

Personality Traits of Traditional Entrepreneur and Digital Entrepreneur: A Systematic Literature Review

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Abstract

The popularity of digital entrepreneurship as a research stream is gaining scientific traction in recent years courtesy of the role of digitalization in the commercial sphere. It is acknowledged that the personality traits of the entrepreneur play a vital role in the success of entrepreneurship. Since the emergence of the entrepreneurship concept, there have been countless researches on the personality traits of traditional entrepreneurs (TE) and only a handful on the personality traits of digital entrepreneurs (DE). Most scholars offer similar scientific treatment to DE as TE because digital entrepreneurship is a form of entrepreneurship. Some scholars argue that digital entrepreneurship is distinctly different from traditional entrepreneurship, thus, the scientific discovery of the personality traits of DE should be viewed differently. Are DE different from TE in terms of their personality traits? Or are they the same? This paper aims to investigate the differences between the personality traits of TE and DE. A systematic literature review of recent studies on the personality traits of TE and DE is conducted. The result shows that while both TE and DE share certain similar traits like a low score in agreeableness and neuroticism but a high score in openness, conscientiousness, and extraversion, DE scores lower in both neuroticism and conscientiousness dimensions compared to TE. The limited literature on trait differences warrants further research on other trait dimensions between these two breeds of entrepreneurs.

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1.0 INTRODUCTION

Entrepreneurship, a term derived from the French verb “entreprendre” (Carton et al., 1998), is defined as a business that bears the risk of buying and selling goods in the early 1700s. From then onwards, many scholars attempted to define entrepreneur and entrepreneurship until Schumpeter (1934) offered the modern concept of entrepreneurship which is widely used by academicians and practitioners until today (Carton et al., 1998). Entrepreneurship is a process whereby individuals pursue opportunities to exploit future goods and services without confining to the present resources (Barringer et al., 2019). Schumpeter (1934) defined entrepreneurs as those who carry out the functions of entrepreneurship, including both business owners and employees. According to Carton et al. (1998), there are two distinct approaches in defining entrepreneurship. The first way is to provide a definition to entrepreneurs and define entrepreneurship based on what they do. The second approach is to establish the definition of entrepreneurship and its related business behaviours and thereby reach the definition of entrepreneurs. Due to its significant contributions to

economic growth, job creation, and technological advancements, entrepreneurship is widely recognized as a critical component for success in today’s society (Obschonka et al., 2017). It is observed that there is a growing interest in entrepreneurship in the last few decades (Mehta et al., 2014).

For the past 40 years, the scope and meaning of entrepreneurship have changed tremendously and given birth to new forms of entrepreneurship, including digital entrepreneurship (Giones et al., 2017). Digital entrepreneurship is defined as an entrepreneurial initiative to create digital value by utilizing diverse socio-technical digital facilities to promote efficient digital information processing, procurement, distribution, and consumption (Sahut et al., 2021). Digital entrepreneurship encompasses everything novel and innovative about entrepreneurship in a digital world (Amadi et al., 2022). Digital entrepreneurship is one of the most sought-after entrepreneurship types due to its vast benefits to businesses (Ballı, 2020). The emergence of digital entrepreneurship is contributed mainly to technological advancement in the 2000s (digital entrepreneurship is also

known as cyber entrepreneurship, internet entrepreneurship, or e-entrepreneurship) (Hansen, 2019; Zaheer et al., 2019). For this paper, non-digital entrepreneurship is known as traditional entrepreneurship. Digital entrepreneurship is a different type of entrepreneurship that cannot be viewed as a subclass of traditional entrepreneurship, even though it is a form of entrepreneurship (Bejinaru, 2021). Hull et al. (2007) point out that traditional and digital entrepreneurship are distinctly different in terms of digital products, digital service, ease of production and storage, ease of market access, ease of digital market distribution, digital workplace, and digital commitment. The use of informational technology is also a key differentiator between the two (Wang et al., 2020). Digital entrepreneurship can be classified into three types: mild, moderate, and extreme (Hull et al., 2007). Mild digital entrepreneurship uses digital activities to complement conventional business activities. In moderate digital entrepreneurship, we can see a substantial allocation of investment and resources on digitalization. Lastly, in extreme digital entrepreneurship, the entire business is digital. Bejinaru (2021) identifies three key elements in digital entrepreneurship: the entrepreneur, entrepreneurial process, and the related ecosystem. Asghari et al. (2010) identify the four stages in the digital entrepreneurship process as pre-seed, seed, start-up, and final expansion.

The success of entrepreneurship is highly influenced by the personality traits of the entrepreneur as the entrepreneur is the captain of entrepreneurship. There have been many years of research on the personality traits of traditional entrepreneurs (TE), but only a handful on the personality traits of digital entrepreneurs (DE). With the growth of digital entrepreneurship, it is cardinal to understand the personality traits differences between these two types of entrepreneurs (Bandera et al., 2020; Chae et al., 2020). Are they very different or are they indifferent (this is not a suitable word) Indifferent means uncaring. The suggestion is to use the phrase ‘the same’? The paper aims to offer valuable insights on this topic by systematically reviewing past literature on personality traits. Understanding the distinct personality traits of TE and DE can offer those who endeavour to venture into entrepreneurship personal development guidance. Future research agenda will be offered for the scientific community to expand the body of knowledge in this domain.

2.0 LITERATURE REVIEW

2.1 Personality Traits

The term trait has been a source of much ambiguity and confusion, referring to dispositions, temperaments, personality, and abilities, as well as any persistent features of the individual, including demographic and physical attributes, at various times and in varied ways (Barker, 2001). Nonetheless, personality traits can be defined as inclinations to respond in a particular way in a variety of situations (Caprara et al., 2000; Rauch et al., 2007) with high endurance and stability across time (Baum et al., 2014; Roccas et al., 2002). Personality traits are the fundamental differences between individuals (Matthews et al., 2003). In the twentieth century, there were many studies and debates in the field of psychology circling personality traits, giving birth to multiple trait models, out of which the five-factor model (FFM) or the big-five model (Goldberg, 1992) stands out as the most predominant model (Feher et al., 2021). Psychologists use the FFM and the big-five model interchangeably (McCrae et al., 2008). While the FFM is the prevalent personality model, there are other variables outside the big-five domain (Paunonen et al., 2001), including the sixteen-personality factor model (16PF) (Cattell, 1946), the HEXACO model (Ashton et al., 2007), the Supernumerary Personality Traits (SPI) (Paunonen, 2002), and Eysenck Personality Inventory (EPI) (Eysenck et al., 1968). Each of these models has some form of similarities, but mostly differences. It is noted that researchers continue to work on ways to best structure and summarize personality traits (Zettler et al., 2020).

The origin of the big-five model started with the application of the lexical hypothesis to personality by Galton (1884), who believed that language is the root of individual character differences. Subsequently, researchers such as Allport et al. (1936), Cattell (1945), and Tupes et al. (1961) continued to identify and narrow down the list of personality traits. The term “big five” was coined by Goldberg (1981) to describe this five-factor model of personality. While there were variations of the wording and meaning of these five factors, eventually they were settled as openness (O), conscientiousness (C), extraversion (E), agreeableness (A), and neuroticism (N) (Goldberg, 1992), also known as OCEAN (Feher et al., 2021). It is noted that the FFM is applicable across various studies and able to reflect many systems of personality

description (Brandstätter, 2011; Jayawickreme et al., 2019; John et al., 2008). Feher et al. (2021) argue that the FFM is currently the dominant model of personality traits due to its vast usage in research, causing researchers to apply the model without question. The language employed when addressing personality connotes the idea (intentionally or unintentionally) that by assessing FFM, they have accounted for all-important differences in personality (DeYoung, 2015).

In FFM, openness is a basic notion in personality traits that allows one to study new information to attract a situation (McCrae, 1987). Openness includes open to feelings, open to experience (Dan et al., 2021; Driessen et al., 2007), open to new ideas, knowledgeable curiosity (Barrick et al., 1991; Mayfield et al., 2008), and open to diverse behaviours. Conscientiousness is defined as the willingness to complete a specific task, connoting the readiness to remain reliant and persistent until the project is completed (Murugesan et al., 2017). Facets of conscientiousness include achievement-oriented (Abubakre et al., 2020), determination (Barrick et al., 1991; Mayfield et al., 2008), competence, perseverance (Ali, 2019), orderly, dutiful, self-disciplined, and deliberate (Diener et al., n.d.). Extraversion deals with the direction of one's attention, energy, and orientation (Driessen et al., 2007) and is used as a key indicator of social behaviour (Dan et al., 2021). Extraversion can be an assessment of one's vitality in terms of excitement, dominance, talkativeness, and activeness (Zheng, 2019). Introversion is characterized by an inner orientation, while extraversion is characterized by an outward orientation (Driessen et al., 2007). Friendliness, talkativeness, assertiveness, optimism, being joyful and vigorous are examples of extraversion (Barrick et al., 1991; Mayfield et al., 2008). High extraversion scores are associated with being warm, friendly, chatty, gregarious, active, and outgoing, as well as assertiveness and dominance in social interactions (Şahin et al., 2019). Agreeableness is characterized by trust, sympathy, concern towards others, modesty, amiability, altruism, utility, and collaboration (Barrick et al., 1991; Costa et al., 1992; Digman, 1990; Mayfield et al., 2008). Selden et al. (2018) state that people with high agreeableness are less likely to perceive conflict, provoke conflict in others, or respond to conflict with power assertions. Variations in positive and negative emotions are reflected under neuroticism (Soto, 2019). Words like timidity, tenseness,

anxiety, and moodiness are commonly associated with neuroticism (Barrick et al., 1991; Mayfield et al., 2008). Highly neurotic individuals are likely to demonstrate poor self-esteem, sadness, impulsivity, mood fluctuations, depression, anger, impulsivity, and vulnerability to stress (Costa et al., 1992; Dan et al., 2021; Digman, 1990). Easily feeling socially anxious and lacking social skills are found in people high in neuroticism (Smółka et al., 2011). Ali (2019) finds that high neuroticism also means a tendency of having negative feelings and overreacting emotionally.

A well-established personality traits questionnaire is the sixteen-personality factor model (16PF) developed by Cattell (1946). The 16PF is a comprehensive and frequently used assessment of normal, adult personality that was produced through factor-analytic study into personality's underlying structural aspects (Cattell et al., 2008). The 16PF has a long history of empirical research and is based on a well-established notion of individual differences, credits to its scientific beginnings. There have been four major changes since its first publication in 1949, the most recent being the 16PF fifth edition (Cattell et al., 1993). It is vastly applied globally and available in over thirty-five languages worldwide (Cattell et al., 2008). Many studies identified the 16PF as one of the top five most commonly applied normal-range personality models (Butcher et al., 1996). Unlike the FFM, the 16PF is a multi-level structured model, starting with sixteen primary traits which can provide the fundamental definition of individual personality differences. These primary traits are abstractedness, apprehension, dominance, emotional stability, liveliness, openness to change, perfectionism, privateness, reasoning, rule-consciousness, self-reliance, sensitivity, social boldness, tension, vigilance, and warmth. These more specific core characteristics are more effective in comprehending and predicting the complexities of actual behaviour (Roberts et al., 2005). Based on these primary traits, the broader 'second-order' or global factors were formulated – the original big-five (Cattell et al., 2008). Researchers found that the multiple fundamental qualities regularly coalesced into these broad dimensions, each having its unique focus and function within the personality. Cattell et al. (2008) state that the hierarchical structure is founded on the premise that all qualities are interconnected in the real world, where global traits provide a broad picture of personality, whilst primary traits provide more granular

information about the individual's richness and uniqueness. The five global factors are factor-analysed to identify the third order which is the highest and most abstract level in the model (Cattell, 1945, 1957, 1973). Although attempts were made to identify the third-order factors, they are not satisfactory and more investigation is required (Cattell et al., 2008). Active outward engagement and self-disciplined practicality were suggested as the factors for the third-order.

Although the second-order of the 16PF has some similarities with the FFM, they are nonetheless distinctively different. Cattell et al. (2008) state that the biggest difference between the two models is the method used in the development of the primary level traits, where the 16PF was based on countless scientific researches, but the FFM was a consensus decision among a few psychologists. Furthermore, in FFM, the five factors are not correlated as a result of using orthogonal rotation analysis, but the sixteen primary traits in the 16PF are correlated, and oblique rotation analysis is required. Nonetheless, Conn et al. (1994) found that the traits in the two models are correlated, such as FFM openness with 16PF openness to experience, FFM conscientiousness with 16PF self-control, FFM extraversion with 16PF extraversion, FFM agreeableness with 16PF independent, and FFM neuroticism with 16PF anxiety.

2.2 Traits of Traditional Entrepreneurs

Literature on the motivation of entrepreneurs and the influence of their traits concerning the success of the business can be traced back to the eighteenth century (Kerr et al., 2018). Frank Knight's book *Risk, Uncertainty, and Profit*, published in 1921, was a significant launching point for rigorous and meticulous research on the personalities of entrepreneurs that distinguished them from typical business managers (Astebro et al., 2014). While personality in entrepreneurship has been extensively researched, it was abandoned in the 1980s due to a lack of consistency in the results (Bandera et al., 2020). In the mid-twentieth century, research on entrepreneurs' personality traits revived and exploded, merging methodologies from sociology, psychology, business management, and economics to answer these questions: Who is an entrepreneur? What motivates them? What are an entrepreneur's traits? (Kerr et al., 2018). Entrepreneurship theory requires knowledge of not just how entrepreneurs

differ from non-entrepreneurs in terms of personality, but also whether personality qualities are linked to business success (Rauch et al., 2007). Researches on entrepreneur intention (Farrukh et al., 2018; Liñán et al., 2006; Munir et al., 2019; Murugesan et al., 2017; Şahin et al., 2019; Vuorio et al., 2018; Zamri et al., 2020; Zhao et al., 2010b) and the success factors of an entrepreneur (Angel et al., 2018; Baron, 2000; Barringer et al., 2019; Burt et al., 2020; Nuvolari et al., 2018; Papzan et al., 2008; Rauch et al., 2007; Shimoli et al., 2020; Singh et al., 2013) are popular due to its somehow related nature.

Unlike employees, entrepreneurs are exposed to a great risk of failure, a slim chance of exceptional results, potential low financial return, and tremendous time commitments (Kerr et al., 2018). Entrepreneurs are constantly facing challenges in financial and operations stability (Wei et al., 2019). They are a different breed in the general population. Entrepreneurs being the soul of entrepreneurship, the influence of personality traits in entrepreneurial decisions and actions has emerged as a focal point of the study (Şahin et al., 2019). There were many studies on the personality traits of entrepreneurs (Kerr et al., 2018). The FFM is popular among researchers in studying personality traits of entrepreneurs (Brandstätter, 2011; Şahin et al., 2019; Zhao et al., 2010b), but there are some researchers who opt to use other specific traits in their studies (Almeida et al., 2014; Cuesta et al., 2018; Mukherjee, 2016; Obschonka et al., 2019; Rauch et al., 2007). Other personality trait models, such as the 16PF, HEXACO model, the SPI, and the EPI, are seldom used by researchers. McClelland (1987) mentions that there were forty-two unique entrepreneur's characteristics found in literature, including knowledge of product and market, identified initiative, intelligence, commitment to work contract, initiative, confidence, diligence, perseverance, efficiency orientation, resourcefulness, versatility, creativity, perceptiveness, assertiveness, foresight, energy, and systematic planning. Kerr et al. (2018) believe that besides the big-five model, locus of control, innovativeness, entrepreneur self-efficacy (ESE), and need for achievement should be considered in determining the personality traits of an entrepreneur. With relatively simple interventions, achievement motivation and self-efficacy can influence personality traits (Rauch, 2014). Specific traits, such as locus of control, risk tolerance, or need for achievement, which rely on an explicit description of entrepreneurial

activities that may be situated in time, place, and role are more helpful in predicting entrepreneurial performance than the FFM (Barrick, 2005). Lambing et al. (2000) think that qualities like risk-management, perfectionism, tolerance against uncertainty, self-confidence, determination, and creativity are found in entrepreneurs. Need for achievement, innovativeness, generalized self-efficacy, need for autonomy, stress tolerance, and proactive personality were the attributes linked to entrepreneurship that were significantly correlated with entrepreneurial behaviour (Rauch et al., 2007).

Cassar et al. (2009) define self-efficacy as a person's confidence in accomplishing tasks, carrying out roles and is related to expectations, motivation, and objectives. Generalized self-efficacy and ESE are two specificities of self-efficacy. ESE is the sum of self-efficacy in five areas: marketing, innovation, financial control, risk-taking, and management (Chen et al., 1998). The term "innovativeness" refers to how people react to new situations (Goldsmith et al, 2003). Innovativeness can be viewed as a general or domain-specific personality trait, as well as a behavioural term such as consumer acceptance of innovative products. Although there are several methods for measuring innovativeness, there is no single standard thus far (Kerr et al., 2018). Locus of control (LOC) was first conceptualized in Rotter's (1954) theory of social learning. Individuals with external LOC believe that fate, chance, or uncontrollable environmental variables are the real controlling forces (Anwar et al., 2019), whereas those with internal LOC believe that their effort and ability can influence outcomes (Khushk et al., 2019). Countries with more individualistic cultures exhibit greater internal LOC, making it a culturally dependent trait (Müller et al., 2005). Need for achievement (nAch) from McClelland's (1987b) acquired-needs theory, is related to one's drive for major accomplishment, skill mastery, and achieving tough goals (Staniewski et al., 2019). It is critical for entrepreneurship since entrepreneurs must be enthusiastic about their work to succeed. Many researchers find it predictive to the entry into entrepreneurship. Stress tolerance is vital since entrepreneurs often have a heavy workload, experience financial and personal risks. They need to remain calm in situations often described as high insecurity and pressure. Entrepreneurs' desire for autonomy is linked to their avoidance of constrictive environments; they prefer to make decisions independently of supervisors, to set their

own goals and develop their action plans, and to be in charge of goal achievement. People with a high demand for autonomy want to be in charge, so they sidestep the constraints and norms of established organizations by taking on the role of an entrepreneur (Cromie, 2000).

Henrekson et al., (2014) mention that it is quite challenging to determine the criterion for differentiating entrepreneurs from non-entrepreneurs. Most researchers like to use managers as the comparison for entrepreneurs because both groups have to manage workers and multiple tasks (Kerr et al., 2018). Kerr et al. (2018) argue that research on entrepreneurial characteristics should (1) take a larger representative sample, using longitudinal data, (2) measure traits before entry decisions, and (3) measure other traits like ESE and risk aversion. Researchers tried to build a robust theoretical framework and proper measurement instruments in the first few decades but were met with many conceptual obstacles (Kerr et al., 2018).

2.3 Traits of Digital Entrepreneurs

In the twenty-first century, digital technologies are driving the creation of new ventures (Kraus et al., 2019). As digital technologies have begun to play important roles in innovation and entrepreneurial activities, digital entrepreneurship has emerged as a field (Chae et al., 2020). Nonetheless, there are limited studies on digital entrepreneurship (Jafari, 2020; Nambisan, 2017) and DE (Hull et al., 2007). E-entrepreneurship is defined by an active search for changes and a quick response to these changes, as well as the identification of opportunities for the implementation of innovations and new technologies, such as internet technologies, that transform traditional business models into e-business models (Jelonek, 2015). An internet entrepreneur is someone who is either the founder of a new internet-related business or runs a new enterprise in the ICT industry (Glavas et al., 2014). DE is also referred to as e-entrepreneur, cyber entrepreneur, internet-enabled entrepreneur, and e-commerce entrepreneur in literature (Sofian, 2018). The personal traits of the entrepreneur are important to the success of digital entrepreneurship (Jafari, 2020). Shimoli et al. (2020) believe that DE should carry certain personality traits that will reduce market risks.

There is no difference between DE and TE in terms of knowledge (Gustavsson et al., 2018). However, there

are conflicting views on identifying the personality traits of DE and TE. On one hand, some researchers feel that since digital entrepreneurship is a subset of entrepreneurship, both DE and TE should share the same personality traits (Shimoli et al., 2020). On the contrary, studies are highlighting the differences between digital ventures and other types of ventures (Zaheer et al., 2019). Jafari (2020) claims that the unique characteristics of digital technologies have made digital entrepreneurship an entirely new field of research. Hafezieh et al. (2011) identified seven key differences between digital and traditional entrepreneurship: ease of entry, ease of manufacturing, ease of storage, ease of distribution, digital workplace, digital goods and services, and digital commitment. Thus, DE should be differentiated from TE (Bandera et al., 2020; Chae et al., 2020; Jafari, 2020; Santos et al., 2021). To truly understand DE, those traits distinctive for digital over the non-DE need to be identified (Chae et al., 2020).

3.0 METHODOLOGY

This paper aims to examine differences between the traits of DE and TE by conducting a systematic literature review (SLR) (Kraus et al., 2020; Satalkina et al., 2020). A three-stage SLR was applied: planning, execution, and analysis (Antonizzi et al., 2020). A plan based on the research objective and the approach in which the review will be done is being developed. Based on this plan, execution covers the selection of data sources and the gathering of data to follow suit. Lastly, a thorough analysis of the data collected, including synthesizing data, is being carried out. Primary sources of literature are peer-reviewed academic articles from Scopus and Google Scholar databases. The following keywords were applied for the search: for traits of digital entrepreneur included “Traits of Digital Entrepreneur” OR “Traits of Internet Entrepreneur” OR “Traits of Cyber Entrepreneur” OR “Traits of E-entrepreneur” OR “Characteristics of Digital Entrepreneur” OR “Characteristics of Internet Entrepreneur” OR “Characteristics of Cyber Entrepreneur” OR “Characteristics of E-entrepreneur”. For traits of traditional entrepreneur included “Traits of Entrepreneur” OR “Traits of Traditional Entrepreneur” OR “Characteristics of Entrepreneur” OR “Characteristics of Traditional Entrepreneur”. The time frame of the search is limited to articles in the recent 5 years. The initial search identified a list of 2,022 papers.

Next, the list was further screened based on specific criteria such as peer-reviewed publications, English papers, conference proceedings, and journal articles. Duplication was removed. After the selection process and removing duplication, 37 papers were shortlisted for detailed analysis as shown in Table 1.

Table 1: Literature search and selection

	Traits of Digital Entrepreneur	Traits of Traditional Entrepreneur
Initial Search		
Scopus	13	16
Google Scholar	996	997
Total	1,009	1,013
Final Selection		
Scopus	5	3
Google Scholar	12	17
Total	17	20

4.0 RESULTS & DISCUSSION

4.1 Results

There were many studies on the personality traits of an entrepreneur, but most of these researches do not explicitly separate DE and TE. Most of these studies like to compare entrepreneurs with office managers (Astebro et al., 2014). The FFM was the most widely used personality trait theory in these studies, with a few studies which opt for the 16 PF model. Some studies incorporate other traits, such as ESE, need for achievement, LOC, and risk-taking. A summary of personality traits in literature is provided in Table 2, with no differentiation between personality traits of DE and TE. There was limited literature on the differences in personality traits between DE and TE.

Entrepreneurs are found to be more open than managers (Obschonka et al., 2017). It is believed that higher openness can empower entrepreneurs to handle the novelty of new challenges in the constantly changing business environments, and those who can come out with unique solutions, and relevant business concepts are likely to be successful (Kerr et al., 2018). Entrepreneurs have higher conscientiousness than managers and this is perhaps the most significant difference trait observed (Zhao et al., 2006). Even though entrepreneurs and managers are similar in dependability, entrepreneurs are more efficient and organized because they have to handle many tasks within a limited time. However, in a separate study, managers scored higher in conscientiousness than

Table 2: Personality traits of the entrepreneur (inclusive of DE and TE)

Personality traits		Literature
The FFM/Big Five Model		
Openness	+	Antoncic et al. (2015), Brandstätter, (2011), Chae et al. (2020), Elenurm et al. (2009), Envick et al. (2000), Obschonka et al. (2017), Zhao et al. (2006)
Conscientiousness	+	Brandstätter, (2011), Chae et al. (2020), Obschonka et al. (2017), Zhao et al. (2006)
	-	Envick et al. (2000)
Extraversion	+	Antoncic et al. (2015), Brandstätter, (2011), Chae et al. (2020), Obschonka et al. (2017)
	-	Envick et al. (2000)
Agreeableness	-	Antoncic et al. (2015), Chae et al. (2020), Envick et al. (2000), Zhao et al. (2006)
Neuroticism	-	Chae et al. (2020), Envick et al. (2000), Zhao et al. (2006)
Sixteen Personality Factors (16PF)		
Abstractedness	+	Cattell et al. (2008)
Apprehension	-	Aldridge (1997)
Dominance	+	Aldridge (1997)
Emotional stability	+	Aldridge (1997)
Openness to change	+	Aldridge (1997), Cattell et al. (2008)
Reasoning	+	Aldridge (1997)
Rule-consciousness	+	Aldridge (1997)
Self-reliance	+	Aldridge (1997), Cattell et al. (2008), Fraboni et al. (1990)
Sensitivity	-	Aldridge (1997)
Social boldness	+	Aldridge (1997)
Vigilance	+	Aldridge (1997), Fraboni et al. (1990)
Warmth	-	Aldridge (1997), Fraboni et al. (1990)
Others		
ESE/Self-efficacy	+	Cassar et al. (2009), Chen et al. (1998), Singh et al. (2013)
Need for achievement	+	Collins et al. (2004), Korunka et al. (2003), Stewart et al. (2007)
Locus of control (LOC)	Internal	Evans et al. (1989), Korunka et al. (2003), Levine et al. (2017), Singh et al. (2013)
Flexibility	+	Elenurm et al. (2009), Singh et al. (2013)
Risk-taking	High	Chen et al. (1998), Elenurm et al. (2009), Hall et al. (2010), Singh et al. (2013), Stewart et al. (2001)
	Med	Korunka et al. (2003)
	Low	Miner et al. (2004), Xu et al. (2004)
Creativity	+	Elenurm et al. (2009)
Determination	+	Elenurm et al. (2009)
Ability to make decisions	+	Singh et al. (2013)
Goal-oriented	+	Singh et al. (2013)

Source: Author's compilation

entrepreneurs and Envick et al. (2000) explain that entrepreneurs are generally more risky, flexible, and impulsive, while managers are more cautious, organized, and structured. Generally, entrepreneurs have higher extraversion than managers (Antoncic et al., 2015). Most entrepreneurs have to shoulder the responsibility of sales and marketing, making extraversion a useful trait to them. In a different study, Envick et al. (2000) found out that entrepreneurs were less extroverted than managers, and suggested that this could be a result that these are small businesses entrepreneurs operating from their homes, staying away from large bureaucracies. Entrepreneurs score slightly lower in agreeableness and neuroticism than managers (Zhao et al., 2006). This can be explained by

most entrepreneurs are least worried about pleasing others because they eventually become CEOs of their businesses (Kerr et al., 2018). Zhao et al. (2006) state that entrepreneurs score lower in neuroticism than managers because entrepreneurs need to show exceptional self-confidence in many aspects when starting a venture.

Aldridge (1997) finds that entrepreneurs generally have higher dominance, emotional stability, openness to change, reasoning, rule-consciousness, self-reliance, social boldness, and vigilance than others in the 16PF model. Cattell et al. (2008) conclude that entrepreneurs score higher in abstractedness. At the same time, entrepreneurs have a lower score in apprehension,

sensitivity, and warmth (Aldridge, 1997; Fraboni et al., 1990).

Many researchers conclude that entrepreneurs have higher ESE and need for achievement (Chen et al., 1998; Korunka et al., 2003). Unlike working in an organization where responsibility is shared collectively, a high need for achievement can motivate entrepreneurs to build a venture from ground zero (Kerr et al., 2018). Mueller et al. (2001) discover that the need for achievement may vary across cultures and countries. Entrepreneurs have internal LOC because the belief of being able to influence the outcome motivates them to engage in entrepreneurial activities (Levine et al., 2017; Rotter, 1966). Despite numerous studies on entrepreneurial risk attitudes, there is no single model which can reasonably explain risk preference distribution among entrepreneurs (Kerr et al., 2018). Generally, entrepreneurs have high risk-taking traits (Hall et al., 2010), but not in the case of PSED entrepreneurs (Xu et al., 2004). Xu et al. (2004) explain that by placing identity fulfilment and autonomy higher than monetary gain, risk-averse entrepreneurs are willing to start high-risk ventures. Risk-taking trait varies differently based on the type of business. Risk-loving entrepreneurs are more prone to introducing new products to stimulate growth through innovation (Cucculelli et al., 2013). Necessity entrepreneurs are more risk-averse than opportunity entrepreneurs, and entrepreneurs who are motivated by creativity tolerate higher risk than other entrepreneurs (Block et al., 2015). Elenurm et al. (2009) acknowledge that flexibility, creativity, and determination as traits of entrepreneurs. In another research, Singh et al. (2013) conclude that ability to make decisions and being goal-oriented are commonly found in entrepreneurs. In a regional study, Obschonka et al. (2019) identified that Chinese entrepreneurs display interpersonal relatedness (IR). The sub-facets of IR include traditionalism, renqing (good deed), face (dignity), discipline, and harmony.

Table 3: Differences in personality traits between DE and TE

Personality traits		Literature
The FFM/Big Five Model		
Conscientiousness	Lower than	Chae et al. (2020)
Neuroticism	Lower than	Bandera et al. (2020), Chae et al. (2020)

Source: Author's compilation

There was a handful of literature that distinguish the personality trait differences between DE and TE as shown in Table 3. Chae et al. (2020) discover that both DE and TE show low scores in agreeableness and neuroticism, but high scores in openness, conscientiousness, and extraversion. From the limited literature, there is evidence to conclude that DE scores lower in both neuroticism (Bandera et al, 2020) and conscientiousness (Chae et al., 2020) dimensions compared to TE. Chae et al. (2020) explain that due to the dynamic nature of digital entrepreneurship, lower conscientiousness for DE enables them to remain up-to-date and competitive. Bandera et al. (2020) found out that DE pays lesser attention to the future than TE. Both DE and TE show a significant statistical correlation between anxiety and firm performance. While the correlation is positive among DE, it shows negative among TE, implying that (a) anxiety among DE can positively impact their determination to succeed, and (b) DE are better at controlling their anxieties because they are used to risky behaviours (Bandera et al., 2020).

4.2 Discussion

There have been controversial discussions in the literature on the role of personality traits in the entry of entrepreneurship as well as the successful running of businesses (Rauch et al., 2007). There is limited incremental progress in entrepreneurial traits research because multi-disciplinary literature development resulted in no standardized terminology (Kerr et al., 2018). As the business world evolves, the scope of entrepreneurship also changes. Entrepreneurs need to be versatile enough to adapt to the evolutionary phases of the business and embrace different challenges (Bygrave et al., 1992). This gives rise to two challenges: (1) the traits exist before entry of entrepreneurship or are they developed after becoming entrepreneurs (Kerr et al., 2018), and (2) the different stages of entrepreneurship are likely to demonstrate slightly different trait dimensions (Antoncic et al., 2015). One of the purposes of identifying the traits of an entrepreneur is to have a better prediction of entrepreneurship outcome. Even when the traits exist before entrepreneurship entry, it is hard to conclude that the trait was the causal factor (Kerr et al., 2018). Thus, while there are significant opportunities, there are also enormous challenges for the development of theoretical approaches and constructs that can be empirically

measured to determine the causal effect between psychological traits and entrepreneurial outcomes (Kerr et al., 2018).

The heterogeneous nature of entrepreneurs poses some difficulties to traits study. The selection of a sample can have an impact on the results as some variance can appear because of the small sample size (Antoncic et al., 2015; Envick et al., 2000). Unless it is a targeted study, researchers should attempt to collect a bigger sample size for better results. Entrepreneurship does not happen in a vacuum, but rather in an ecosystem. Factors like personality traits, the surrounding environment, financial and human capital weave the background for each endeavour to start and run a new business. Researchers must approach their setting with caution, taking into account the complex and integrated nature of entrepreneurship, to obtain valid conclusions (Kerr et al., 2018).

Currently, most personality trait studies adopt the FFM framework. While it is a rather universal framework (Jayawickreme et al., 2019), it cannot be predictive of situation-specific behaviours of entrepreneurs (Rauch, 2014). Other personality trait theories, such as the HEXACO model (Ashton et al., 2007), the Supernumerary Personality Inventories (SPI) (Paunonen, 2002), and the Eysenck Personality Inventory (EPI) (Eysenck et al., 1968), can be considered in entrepreneurship research as well. Frustrated with the generality limitations of the FFM, many multidimensional personality frameworks were developed and used (Kerr et al., 2018), including the Measure of Entrepreneurial Talents and Abilities (META) (Ahmetoglu et al., 2011; Almeida et al., 2014), the High Entrepreneurship, Leadership, and Professionalism (HELP) (di Fabio et al., 2016), Entrepreneurial Aptitude Test (Favretto et al., 2003), the Entrepreneurial Guidance Questionnaire (Sánchez, 2010), the Battery for the Assessment of the Enterprising Personality (BEPE) (Cuesta et al., 2018), the Entrepreneurial Intention Questionnaire (Liñán et al., 2006), General Enterprising Tendency (Caird, 2006), and the Skills Confidence Inventory (Betz et al., 2005). While we are seeing progress, we are still far from establishing a reasonably good and universally applicable framework.

Study on the traits of DE is in its infancy. Some researchers just treat digital entrepreneurship as a subset of entrepreneurship and therefore, assume that both DE

and TE are the same (Shimoli et al., 2020). Clearly, digital entrepreneurship demands different treatment from traditional entrepreneurship due to its uniqueness (Bandera et al., 2020). Even if a different path is adopted, defining and determining DE may not be an easy task given the complexity of today's business world (Quinones et al., 2015).

5.0 CONCLUSION AND FUTURE RESEARCH

Entrepreneurship is an integral part of the business world. Over the past forty years, entrepreneurship has been one of the popular research streams in the scientific community, giving birth to new forms of entrepreneurship, including digital entrepreneurship. Both academicians and practitioners acknowledge the role of entrepreneurs and the importance of their personality traits in determining the success of entrepreneurship and thus, devoted substantial scholarly attention to investigating these topics. As a consequence, there is extant literature on the personality traits of entrepreneurs. However, this paper has revealed the insufficiency in research on the personality traits of DE and the trait differences between DE and TE. In literature, we see many scholars treating DE indifferently to other types of entrepreneurs, deriving from the conclusion that DE and the same as TE. This should not be the case as there is sufficient scientific evidence supporting the notions that (1) digital entrepreneurship is not just a subset of entrepreneurship, but a unique type of entrepreneurship that demands separate attention, and (2) due to the different entrepreneurial activities involved, DE is likely to demonstrate different traits than TE. Studies have shown that personality traits of the entrepreneur can greatly influence the success of the business and thus, identifying the traits of DE can be helpful to new DE (decision of entry), existing DE (identifying gaps and limitations), and TE (for digital transformation). It would be sad to see TE who plan to adopt digitalization ignoring the succinct differences of DE's personality traits and reducing the success opportunities of the digital new ventures.

This paper has several limitations. First, the results of this study are confined to the literature found through the search. Second, other than the FFM and the 16PF, literature adopting other personality trait theories studies were not found, and thus, not considered. Third, there was limited literature found on the study of DE vs non-DE.

Despite available literature on the personality traits of an entrepreneur, the research stream on personality traits of DE and the trait differences between DE and TE are relatively young domains that need plenty of scholarly attention. Research scientists can consider using other personality trait theories, such as the HEXOCO model, SPI, and EPI, to investigate entrepreneurs' traits. There are great opportunities in developing a multidimensional model taking into account the key differences between DE and non-DE. Once such a model has been tested rigorously, it can be used to identify traits differences and make a better prediction on digital business success. Before the development of such a universal multidimensional model, more studies on trait differences between DE and TE are required. As digitalization is getting more popular, we are seeing new breeds of DE, such as millennial entrepreneurs, live streaming entrepreneurs, and short video entrepreneurs. The development of digital entrepreneurship can offer great research opportunities for the enrichment of understanding of DE.

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