in the social cognitive theory (SCT) (Bandura, 2001). This study contributes to the theoretical development of SCT with several findings. **First**, this study underscores the importance of entrepreneurial personality traits towards ESS. It also found that personality traits consists of NaCH, innovativeness, proactiveness and optimism is a significant antecedent of ESE. These traits represent internal personal determinants which shapes self-efficacy beliefs and, by extension, entrepreneurial behavior. **Second**, including financial literacy as a mediating effect between entrepreneurship personality traits and ESE highlights that external competencies like financial literacy may not always interact with psychological traits as moderators. The non-significant moderating role of financial literacy identifies important boundary conditions for trait-behavior models. It challenges the assumption that contextual variables universally enhance trait-driven outcomes and suggests that intrinsic motivators may override external enablers in shaping ESE offering a nuanced addition to Trait Activation Theory. **Third**, this research contributes context-specific theoretical insights by employing a sample of practicing entrepreneurs in India. While most of the recent literature relies on student samples from developed economies, this study puts its model within a developing economy, thereby enhancing the cultural and institutional relevance of SCT and advancing theoretical generalizability across contexts.

Practical Implications

This study provides several practical implications for entrepreneurship development and policy. **First**, it confirms that core entrepreneurial traits, namely, need for achievement, innovativeness, proactiveness, and optimism, are significant predictors of ESE. This underscores the value of personality-based training and mentorship programs designed to nurture these traits, particularly among aspiring and early-stage entrepreneurs. **Second**, the non-significant moderating role of financial literacy suggests that while financial knowledge remains vital for operational success, it may not directly enhance the psychological drivers of entrepreneurship. This finding highlights the need for interventions that balance technical financial training with efforts to build motivational and behavioral competencies. **Third**, the findings reinforce the centrality of ESE in shaping entrepreneurial behavior, indicating that capacity-building programs should prioritize the development of self-belief and confidence. Educational institutions and entrepreneurship support organizations should design experiential learning environments where individuals can engage in real-world projects and prototype ventures. Facilitating interactions between experienced entrepreneurs and those with entrepreneurial aspirations, such as through incubator mentoring, peer-learning networks, or policy-sponsored accelerators, can help bridge the intention-action gap.

Conclusion

Through empirical validation of the role of key entrepreneurial personality traits (NaCH, innovativeness, proactiveness, and optimism) in influencing ESE among entrepreneurs in an Indian (developing economy), this study adds to the body of literature on entrepreneurship. The economic and industrial growth of a nation is significantly influenced by entrepreneurship. Therefore, the promotion of entrepreneurial activities is required in both developing as well as developed economies. The findings highlights the importance of motivational drivers and innovativeness is crucial for entrepreneurial

confidence among entrepreneurs. This study further indicated that entrepreneurs with higher self-efficacy could be more innovative, optimistic, proactive and motivated in launching new ventures.

Limitations and Future Research Directions

This study has several limitations despite its contributions. **First**, the study focused on large entrepreneurs whose annual turnover is more than INR 5 CRORE and a minimum business age of five years in the northern Indian state of Punjab by using a small sample size. Future studies can use a large sample size, which would make the findings more generalisable. **Second**, this study has focused on only four entrepreneurial traits. Future research should expand the scope of entrepreneurial traits by featuring additional psychological and behavioral constructs that are known to shape entrepreneurial behaviour. Moreover, emerging studies emphasize the relevance of dark triad traits (Machiavellianism, narcissism, and psychopathy) as nuanced predictors of entrepreneurial behavior, particularly in high-growth or high-risk ventures. Exploring these traits across different entrepreneurial sub-types, such as necessity-driven vs. opportunity-driven, or serial vs. nascent entrepreneurs, could offer more granular insights into the diversity of entrepreneurial personalities. **Third**, examining personality traits as stand-alone constructs may be insufficient for fully understanding entrepreneurial behavior. Instead, these traits should be viewed within environmental, social, and personal contexts, including other factors, such as an individual's attributes, culture, and social influences. Moreover, in later stages of entrepreneurship, firm-level characteristics may interact with individual traits to influence venture performance (Palmer et al., 2019a, b). **Fourth**, given the non-significant moderation effect of financial literacy observed in this study, future research should explore a broader set of contextual and psychological moderators that may influence the relationship between entrepreneurial personality traits and ESE. Further studies may include such as entrepreneurial education or training, access to social support networks, and perceived environmental uncertainty. Demographic variables such as gender, age, entrepreneurial experience, and industry sector should also be examined for their potential interactive effects.

Declarations

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