

**ATTENTION-DEFICIT/ HYPERACTIVE DISORDER AND INDIVIDUAL  
ENTREPRENEURIAL ORIENTATION; THE MEDIATING ROLE OF  
ENTREPRENEURIAL RESILIENCE AND IMPULSIVITY AMONG  
PAKISTANI ENTREPRENEURS**



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## **DEDICATION**

To the woman, I see in the mirror

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شکریہ

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## Abstract

Attention-deficit/ hyperactive disorder (ADHD) and entrepreneurship forays have been theorized to be associated with each other due to the nature of symptoms of the former and the environment of the latter. Regardless the literature remains scarce and requires empirical statistical testing to establish literature further. The current study uses the lens of the Disadvantaged Entrepreneurs Theory to examine the relationship between ADHD and individual entrepreneurial orientation (IEO), with mediating role of entrepreneurial resilience (ER) and impulsivity (IMP). Furthermore, how ‘hyper focus’ (HF) affects the path between predictor and the outcome variable. Data was collected through a survey questionnaire from entrepreneurs across Pakistan and was analyzed through SPSS for descriptive statistics, coefficients of correlation, and hypotheses testing through PROCESS Macro. Similarly, model fitness was tested through confirmatory factor analysis in AMOS. Results showed a significant positive correlation between ADHD tendency and IEO. This correlation is mediated significantly and positively by ER whereas was not significantly mediated by IMP, although it showed negative relation. Additionally, HF moderated positively the ADHD-tendency and IEO relationship with only low hyper-focus significantly moderated mediation of ER and IMP on ADHD and IEO. This study adds to the emerging literature of associating mental health (clinical and non-clinical) with entrepreneurship as well as helps in establishing domain-specific entrepreneurship psychology theory that has been broad till recent past. Moreover, the DET is further established and supported through the results of this study. Furthermore, it adds to the explanation of the variable hyper-focus. Additionally, educators can help ADHD adolescents and adults in selecting a career path fit for their characteristics. This will also be helpful for managers and training firms.

## Chapter 1

### Introduction

In this era of disruption, uncertainty, and fast paced changes, orientation towards entrepreneurial actions have become an alternative source for people (Uy et al., 2015) to survive and sustain. These people include those that are termed ‘normal’ by society or those who exhibit a different behavior and termed ‘deviant’ or ‘differently-abled’. Entrepreneurship has been defined by Shane (2012) “as the process of discovery/co-creation, evaluation, and exploitation of opportunities to produce goods and services.” The increased trend of self-employment (Verheul et al., 2016), the higher exhibition of entrepreneurial orientations (Verheul et al., 2015), and its positive relation with mental and cognitive capacities like ADHD (Thurik et al., 2020; 2016), the literature is discussed scarcely. Although the literature on entrepreneurship is multi-disciplinary and has diverse theoretical and practical implications, but it will not be an understatement that people can become self-employed for constructive career orientation or as means to steer vital changes in society (Newman et al., 2019). Therefore, psychology and its knowledge go hand in hand with business, way before the advent of entrepreneurship. Wiklund, Patzelt, and Dimov (2016) considered psychological perspectives as the ‘*building blocks of the study of entrepreneurship*’, regardless diagnosed disorders, psychiatric and psychological symptoms, and the tendency to develop a psychological illness have been studied less across the literature. Diagnosed disorders or psychiatric/clinical exhibition of symptoms are seldom to never associated with nonclinical areas such as entrepreneurship. This is because diagnosed disorders disrupt the collection of first-hand data and hence the validity of the study (Verheul et al., 2015). Hence the researcher approached this area of entrepreneurship and ADHD at a non-clinical level.

However, the literature seems to have tilted towards the negative effect of psychological disturbances and disorders, weighing down the positive impact a psychological capability may have on business ownership or entrepreneurship. It is not exclusive to Attention-deficit Hyperactive disorder (ADHD) or its likelihood symptoms or tendency (Wiklund, Patzelt, and Dimov, 2016). The term entrepreneurs assert an individual that has ample energy, dares risky behaviors, shows resilience, and flourishes in times of adversity (Markman, Baron, and Balkin, 2005). This description fits well with ADHD (diagnosed or likelihood), supported by anecdotal evidence of successful entrepreneurs who are diagnosed or have high clinical symptomology of

ADHD such as Paul Orfalea (Kinko's), David Neeleman (JetBlue Airlines), Ingvar Kamprad (Ikea), Richard Branson (Virgin Group), etc. This alleges that there may exist a relationship between ADHD and entrepreneurship but only small empirical evidence exists to assess the claims' viability (Verheul et al., 2015; Mantyla et al., 2012; White and Shah, 2011). The fraction of available literature has studied the personality and traits with entrepreneurship (Caliendo, Fossen, and Kritikos, 2014; Ilouga et al., 2014; Lee et al., 2011) but no explicit take from the symptom's perspective exists (Hatak et al., 2020; Miller & Brenton-Miller, 2017). Hence the door to investigate the impact of ADHD parallel to entrepreneurship is open to investigating (Yu, Wiklund, & Pérez-Luño, 2019; Wiklund et al., 2018).

To study this association of entrepreneurship and ADHD tendency, positivistic approach was opted as it focuses on objective data, while minimizing the researcher's bias (Saunders et al., 2021) and was based on measurable data points aimed to develop causal and/or correlational relationship (Scotland, 2012). The study adopted questionnaires and collected data from 371 entrepreneurs to test, demonstrate and generalize the hypothesized model.

The research reports significant positive correlation between ADHD tendency and Individual Entrepreneurial Orientation (IEO), significantly and positively mediated by entrepreneurial resilience (ER) whereas not significantly mediated by impulsivity (IMP). Moreover, it is the first study to empirically and statistically assess that hyper-focus (HF) moderated positively the ADHD-tendency and IEO relationship with only low hyper-focus significantly moderating the mediation of ER and IMP on ADHD and IEO. The study enriches the newly emerging scholarly interest in associating mental health (clinical and non-clinical) with entrepreneurship, albeit at the non-clinical level. It informs the disadvantaged entrepreneurs' theory and helps in establishing domain-specific entrepreneurship psychology theory that has been broad till recent past. The current study challenges the negative connotation of differently abled cognitive capacities. Additionally, the study adds robustness, and weight to the relationship between ADHD and IEO as the relationship is studied in a new culture than studied before.

### **1.1. Theoretical background**

*'Finding or having a fitting job matters'* (Van vianen, 2018). Individuals put in considerable effort and substantial time in 'questing' for a suitable career path, fitting their quantifications, skills, needs, goals, and values. This is vice versa for organizations that sift through

candidates to socialize with the one that fits the firm well. Regardless of the effort and time invested by both parties, a perfect fit rarely finds its way with both parties resorting to suboptimal choices in an everchanging environment (Vogel et al., 2016). This whole idea has been discussed by few influential theories (Edwards & Cooper, 1990; Dawis & Lofquist, 1984; Schneider, 1987; Holland, 1997). The person-environment fit sheds light on the parallel roles of individual and environment in determining decisions referring to career (Oh et al., 2013). The P-E fit theory has two main principles; (i) Person and environment predict human behavior together rather than separately, and (ii) Optimal outcomes occur when P-E factors are compatible (van Vianen, 2018).

Kristof-Brown et al. (2005) as cited in Van vianen (2018) describes two forms of fit; (i) Supplementary i.e., Individual and environment are similar, and (ii) Complementary i.e., individual and other team members are complementary. These two forms are exhibited through different fit concepts such as person-vocation fit, person-job fit, person-organization fit, person-team fit, and person-supervisor fit. The first two concepts fall under complementary form whereas, the next three are supplementary. Having said so, both forms and all concepts do not define a direction of a misfit. Optimal outcomes occur when the highest attributes of an individual fit (subjectively rated) well with the environment. P-E fit theory further posits that a better fit facilitates and eases one's interpersonal interactions (Edwards & Cable 2009), fulfills one need for belongingness (Deci & Ryan, 2000), and relates to attitudinal outcomes (satisfaction, etc.) over behavioral outcomes (turnover, performance, etc.) (Van Vianen et al., 2016).

The classical theories by Knight (1921), Kirzner (1979), and Schumpeter (1943) gave defining characteristics of Entrepreneurs as innovative, perceptive to opportunity, and facing uncertainty. Markman, & Baron (2003) commented on these characteristics about the P-E theory by stating that the higher the scores on the said characteristics, the higher the P-E fit. This understanding fits the preference of entrepreneurs with ADHD-like symptoms due to their perception that venture creation fits their characteristics (Verheul et al., 2015).

This paradigm has influenced the emergence of the Disadvantaged Entrepreneurs theory (DET) (Light, 1979) proposing that those who are not accommodated by the mainstream economy of wage-employment, divert and prefer to be self-employed and own business ventures (Morgan, 2020). Maalaoui et al., (2020) reviewed DET and commented that disadvantaged entrepreneurs appear in all forms and contexts such as minorities, sexual orientations, religion, disabilities, etc.

(Kushnirovich et al., 2017). Pagán (2009) and Dimic & Orlov, (2014) considered ADHD individuals (diagnosed and likelihood) under disadvantaged entrepreneurs.

DET is rooted in the philosophical contributions of Weber (1930) as he proposed that exclusion from mainstream economy resort to self-employment to combat discrimination in the labor market. this self-employment is a response or coping mechanism in face unemployment and/or unhealthy employment (Light and Rosentien, 1995). DET is widely used to explicate *entrepreneurship as an economic survival strategy* among immigrants, and all kinds of minorities (Light and Rosentien, 1995; Light 1979). Hence, in the light of DET, ‘survivalist entrepreneurship’ is referred to as self-employment out of desperation triggered by no options in the mainstream economy. Apart from the survival approach, DET also describes the impeding role of ‘resource constraints such as financial (bank loans, etc.), human (education, vocational training), and social capital (networking). In a nutshell, DET is when minorities (physical, psychological, cultural) are not entertained by the labor market, fail to absorb in the mainstream economy, and face resource disadvantage, they operate in the informal economy as a survival strategy (Smith-Hunter, & Byod, 2004; Light, 1979).

To study such individuals, fewer academicians have focused on the positive impact of negative personal attributes on work preference (Hsieh et al., 2019; Miller, & Brenton-Miller, 2017). Miller & Brenton-Miller (2017) reported summarized various studies showing that entrepreneurs are represented moreover job-doing individuals among the following groups; necessity entrepreneurs (Block & Wagner, 2015), immigrant populations (Hart & Acs, 2011), dyslexic (Logan, 2009) & ADHD populations (Dimic & Orlov, 2014), physically-disabled (Pagan, 2009), veterans returned from war (Hope & Mackin, 2011), and emotionally disinhibited individuals (Lerner, 2016). Based on these findings, Miller & Brenton-Miller (2017) gave a splendid argument that *‘like blind people who compensate with their other senses, immigrants may, for example, compensate for cultural unfamiliarity with hard work and ethnic networking, dyslexics may develop unusual opportunity recognition skills, and those with ADHD may use their surplus energy for multi-tasking and proactive initiatives.’* Hence, logically deducing that these adaptative mechanisms favor entrepreneurship. Wiklund et al., (2016) gave three reasons why ADHD (diagnosed or tendency) prefer entrepreneurship as a career path; (i) Self-employment helps in capitalizing their strengths and minimizing their weaknesses, (ii) In lieu of developing

their full potential, ADHD individuals adhere to different coping mechanisms generally in life, which may bear fruitfully in entrepreneurial endeavors; and (iii) The hereditary neurological differences in ADHD individuals may prove advantageous as genetic variations of dopamine receptors relates to heightened novelty-seeking, creativity, and risk-taking.

## **1.2. Research gap**

Before 2014, ADHD or its likelihood of symptoms was considered ‘unfit’ for various occupational domains (Antshel, 2018). From 2014 to 2017, different researches were carried out to study ADHD and the preferred career stream. These studies in turn led to a by-product finding that diagnosed-ADHD individuals or those with symptoms indicative of ADHD seemed to fit well with entrepreneurship and self-employment (Thurik et al., 2020; 2016; Wiklund, et al., 2016). The research has seen a boom in this field and researchers have tried to test different variables to establish the ground realities of this field (Nicolaou, Phan, & Stephan, 2021; Agafonow, & Perez, 2020; Rietveld, Slob, & Thurik, 2020, Wiklund et al., 2020). Regardless of the amount of studies available, there are only three studies that have focused on ADHD with entrepreneurial orientation. Their results have been inconclusive as Yu, Wiklund, & Perez-Luno, (2021; 2018) reported impulsivity, and hyperactivity due to ADHD are mostly beneficial to firm performance via entrepreneurial orientation whereas inattention showed to be non-significant in the US and Spain. The second study is by Wismans et al., (2020a) that reported no relationship of ADHD to entrepreneurial orientation in France. And the third study was conducted in Japan and reported that ADHD is positively related to entrepreneurial orientation (Wismans et al., 2020b). Hence a study focusing on such a vital concept of ADHD with IEO seems mandatory, that too in a country and culture like Pakistan that is different from the US, Spain, France, and Japan in its economic state as well as perception towards entrepreneurship. Dimic and Orlov (2014) found that having an ADHD diagnosis or high symptom presentation increased the probability to 30% of becoming an entrepreneur. Having said so, Antshel (2018) established how the entrepreneurial field is less studied regarding ADHD and is nascent in its journey of research.

Apart from the research being in its initial phases, individuals with ADHD (diagnosed or symptoms’ likelihood) are linked to increased chances of job dismissal and prefer to work independently (Verheul et al., 2015). Unreliable and anecdotal evidence is seen across the horizon for ADHD and entrepreneurship (The Economist, 2012; Kirby and Honeywood, 2007; Hartmann,

2002). Recent researches have related entrepreneurship (intention, orientation, action) with narcissism (Wales et al., 2013), psychopathy (Akhtar et al., 2013), and Dark triad (narcissism, psychopathy, Machiavellianism) (Hmieleski and Lerner, 2013). Research is now open to investigate how ADHD works with potential entrepreneurial orientation leading to running successful ventures as seen in the case of Ingvar Kamprad (Ikea), Richard Branson (Virgin Group), and David Neeleman (JetBlue), etc., to name a few. In the light of the P-E fit model, the Disadvantaged entrepreneurship theory, and the lack of literature, this research aims at establishing the relationship between ADHD tendency and individual entrepreneurial orientation (IEO) about how it is mediated by impulsivity and entrepreneurial resilience. Furthermore, how ‘hyper focus’ affects the path between predictor and the outcome variable. This will help in understanding entrepreneurship from a genetic perspective (Verheul et al., 2015; van der Loos et al., 2013).

These results will not only add to the international and national literature but will also have practical implications for policymakers (Antshell, 2018). Educators can help ADHD adolescents and adults in selecting a career path fit for their characteristics. Moreover, managers will be able to understand how the limitations of being an ADHD adult can prove advantageous for the company. Furthermore, training firms can shift to project-based learning rather than theoretical learning to facilitate future entrepreneurs with ADHD-like symptoms (Antshell, 2018). Additionally, identifying ADHD tendencies that facilitate entrepreneurial orientation and actions will help in inculcating and utilizing these symptoms as traits in a non-ADHD population.

### **1.3. Research Questions**

Following are the research questions;

1. Is there any relationship between ADHD-like symptoms and Individual Entrepreneurial Orientation among entrepreneurs in Pakistan?
2. What is the mediating effect of Entrepreneurial resilience and Impulsivity on the relationship of ADHD-like symptoms and Individual Entrepreneurial Orientation among entrepreneurs in Pakistan?
3. What is the moderating effect of Hyper-focus on the relationship of ADHD-like symptoms and Individual Entrepreneurial Orientation among entrepreneurs in Pakistan?

#### **1.4. Research Objectives**

Following are the research objectives;

1. To find the relationship between ADHD-like symptoms and Individual Entrepreneurial Orientation in entrepreneurs.
2. To measure the mediating effect of Entrepreneurial resilience and Impulsivity on the relationship of ADHD- like symptoms and Individual Entrepreneurial Orientation in entrepreneurs.
3. To measure the moderating effect of Hyper-focus on the relationship of ADHD-like symptoms and Individual Entrepreneurial Orientation in entrepreneurs.



## Chapter 2

### Literature Review

The literature is scarce and far from being developed, even though the psychological tendencies such as Attention-deficit Hyperactive disorder (ADHD) or its likelihood symptoms or tendency, may have positive implications (Wiklund, Patzelt, and Dimov, 2016). The increased rates and elevated trend of self-employment (Verheul et al., 2016), the higher exhibition of entrepreneurial orientations (Verheul et al., 2015), and the positive relation of ADHD (Thurik et al., 2020; 2016) it has been discussed but with zero to no insights into its factors.

#### 2.1. Entrepreneurship

The scope of entrepreneurship has been defined and understood from different angles and perspectives. Some scholars have focused entirely on newness and novelty in products, processes, and/or markets, creation (Smith & Di Gregorio, 2002; Daily, McDougall, Covin, et al., 2002; Sharma & Chrisman, 1999; Lumpkin & Dess, 1996), whereas some scholars relate it to discovery and exploitation of opportunity for wealth creation (Ireland, Hitt, & Sermon, 2003; Shane and Venkataraman, 2000). The agreement between both these viewpoints suggests that opportunity sensing and recognition along with advantage seeking is at the heart of entrepreneurship (Brown & Eisenhardt, 2000; McCline, Bhat & Baj, 2000). Over a decade ago, Shane & Venkataram (2000) described the true essence of entrepreneurship in 3 points; “(1) why, when, and how opportunities for the creation of goods and services come into existence; (2) why, when, and how some people and not others discover and exploit these opportunities; and (3) why, when, and how different modes of action are used to exploit entrepreneurial opportunities” (Shane & Venkataram, 2000, pg 218). The second postulate corresponds to the fact that an individual’s capability, traits and behaviors play a vital role in orienting one to entrepreneurship (Hitt, Ireland, Camp, et al., 2001). This postulate acts as the bases for the idea that cognitive tendencies like ADHD may have a role to play in ones IEO.

#### 2.2. Theories of entrepreneurship

##### 2.2.1 Classical theories

The works of Weber, Schumpeter, and Knight are considered as the foundational pillars of the study of entrepreneurship. These three authors gave their own theory and were also aware of the works of each other. Their ideas differ on some concepts and differ on others, but to understand entrepreneurship, these three remain crucial to address. Their theories and ideas constitute the debate on what motivates and effects entrepreneurship. Weber held the view that Calvinist parsimony would finance investment, whereas both Schumpeter and Knight considered external finance the main source of entrepreneurial investment (Brouwer, 2002).

**2.2.1.1 Weber's View.** Weber intended to look for the reason behind rapid growth of western capitalism. He took the route through the life of the Calvinist Puritan. This group of religious sects favored and incorporated rationality in all their matters as they considered their life to be chosen for a purpose. This rationality was included in business matters as material success acted as a proof of being one of the chosen. Additionally, those who found no route for social and financial advancement through the popular or accepted professions of bureaucracy, and army, opted to get self-employed because that is what rationality suggests. His view fitted the society where laborers were free with no masters to work for. This theory is not directly linked to entrepreneurship but it applied explicitly to businessmen, laborer, and professionals involved. Many puritans took up entrepreneurship as a way to earn, due to the social barriers they faced because of being a religious minority (Schilpzand, & de Jong, 2021; Harvey, Kiessling, & Moeller, 2010).

**2.2.1.2 Schumpeter's View.** Schumpeter gave his famous and most sought-after model of dynamic economy in 1920 under the title '*Theorie der Wirtschaftlichen Entwicklung*'. He built his theory on the foundation 'the actual activity of the entrepreneur' whether an individual or a firm. He reputed Weber's theoretical postulate of the effect of Calvinist attitude for economic development. Schumpeter proposed that an entrepreneur is defined as a founder and an innovator who opposed the working of economic development. In order to sustain the venture, an entrepreneur needs to take opposition as a favorable condition and withstand the environment that considers deviant behavior as a problem, rather than novelty. His definition of an entrepreneur is creative, religious dissident, non-conformist, and welcomed warmly by the banking community to invest and fund. Schumpeter presumes that bankers must have a foresight to discern only successful entrepreneurs. He gave the idea of circular flow, also known as stationary economy.

Economic processes are repeated period after period without change, prices and quantities do not vary, can be completely deduced from the data, the interest rate is equal to zero, and net investments are absent in the circular flow. The entrepreneurs break this circular flow and steer economy to newer possibilities through innovation. He also gave the idea that established firms either do not accept innovation or wait for the old assets to become obsolete before innovating for newer things. It's the new firms that endorse innovation, but on contrary may face creative destruction. His theory further presumes that all entrepreneurs can be ranked unambiguously according to their profitability i.e., Entrepreneurial income reflects entrepreneurial quality (Samuelson, 2014). Furthermore, he identified 5 entrepreneurial behaviors and 3 entrepreneurial drivers. Former include (i) the introduction of a new good, (ii) the introduction of a new method of production, (iii) the opening of a new market, (iv) the conquest of a new source of supply of raw material, and (v) the creation of a new organization of an industry. Whereas latter include (i) the will for power and independence, (ii) the aim to triumph, and (iii) the happiness of creating (Dorin, & Alexandru, 2014).

**2.2.1.3 Knight's view.** Knight was on the same page as Schumpeter on the idea of capital deepening, and innovation. He commented that the length of life of capital goods is a matter of choice and can never be a source of profits. Whereas Knight differed on the concept of entrepreneurial motivation. This motivation is fueled by the desire to excel, invent the biggest and fascinating innovations. And winning the market. this motivation derives his theory of entrepreneurial profits (and losses) where he distinctly differed from Schumpeter who only rook successful entrepreneurs, whereas Knight described the process of selection problems. He contended that only uncertainty could explain profits, and losses. Uncertainty needs to be sharply distinguished from risk in Knight's view. Risk is calculable a priori and can, therefore, be treated as a cost. Uncertainty, in contrast, is uninsurable. The major difference is the possibility of making *ex ante* calculations of the incidence of an event. That can be done for fires, but not with respect to the outcomes of investment projects that can only be calculated after everything is said and done. Hence considering investments as a discovery process. Lastly Knight also discussed one's perceptiveness. He commented that investors with above average perceptiveness world earn profits through a success of venture, whereas those with below average perceptiveness will lose money. Perceptiveness refers both to project choice and to the timing of investment (Mousavi, & Gigerenzer, 2014; Knight, 2013).

The classical theories by Weber, Schumpeter, and Knight gave defining characteristics of Entrepreneurs as innovative, perceptive to opportunity, and facing uncertainty. These characteristics are in line with the definition of Individual entrepreneurial orientation. Moreover, DET is also rooted in the philosophical contributions of Weber (1930) as he proposed that exclusion from mainstream economy resort to self-employment to combat discrimination in the labor market.

### **2.2.2. Trait View**

Entrepreneurship and psychology have remained as parallel disciplines across scholarly work and the role of traits have been rigorously supported to effect entrepreneurship. Shaver (2003) sorted the entrepreneurship psychology literature into five categories; personality, cognition, emotion, attitude, and self. The trait theory falls in the personality section.

The personality research is vast and wide but it never seems to saturate. Common traits identified are self-reliance, autonomy, competitive aggressiveness, proactivity, achievement orientation, internal locus of control, risk taking, and Big five attributes (Openness to experience, extraversion, agreeableness, conscientiousness, neuroticism). Most of these are traits are focused in relevance to firm's growth at entrepreneurial level or one's own capacity to sustain in entrepreneurial culture (Omored, Thorgren, & Wincent, 2015).

For instance, McClelland (1965) gave his theory of achievement motivation which has been extensively used in human resource and entrepreneurship literature. It commented that an entrepreneur's trait of high need for achievement is a vital determinant of a firm's performance and success. Following the same lines Wainer and Rubin (1969) related this need for achievement trait to power and affiliation and concluded that entrepreneurs who have a high need for achievement combined with a moderate need for power are likely to be successful.

Another approach on trait perspective is by Walker (1986) who proposed that the true entrepreneur is one who is endowed with more than average capacities in the task of organizing and coordinating the various factors of production, and is a pioneer of an industry. One's level of organizational skills and capability determine an efficient entrepreneur that leads to true profit ascribable to superior talent.

Propensity to risk taking, tolerating ambiguity, and internal locus of control are considered a must to start and run a business venture (Wincent and Örtqvist, 2009; Ardichvili et al. 2003; Stewart et al. 1999; Begley and Boyd 1987; Brockhaus 1980). Whereas the infamous big five personality traits were incorporated by Zhao and Seibert (2006) through their meta-analytical review by differentiating managers and entrepreneurs. Findings report that apart from extraversion, entrepreneurs differ on all 4 traits. In the same area, Muller & Gappisch (2005) gave 5 types of entrepreneurs; controlled preserver, rational manager, distant achiever, creative acquirer, and egocentric agitator. These types effect the entrepreneur's job and life satisfaction. Brandstater (2011) also applied the big five model, aiming to predict entrepreneurial intentions and performance. He concluded that proactiveness and risk tolerance help in opportunity recognition. Similarly, Fairlie and Holleran (2012) reported that risk propensity and autonomy help in better entrepreneurial learning.

### **2.2.3. Process view**

There is extensive literature talking on the process view of entrepreneurship but one consistent viewpoint is of effectuation. Effectuation is a theoretical lens or framework that describes how expert entrepreneurs utilize the resources within their control in conjunction with commitments and constraints from self-selected stakeholders to fabricate new artifacts such as ventures, products, opportunities, and markets (Schweizer, Vahlne, & Johanson, 2010; Mainela & Puhakka, 2009). Most of the work highlight that expert use a set effectuation heuristic (Wiltbank, Read, Dew, & Sarasvathy, 2009; Read, Song, & Smit, 2009; Sarasvathy & Dew, 2005), along with empirical measures of effectuation (Brettel, Mauer, Engelen, & Kuepper, 2012; Chandler, DeTienne, McKelvie, & Mumford, 2011) and its effects on firm performance (Fischer & Reuber, 2011; Read et al., 2009).

Sara Sarasvathy in 2001 gave the theory of effectuation and described an approach to decide and perform actions in entrepreneurial process, based on the assessment of resources to available and the outcomes required. Effectuation differs from causality as casual logic has a predetermined goal with a carefully planned process based on resources. This does not work for entrepreneurs as entrepreneurial process is full of uncertainties and risks.

The fundamental postulate of effectuation is termed as 'Pilot-in-the-place' that asserts future opportunities are or can be treated by the entrepreneur (Sarasvathy, Menon, & Kuechle,

2013; Wiltbank, Dew, Read, & Sarasvathy, 2006; Sarasvathy, 2001). This postulate pans into four principles; (i) Bird-in-hand: You have to create solutions with the resources available here and now; (ii) Lemonade principle: Mistakes and surprises are inevitable and can be used to look for new opportunities, (iii) Crazy Quilt: Entering into new partnerships can bring the project new funds and new directions, and (iv) Affordable loss: You should only invest as much as you are willing to lose. In crux, effectuation teaches to build adequate conditions for success, given whatever conditions already exists. It's the act of bringing things to action and making (Sarasvathy, Kumar, York, & Bhagavatula, 2014).

#### **2.2.4. Resource based view**

The resource-based view is based on 4 theoretical sources; Distinctive competencies' study, Penrosian economics, Ricardian economics, and the Anti-trust implications of economics (Barney & Arikan, 2001). All these resources prompted the RBV that looks at how resources are employed by the firm strategically, that showcases the difference of performance among firms. (Michael, Storey & Thomas, 2002; Mosakowski, 2002; Alvarez & Barney, 2002; Barney & Arikan, 2001).

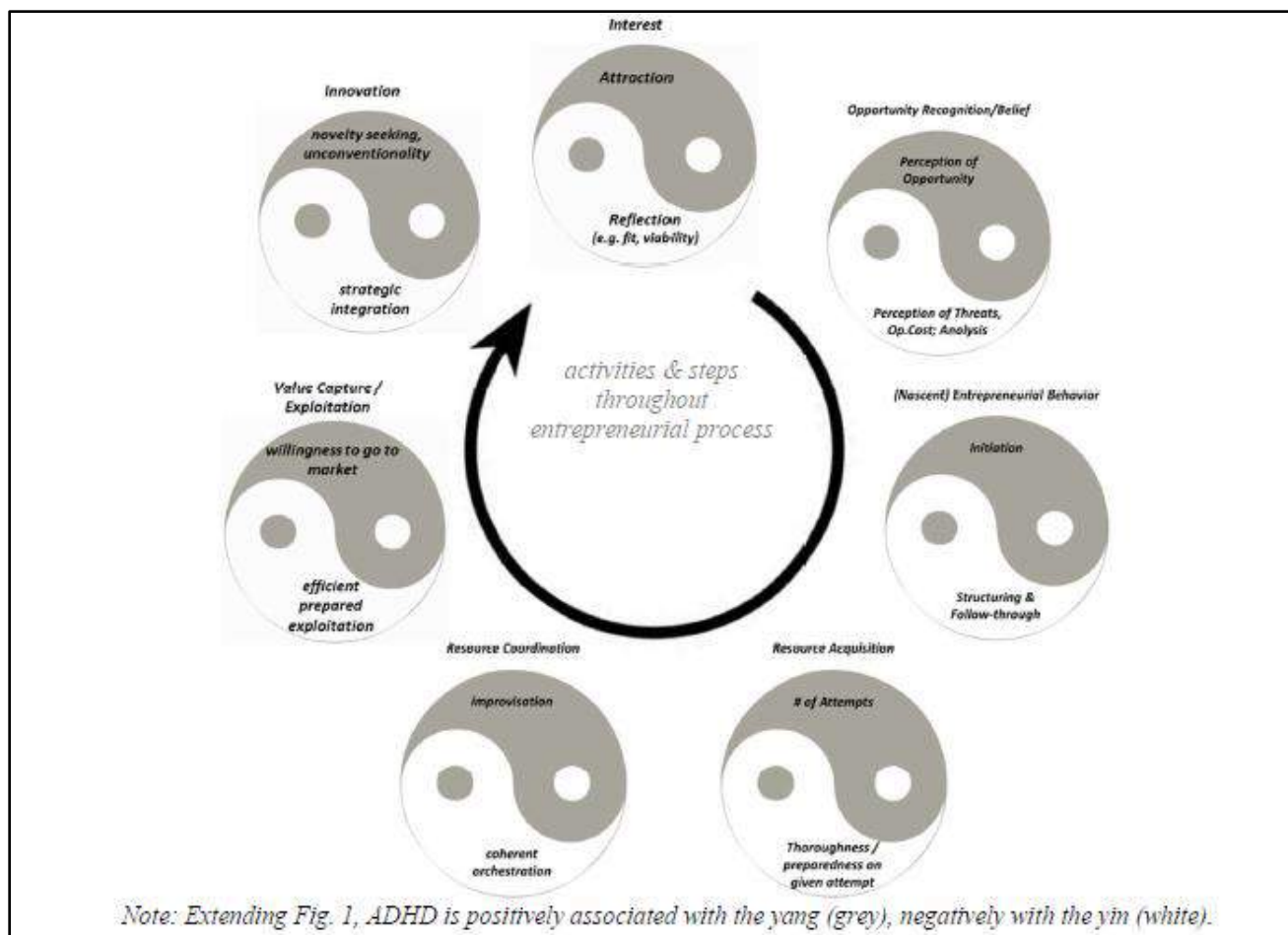
The RBV theory is based on two assumptions; (i) Competing firms may own different types of resources – resource heterogeneity; and (ii) Owning different types of resources by firms may persist differently – resource immobility (Barney & Arikan, 2001; Priem & Butler, 2001a). Resources are defined as 'tangible and intangible assets a firm uses to choose and implement its strategies' (Barney, 2001; Barney and Arikan, 2001; Hitt & Ireland, 1986). Competitive advantage of being efficient and effective depends on rare and valuable resources. This rarity and valuation depend on resources ability to being imperfectly imitability and non-transferability (Priem & Butler, 2001). These resources include financial, social, and human, managed strategically through three steps; structuring the portfolio, bundling the resources, and leveraging capabilities (Ireland, Hitt, & Sermon, 2003).

The whole process of RBV is partially sequentially as it incorporates a temporal dimension as well as feedback loops allowing adaptations' continuously. The firm must have resources to bundle into capabilities which in turn have to exist to be leveraged. Regardless of the whole process or types of resources, the firm's resource management capability can produce various outcomes, even if two or more organizations have same resources (Sirmon, Hitt, & Ireland, 2007; Zott, 2003).

### 2.3. Emerging literature on Disadvantaged Entrepreneurs

Back in the 1900s, Mannuzza et al., (1993) had established that ADHD symptoms lead to far more chances of job dismissal and rejection, about achieving significant positions in a firm. This difficulty to gain a prestigious position corresponds to the ADHD individuals' absenteeism, inability to meet workload demands, and susceptibility to mistakes (Kessler et al., 2006). Moreover, the need to work autonomously over teamwork, adds to job instability (Painter et al., 2008). Simultaneously, these individuals turn out to be an annual burden to the firm as they require more sophisticated health benefits and absences (Hodgkins et al., 2011). Contrarily, few studies suggest that ADHD individuals have creative personalities (White, & Shah, 2011), with inattention prompting imagination (White, 1999), and hyperactivity propelling multitasking (Boot, Nevicka, & Baas, 2017). This inability to work in the mainstream economy and the similarity of the symptoms to an entrepreneurial profile (Verheul et al., 2015), instigated with the active work environment and risk-taking, ADHD is a tailor-made P-E fit for entrepreneurship (Antshel, 2018).

Hayward, Forster, Sarasvathy, & Fredrickson, (2010) and Klotz & Neubaum (2015) proposed in his paper that early experiences, schooling, and childhood upbringing play substantive role in developing or under developing traits like risk-taking, confidence, persistence, etc. that engenders or suppresses entrepreneurial courage. Based on this proposition, war veterans and handicapped are considered as better entrepreneurs due to their ability to look at risk through a proper perspective (Miller, & Le Breton–Miller, 2017a). Specifically, the handicapped category with different mental capacities, ADHD has been deemed to having a potentially positive influence on the field of entrepreneurship as it relates with entrepreneurial orientation, creativity, and new venture creation. Lerner, Hunt, & Verheul (2018) gave their Tao model, where yang is positively linked and yin is negatively linked (Figure 1). The nature of ADHD and the complementary dualities of the Tao can be considered in a contextually dynamic fashion. Each step of the entrepreneurial lifecycle can be considered as a distinctive person-environment context against which fit must be evaluated.

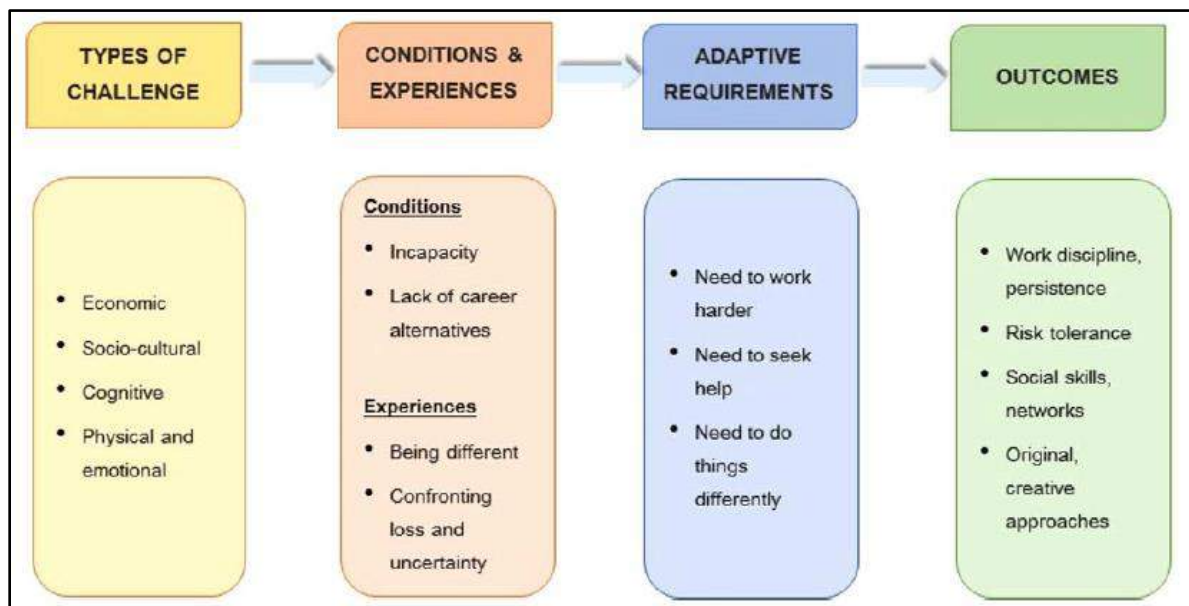


**Figure 1.** Dualism of ADHD across Entrepreneurial Lifecycle (Adopted from Lerner, Hunt, & Verheul, 2018).

Most of the literature considered entrepreneurs as a homogenous group but Fischer, (1993) pointed out that entrepreneurs may differ due to their female gender due to overt discrimination and/or to systemic factors that deprive them of vital resources like business education and experience. Initial works have highlighted that Disadvantaged entrepreneurs incorporate a range of individuals (Maâlaoui, Ratten, Carsrud, et al., 2021) that vary depending on their socio-demographic characteristics such as young people and students (Krueger, Reilly and Carsrud, 2000), women (Marlow, 2014), seniors (Maâlaoui, et al. 2013, Kautonen et al. 2011), unemployed, immigrants (Aliaga-Isla and Rialp, 2013), ethnic minorities (Carter et Al, 2015; Dana, 2007; Zhou, 2004), immigrants (Kushnirovich, Heilbrunn, & Davidovich, 2018), ex-prisoners (Cooney, 2012), disabled people including those with developmental challenges (Dimic and Orlov, 2014; Logan, 2009; Pagán, 2009), and refugee entrepreneurs (De Clercq and Honig, 2011). Miller, and Breton-



Miller (2017b) gave the challenge-based model of entrepreneurship classifying disadvantaged entrepreneurs on the type of challenges; economic, cognitive, sociocultural, emotional, and physical, which lead to different conditions and experiences with adaptive requirements and outcomes. In the light of DET, ADHD individuals have a cognitive challenge at the primary level with economic, socio-cultural, and physical and emotional as secondary challenges. These challenges give rise to the condition of lack of career alternatives and the experience of being different. This led to the adaptive requirement of needing to work differently, with the outcomes of risk tolerance and original creative approaches (Figure 2).



**Figure 2.** A Model of Challenge-Based Entrepreneurship (Adopted from Miller, & Miller, 2017)

A study conducted by Naseer, Kakakhel, & Shah, (2020) in the context of Pakistan explored the challenges transgenders faced to launch an entrepreneurial venture. They concluded that stigmatization of non-binary gender identity leads to difficulty in connecting with the community, demonstrating a healthy attitude towards society, sense of resilience, and uplifted self-esteem. The challenges of earlier life provide self-help mechanisms to cope at individual level and aids in developing entrepreneurial ventures. This is inline with the challenge-based model discussed above as the type of challenge is physical and socio-cultural. On the contrary a study conducted by Metzler, (2020) in Germany concluded that Germany is an exception as a disability indicates a significant negative influence on the chance of an individual of being self-employed. Moreover, the likelihood of entering entrepreneurship is mainly determined by “health”, while the

likelihood of leaving “entrepreneurship” is determined by “disability”. The results show that “disability” and “health” cannot be used synonymously but have their own effect on entrepreneurs in Germany. Salamanca & Alcaraz (2019) revealed that the reason behind escalation of migration of Mexican entrepreneurs is the Mexico's institutional weaknesses, such as insecurity, corruption, and bureaucracy, as well as the perception of a friendly U.S. fiscal system, the search for a better quality of life, and the appeal of a more transparent business environment. Trina (2018) found that Blacks have less managerial experience, more motivation to start own business, less financial success, and more persistence than whites. Mangum (2020) studied the factors associated with market conditions that may play a causal role in choosing entrepreneurship. He concluded that low black labor demand, persistent high black unemployment, and barriers due to political economy led to frequent Black entrepreneurs emerging in market. Kim, Lee, Brown, & Earle, (2021) further studied the Black-owned businesses and concluded that Black entrepreneurs tend to operate with less finance and employ fewer workers than those owned by White entrepreneurs. This is due to the less likelihood to receive bank loans, more likely to refrain from applying, and expecting denial. Lugo, & Shelton, (2021) studied the difficulties faced by the black and Hispanic women. Although these women are 32% in US, they own 44% of the women-owned businesses. This is due to their developed resilience throughout their life as they faced ‘double jeopardy’ of being black and Hispanic.

Most recently, Harms, Hatak, & Chang, (2019) took a different route to study the field of disadvantaged entrepreneurship and studied the dominant ‘superhero’ personality perspective by arguing that, in entrepreneurship, highly sensitive persons can attend to their own needs and skills, and turn their weaknesses into strengths. They found that the combinations of either Sensory processing sensitivity or entrepreneurial trait profile and opportunity recognition ability are sufficient conditions for Entrepreneurial intention. This result contributes by reconsidering of the stereotypical view of extrovert and open entrepreneurs and acknowledging the strength of a ‘weak’ trait. Moreover Miller, Wiklund, & Yu, (2020) discussed the effect of differently abled mental health with family businesses and discussed how it effects one’s entrepreneurial journey. They combined the ABCX model and proposed that (A) Mental health is the stressful event; (B) Socioemotional wealth resources available to the family; (C) Socioemotional wealth aggravating stressors, and (X) Family outcomes including family business as a whole, family as a unit, and individual themselves. Another work by Greidanus, & Liao (2021) proposed the ‘Coping-

dueling-fit theory' that takes the biological basis of dueling symptoms and the P-E fit paradigm together. It posits that ADHD symptomology may be a liability or an asset for entrepreneurship. This theory opens an all-new side of research in this area but their study reports that treatment towards ADHD is a key factor in the relationship between ADHD and business venturing, persistence, and performance. Mota, Marques, & Sacramento, (2020) reported a systematic literature review and summarized the literature into four areas; (i) entrepreneurs with disabilities, (ii) self-employment as an alternative to unemployment for people with disabilities, (iii) barriers faced by disabled entrepreneurs, and (iv) the importance of education, training and/or orientation for these individuals' entrepreneurship. This will help academics to direct future research, and policymakers in stimulating entrepreneurship education.

#### **2.4 Individual Entrepreneurial Orientation (IEO) and Attention-deficit Hyperactivity Disorder Tendency (ADHD)**

American Psychiatric Association (2013) defined ADHD as a neurodevelopmental disorder and one of the most commonly diagnosed disorders among children, at a prevalence rate of 5.3%, out of which 2.5-3% exhibit symptoms in Adulthood. Although the name 'ADHD' is self-explanatory, the disorder or its tendency affects one's executive functions too (Ashinoff, & Abukhel, 2015; Roberts, Martel, & Nigg, 2017).

According to DSM-V, "*People with ADHD show a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development*" (American Psychiatric Association's Diagnostic and Statistical Manual, Fifth edition). Symptomology defines the type of ADHD dominant in an individual, either combined presentation, predominantly inattentive presentation, or predominantly hyperactive-impulsive presentation (Appendix A). During initial years, ADHD was associated with children only but this changed nearly 25 years back when evidence accumulated around Adult ADHD as symptoms being persisted in adulthood, approximately in 50-70% of the said population (Biederman et al., 2010).

Mirroring the concept of Janus's face (positive attributes having negative effects and vice versa), Miller (2015) established that ADHD connotated to 'negative' in literature before, may seem positive for entrepreneurship. ADHD can be explained through a dual pathway model of dopaminergic pathways in the brain (Sonuga-Barke, 2003; 2002). If ADHD is considered a disorder or tendency, it corresponds to poor inhibitory control in the mesocortical branch (pre-

frontal cortex) of the dopamine system leading to dysregulation of action and thought. Whereas if ADHD is considered a motivational style, it is associated with reward circuits in the mesolimbic (nucleus accumbent) dopamine branch, leading to altered delay of reward gradient. This was further elaborated with external factors which are; (i) Environmental pounding i.e., how constraints related to ADHD limit opportunities for learning leading to intensified motivation, and (ii) Compensatory processes i.e., how these constraints stimulate skills and strategies to improve functioning (Sonuga-Barke, 2002). With no definite cause of ADHD found in literature, it is consistently dubbed as a neurobiological and genetics-based disorder (Mathis et al. 2014). Around 60-75% of cases are genetically predisposed (Cortese, 2012). Having said so, most of the work constitutes on children, with a considerable lack of studies for adults with ADHD, although the symptoms persist in adulthood (Saviouk et al., 2011).

Studies have established that ADHD tendency leads to substandard and below-average job performance (Halbesleben et al., 2013) with increased chances of firing, quitting, and unemployment (Barkley et al., 2006, as cited in Verheul et al., 2015). This leads to the natural shift towards entrepreneurship and self-employment among ADHD individuals. The driving force of any entrepreneurial pursuit is the individual entrepreneurial orientation (IEO) for the last 30 years of long research (Covin, & Wales, 2011). IEO is a conceptual idea defining ‘being entrepreneurial’ (Sônego et al., 2020; Covin, & Slevin, 1998). This multidimensional domain of IEO stems from three constructs; innovativeness, risk-taking, and proactiveness (Miller, 1983). Entrepreneurial orientation covers aspects of an entrepreneur’s entrepreneurial profile and performance, measuring the dimensions of risk-taking, innovativeness, and proactivity. The risk-taking dimension assesses the willingness to step up in times of risks, venturing into times of unknown. The dimension of Innovativeness covers the predisposition of experimentation in products and services. Whereas, proactivity is characterized by the pursuit of opportunities by sensing future demands and acting upon them (Van Gelderen, Kautonen, & Fink, 2015; Dimic and Orlov, 2014; Boltan, 2012). It is worth mentioning here the difference between intention and orientation, i.e., intent is defined as ‘*a state of mind which potentially fosters entrepreneurial action/behaviors in individual*’ (Hattab, 2014)’, whereas orientation differs from intent as ‘orientation is exist at individual, firm and national level, encompasses those attributes that stimulate entrepreneurial propensities’ (Ismail et al., 2015; Wickramaratne, Kiminami & Yagi, 2014). The current study focuses on IEO as defined by (Boltan, 2012) and operationalizes it as an umbrella term that not only evaluates an individual’s

entrepreneurial characteristics but also covers entrepreneurial intent, profile, and performance (Thurik et al., 2020; 2016; Boltan, 2012).

ADHD has been related to occupational selection and performance therein, as Verheul et al., (2015) reported that over 10,000 students with the behavioral tendency of ADHD were more inclined towards entrepreneurial intentions. Antshell (2018) further states that these traits are what constitutes IEO, hence, establishing that adults with ADHD are likely to incline towards entrepreneurship. Both Verheul et al., (2015) and Antshel (2018) explicitly established that studies have focused on pathological effects of ADHD as a disorder but the perspective should shift to positive behaviors as studies showed that those who were not screened positive for ADHD diagnoses clinically, but exhibited such tendencies, showed good P-E fit with self-employment over wage-employment. This certainly does not guarantee a good entrepreneurial career path but a higher inclination towards entrepreneurship. Dimic, & Orlov (2014) were one of the first to conduct a study on the predisposition of entrepreneurial tendencies in individuals exhibiting ADHD tendency. They used DET as their lens and suggested future studies to do same, instead of any other theory as DET is domain specific to entrepreneurship. They reported that there was higher probability to become entrepreneur in those who manifested symptoms of ADHD, while maintaining demographic controls (Dimic, & Orlov, 2014).

Based on the biological basis and defining characteristics of IEO, Lasky et al., (2016) gave the idea that ADHD (diagnosed or symptoms) flourish in “highly stimulating” environments. These environments are operationalized as; (a) Novel & multitasking during stressful work, (b) fast-paced work environments, (c) Project-based (hands-on) work, and/or (d) work requiring intrinsic motivation (Lasky et al., 2016). This conforms with ADHD individuals as increased creativity, multi-tasking, risk-taking, and novelty-seeking are characteristic of ADHD individuals (Paek, Abdulla, & Cramond, 2016; Fleischmann & Fleischmann, 2012). Barkley (1997) drew a conclusion based on evidence that the ‘deficiency’ an ADHD individual faces, triggers ‘under arousal, making the individual seek extreme and risk-taking activities. Verheul et al., (2015) suggest that risk-taking tendency mediates the elevated entrepreneurial intentions in ADHD individuals. White and Shah (2011; 2006) determined that ADHD tendency facilitates divergent thinking, giving rise to far more original ideas. Hence relating to the innovative and proactive components of IEO. Thurik et al., (2020; 2016) conducted a study in France on small business

owners suggesting a positive relationship between ADHD symptomology and IEO. Lerner, Verheul, & Thurik (2019) did a cross-sectional study with students, reporting that higher ADHD-like behaviors increase the chances of starting business ventures.

The direct literature is scarce and inconclusive with no mention of any specific theory as basis for the works. Verheul et al., (2016) reported a positive relationship between self-employment and hyperactivity whereas, a negative relation between inattentiveness and self-employment. Yu, Wiklund, & Perez-Luno, (2021; 2018) reported impulsivity, and hyperactivity due to ADHD are mostly beneficial to firm performance via entrepreneurial orientation whereas inattention showed to be non-significant in the US and Spain. Another study conducted across France, Italy, and Spain by Cantis et al., (2019) found a negative relation between inattention and entrepreneurial characteristics, along with no relation between hyperactivity and entrepreneurship. Wismans et al., (2020a) that reported no relationship of ADHD to entrepreneurial orientation in France. And a study was conducted in Japan and reported that ADHD is positively related to entrepreneurial orientation (Wismans et al., 2020b).

**H1:** ADHD tendency will have an effect on IEO among entrepreneurs.

**H1a.** ADHD tendency will have a positive effect on Risk-taking behavior among entrepreneurs within IEO.

**H1b.** ADHD tendency will have an effect on Innovativeness among entrepreneurs within IEO.

**H1c.** ADHD tendency will have an effect on Proactiveness among entrepreneurs among IEO.

## **2.5 Mediating Effect of Impulsivity and Entrepreneurial Resilience**

Historically, ADHD-like behaviors are considered ‘deficiencies’ with the characteristic of inattention, hyperactivity, and especially impulsivity, making it difficult for an individual to survive and prosper in job-setting (Barkley, & Murphy, 2010). This impulsive tendency is significantly correlated with hyperactivity, so much that it is considered a pseudo-symptom of ADHD diagnosis (Sorenso et al., 2017). Impulsivity as defined by McMullen, & Shepherd (2006) is “*action under uncertainty*” which is core to entrepreneurial actions. The theory of ‘functional impulsivity’ in entrepreneurship literature has the same connotational meaning (Lawrence et al., 2008) as it proposes that those seeking self-employment have an exemplary risk-taking yet

adaptive tendency, associated with impulsivity's evolutionary value of seizing opportunities and positive functional outcomes.

Verheul et al., (2015) explained that the impulsive tendency of an individual with ADHD-like tendency makes them susceptible to risk-offending their managers or leaders in the work environment. This stems from the lower behavioral inhibitory system that propels their lack of attention and the uncertainty in action. This lack in the behavioral inhibition system impairs executive functions such as self-regulation of affect-motivation-arousal, working memory, reconstitution, and internalization of speech. He (Verheul et al., 2015) further validates Mannuzza et al., (1993) who proposed that even if an ADHD-like individual could work in wage employment, they would prefer and lean towards self-employment as means to satisfy self-determination. Toner O'Donoghue, & Houghton, (2006) summed this behavior in his work as '*Their strong strive to maintain control to counteract an often-chaotic lifestyle contribute to their preference for a work environment that allows and promotes independent behavior*'. Hence it can be commented that may it be sheer preference or necessity arising from biological 'shortcomings, ADHD individuals opt for an entrepreneurial career. Having said so, there is no literature to confirm whether ADHD tendency is pull or push factor.

Impatience, fueled by hyperactivity and leading to impulsivity, is the main antecedent for newer experiences and opportunistic tendency at work (van Gelderen et al., 2015). Wiklund, Patzelt, & Dimov (2016) proposed a model inferring that entrepreneurial orientation is linked to impulsivity. They conducted a case study analysis on 14 entrepreneurs who were diagnosed with ADHD and stated that impulsivity and hyperactivity proved to be great advantages in entrepreneurial endeavors as individuals can adapt and adjust their energy levels. Interestingly, few of the participants became entrepreneurs as a consequence of impulsivity as they felt boredom and delay in rewards in their previous jobs. This impulsive tendency further perpetuates the higher work capacity and lesser need for sleep as compared to non-ADHD individuals.

**H2:** Impulsivity mediates the relationship between ADHD tendency and IEO among entrepreneurs.

Entrepreneurial resilience (ER) plays an important role in the attitude towards venturing as a career field. Buang (2012) specified the term for the first-time cross fields from psychology to management, defined as "*the ability to cope well with high levels of on-going disruptive change of*

*the surroundings towards business by bouncing back with acceptable means to overcome business adversities while sustaining good health and energy*". Denz-Penhey, & Murdoch, (2008) termed ER as a driver of entrepreneurial success as those individuals with higher ER, welcome change, and have a high tolerance for ambiguity. Morisse, & Ingram, (2016) comments that entrepreneurs use ER to manage an unstable and changing business environment. Strong conviction in entrepreneurial resilience leads to IEO, hence leading to venture creation at the individual level (Uygur and Kim, 2016).

Bozionelos and Bozionelos (2013) found that behaviors associated with ADHD-like individuals develop such coping mechanisms and exhibit greater resilience that outperforms the abilities of non-ADHD symptoms in the creative work environment (Wilmshurst, Peele, & Wilmshurst, 2011), and is related to entrepreneurship (Holland and Shepherd, 2013; Patel and Thatcher 2014; van Gelderen, 2012). This coping behavior is explained through the low inhibitory system at a biological level. Due to less behavioral inhibition, ADHD-like individuals face several adverse events such as social disconnection, low grades at school, unemployment, firing, etc. Although adversity is seen negatively across decades of literature, recently moderate adversity has proven to foster and nurture resilience, consequently better well-being (Seery et al. 2010; Seery, et al. 2013). These adversities incubate resilience in individuals with ADHD tendency from an early age leading to success in the face of substantial odds (Wilmshurst et al. 2011). This early age development shows its effects in adulthood, by exhibiting resilience to significant disappointments and 'bouncing back from stressful situations. This is not only common and advantageous for individuals with ADHD, rather it is a prerequisite for entrepreneurship, useful in scenarios of resource constraints and risks (Young, 2005; Markman et al., 2005 as cited in Verheul et al., 2015).

**H3:** ER mediates the relationship between ADHD tendency and IEO among entrepreneurs.

## **2.6 Role of Hyper-focus**

The literature has so far failed to define an ostensibly self-explanatory construct, hyper-focus (HF). Across the academic writings, HF is under and/or poorly defined with a presumption that the '*reader knows what it entails*' (Ashinoff, & Abu-khel, 2019). Despite the lack of consensus over what hyper-focus is, the following criteria fit the general understanding of the said construct; (i) Characteristic of intense state of concentration, (ii) Diminished perception of the unrelated external stimuli, (iii) HF requires an interest in the task, and (iv) Task performance elevates with



HF (Ashinoff, & Abu-khel, 2019). Based on this broad understanding, two definitions clarify HF the best to understand. *‘Hyper focusing is characterized by an intensive concentration on interesting and non-routine activities accompanied by temporarily diminished perception of the environment as defined by Ozel-Kizil et al., (2013, 2016). Whereas, Ashinoff, & Abu-khel (2019) defined HF as “a phenomenon that reflects one’s complete absorption in a task, to a point where a person appears to completely ignore or ‘tune out’ everything else.”*

Among the limited literature on HF, Hyper-focus with ADHD has been rarely studied. Hyper-focus was initially defined as a clinical construct of *“locking on”* a specific task among the ADHD population (Conner, 1994). Whereas, Brown (2005) resembled HF to a ‘hypnotic spell’ as reported by ADHD subjects. Sklar (2013) defined HF across the same idea, stating that individuals with ADHD may feel controlled by a non-routine and interesting task, over a span of time, making their perception diminished to their environment. Apart from diminished perception, heightened attention is also reported among ADHD individuals (Ozel-Kizil et al., 2016; 2013). The individual may have trouble or may require a conscious effort to shift attention from one interesting stimulus to the external stimuli present (Hupfeld et al., 2019).

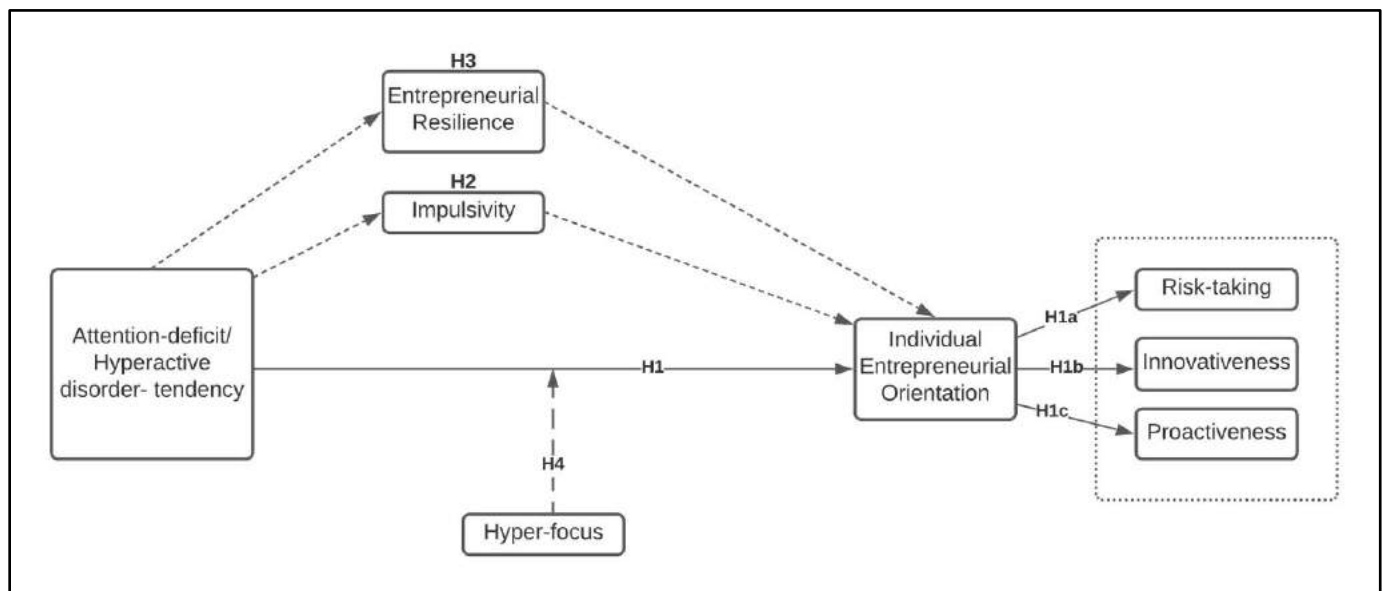
This under-definition may be due to the use of different terminologies meaning the same exhibition of behavior as seen with HF. These connotational terms include ‘flow’ and ‘in the zone.’ Flow has been defined as the *‘a state of intense concentration with the loss of reflective self-consciousness* and has been studied for neural correlates (Dietrich, 2004). Whereas, the zone has been defined as *a state with reduced variability in task performance with sustained attention* (Esterman, Rosenberg, & Noonan, 2014; Esterman et al., 2013). However, the processes underlying HF, flow, and in the zone, may or may not be the same as literature is silent over this till date (Kucyi et al., 2017; Fortenbaugh et al., 2015). Apart from different terminologies, Sklar (2013) criticized the methodological lack for studying HF as it is near to impossible to manipulate and replicate the state of HF experimentally.

DSM-V does not use the term HF as a symptom for ADHD but states *‘the child often does not seem to listen when spoken to’*. Moreover, the academic literature pervasively associates HF with ADHD as individuals exhibit intense concentration and absorption in the tasks of their interests (Sklar, 2013; Ozel-Kizil et al., 2013; Schecklmann et al., 2008). Similarly, Goodwin and Oberacker, (2011) and Travis (2010) asserted that hyperactivity and inattention is the poster

symptom and antithetical to ADHD, HF is often reported and categorized in positive behaviors among ADHD individuals (Hupfeld et al., 2019).

HF is repeatedly cited with clinical representations of schizophrenia, autism spectrum disorder, ADHD, and non-clinical ADHD but empirical evidence is scarce in relevance to its neural, and cognitive functioning (Ashinoff, & Abu-khel, 2019). Regardless, Wiklund, Patzelt, and Dimoy (2016) reported that HF is a major catalyst in positive and/or negative entrepreneurial consequences as HF is related to persistence, time commitment, passion, and perseverance. Lasky, et al. (2016) established that HF is associated with a reward-seeking mechanism in an entrepreneurial setting. Similarly, Wiklund et al., (2016) put forward a conceptual model focused on the role of hyper-focus as a moderator in ADHD individuals for entrepreneurial outcomes. This moderating role is fueled by the internal reward processing system leading to sustained goal-directed entrepreneurial actions among ADHD adults (von Rhein et al., 2015).

**H4:** Hyper-focus moderates the relationship between ADHD tendency and IEO among entrepreneurs.



Note. ---- Mediation, - - -Moderation

**Figure 3.** Hypothesized Model

The hypothesized model (Figure 3) is informed through the lens of DET as individuals with ADHD (Tendency or diagnosed) is considered as disadvantaged entrepreneurs, exhibiting entrepreneurial resilience and a higher relation to individual entrepreneurial orientation.

## 2.7 National Context

Pakistan is a fast-growing economy with a rate of ~6% through to 2026, with the status shift from ‘frontier’ market to ‘emerging’ market (Henry, & Pomeroy, 2018). The Pakistani diaspora remains nascent in field of entrepreneurship, may it be on academic level or on practical level. There has been a rise in startup activity to meet the demands of the always growing economy. The government established incubators across nation with a tax relief program to motivate and encourage the surge in startup culture. The private sector is also not far in the run with foreign investors interested in funding through venture firms or as independent venture capitalists (McKinsey, 2019). Around 720 startups were established since 2010, with 100 of them securing international fundings (invest2innovate, 2019). Soomro, Almahdi, & Shah (2020) reported a significantly positive effect of favorable marketing conditions and eco-friendly people for sustainable entrepreneurship. This is not the only the cased for male gender but also for females as Yaqoob (2020) used Gioia methodology and reported that female entrepreneurs optimize not only their own living standard but also aids in wealth creation, social acceptance, poverty reduction, economic well-being, etc. Regardless of the change in trend, Pakistan requires considerable changes in policies and create a more enabling infrastructure. Arshad (2019) further commented that Higher education commission has to play its part in imparting entrepreneurship-relevant knowledge across institutes and incubators.

## METHOD

### 3.1. Research Philosophy and Design

The study will be based on an objective ontological view asserting that ‘social phenomena and their meanings have an existence that is independent of social actors’ (Bryman, 2012). Positivism is defined as the philosophical stance grounded on observable reality, aimed to generalize results. It is focused on pure data, without any effect of human bias (Alharahsheh, & Pius, 2020; Saunders et al., 2021). Hence the epistemological focus will be on measurable facts that would help in creating meaning in data, aiming to develop causal and/or correlational relationship (Scotland, 2012). A quantitative research methodology is adopted as the topic requires a primarily deductive process of organizing data into statistical and generalizable forms (Babbie, 2015). Quantitative research emphasizes numeric unchanging data and detailed convergent reasoning rather than divergent reasoning (Nenty, 2009). As per the research methodology and the demands of the objectives of the study, a cross-sectional survey was conducted through a self-administered questionnaire (Appendix C). The finalized questionnaire is attached with a cover letter and consent form (Appendix B) duly approved by the departmental review committee at NUST Business School. The unit of analysis is entrepreneurs.

### 3.2. Sample

Sampling for this research is done through the purposive sampling technique, as only those individuals were considered who are entrepreneurs and are running a business venture. As Krejcie, & Morgan (1970) suggests that if the population is more than 10,000, the appropriate sample should be 384 individuals. Since there were not statistics available on how many entrepreneurs are there in Pakistan, the researcher aimed collected a data of 400 individuals. The final data included was of 371 individuals after sorting and screening data, totaling the response rate at 92.75%.

### 3.3. Instruments/Measures

**3.3.1. Adult Self-Report Scale-V1.1 (ASRS-V1.1) Screener.** The 6-question ASRS-V1.1 Screener and scoring system were developed by World Health Organization (Adler, 2003). Respondents rate themselves on a Likert scale. Four (4) or more checkmarks in the shaded area

may indicate an inclination towards symptoms consistent with Adult ADHD. Reliability analysis yielded a Cronbach alpha of 0.72 for the current study.

**3.3.2. The Conner Davidson Brief Entrepreneurial Resilience.** Vaishnavi, Connor, and Davidson (2007) developed a comprehensive version of the original 25 item scale to a 2-item scale to measure resilience, rated on a 5-point Likert scale. A Cronbach alpha of 0.89 was found for this study.

**3.3.3. International Personality Item Pool.** Johnson (2014) developed items to measure various traits across a person's characteristic range. The 6-items for measuring impulsivity were employed with a 5-point Likert scale with 0.40 Cronbach alpha.

**3.3.4. The Hyper-focusing scale.** An 11-item scale rated on a 4-point scale (1 strongly disagree – 4 strongly agree) revealing a score between 11 to 44, was developed by Ozel-Kizil, Demirbaş, Baştuğ, Kasmer, & Başkak, (2013). The Cronbach alpha of 0.71 is reported for the current study.

**3.3.5. Individual Entrepreneurial Orientation Scale.** Boltan, & Lane (2012) and Boltan (2012) put forth a scale to measure individual entrepreneurial orientation consisting of 10 items subdivided into three dimensions: risk-taking, innovativeness, and proactivity. Responses ranged from 1 to 5 i.e., strongly disagree to strongly agree respectively. The Cronbach alpha was calculated to be 0.69.

**Table 1**

*Descriptive Analysis of Sample (n=371)*

<b>Instruments</b>	<b>Frequency</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Cronbach Alpha</b>
ADHD Screener	Yes 222 (59.8%); No 149 (40.2%)	-	-	0.72
ER	-	5.21	3.29	0.89
Imp	-	21.46	5.34	0.40
HF	-	30.78	7.80	0.71
IEO	-	12.45	1.60	0.69

Note. ADHD: Attention-deficit Hyperactivity Tendency, ER: Entrepreneurial Resilience, Imp: Impulsivity, HF: Hyper-focus, IEO: Individual Entrepreneurial Orientation

**Table 1.** *Descriptive Analysis*

### **3.4. Procedure**

After screening the essentials of the research study over APA ethical considerations, a standardized procedure was followed for conducting the present study. All the above-mentioned scales were adopted as it is, after assessing any need for operationalizing the measures. A permission letter from the department was requested. After the issuance of the permission letter, data collection began. The participant was briefed about the research purpose. They were asked to sign a consent form to assure voluntary participation in the study. The researcher conducted a survey herself to help facilitate data collection. The survey was based on standardized tools of assessment on ADHD, ER, Impulsivity, HF, and IEO in English language. Once data was collected, participants were thanked for their cooperation and were debriefed on the research topic, specifically to ADHD tendency to minimize any psychological effect during the research owing to its sensitive nature. Statistical Package for Social Sciences (SPSS) was used for data analysis to conclude research findings.

### **3.5. Data analysis plan**

Statistical Package for Social Sciences (SPSS) version 20, with Process Macro extension v3.4 and SPSS AMOS version 18 were used to analyze data. Descriptive statistics were done to report the mean, standard deviation, and frequency of the data. A point-biserial correlation was applied to measure the correlation between the dichotomous independent (ADHD-like tendency) and continuous dependent variable (IEO). Additionally, the point-biserial correlation was also conducted for subscales of the dependent variable (Risk-taking, Innovativeness, & Proactiveness). Independent t-test and one-way ANOVA were also conducted between independent and dependent variables to measure statistically significant differences between dichotomous groups. A confirmatory factor analysis was also run through SPSS AMOS (Version 18.0) to assess the model fit. For mediation and moderation analysis, Process MACRO extension by Hayes (2017) was employed.

### **3.6. Ethical consideration for research**

The current research has adhered to ethical considerations provided by American Psychological Association. The researcher maintained the Beneficence and Non-maleficence with all participants and took care to not harm. The researcher's personal and professional judgments

including personal, financial, social, organizational, or political factors did not influence the participant. Fidelity and Responsibility were established between researcher and participant by taking informed consent, maintaining anonymity, privacy and confidentiality. The researcher respected the participant's rights and dignity by being aware of the participant's cultural and demographical differences. The participant was allowed to practice their right to withdraw from their study anytime (Sales, & Folkman, 2000).

## Results

The study aims to find out the relation between ADHD tendency and individual entrepreneurial orientation. The following chapter employs time-tested statistical analysis to test the hypothesis and draw a generalizable conclusion. Following were the tests employed; Point-biserial correlation, Independent t-test, and One-way ANOVA using SPSS (version 20), Confirmatory Factor Analysis using SPSS AMOS (version 18.0), and mediation and moderation using Process MACRO extension (v3.4).

**Table 2**

*Correlation between ADHD tendency and Individual Entrepreneurial Orientation (IEO) (n=371)*

Variables	Mean (SD)	1	2
ADHD	5.21 (3.29)	-	0.171**
IEO	12.45 (1.60)	0.171**	-

Note. ADHD: Attention-deficit Hyper-activity tendency; IEO: Individual Entrepreneurial Orientation; SD: Standard deviation; \*\*p<0.01

A point-biserial correlation was run to determine the relationship between ADHD tendency and IEO. There was a positive correlation between ADHD tendency and Individual entrepreneurial orientation, which was statistically significant ( $r_{pb} = 0.171, n = 371, p < 0.01$ ). Although a low correlation coefficient supports the assumption of no multi-collinearity, it was still tested through Variance Inflation factor (VIF), where all values were less than 5, showing no multi-collinearity.



**Table 3***Point-Biserial Correlation between ADHD tendency and IEO Subscales (n=371)*

<b>Variables</b>	<b>Mean (SD)</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
ADHD	5.21 (3.29)	-	0.365**	0.025	0.133*
RT	10.78 (2.75)	-	-	-	-
IN	14.73 (2.42)	-	-	-	-
PA	11.86 (1.83)	-	-	-	-

Note. SD: Standard deviation; ADHD: Attention-deficit Hyper-activity tendency; RT: Risk-taking; IN: Innovativeness; PA: Proactiveness; \* $p < 0.05$ ; \*\* $p < 0.01$

A point-biserial correlation was run to determine the relationship between ADHD tendency and subscales of IEO i.e., risk-taking, innovativeness, and proactiveness. There was a statistically significant positive correlation between ADHD tendency and risk-taking ( $r_{pb} = 0.365, n = 371, p < 0.01$ ). Similarly, a positive and statistically significant correlation between ADHD tendency and proactiveness ( $r_{pb} = 0.133, n = 371, p < 0.05$ ). Whereas, innovativeness was not statistically significant ( $r_{pb} = 0.025, n = 371, p = 0.63$ ).

**Table 4**

*Group comparison between ADHD tendency on IEO using independent t-test (n=371)*

Variable	ADHD-tendency		t (371)	p-value	95% CL		df
	Mean (SD)				LL	UL	
	Yes	No					
IEO	12.67 (1.51)	12.12 (1.68)	-3.330	P<0.001	-0.88	-0.22	369

Note: ADHD: Attention-deficit Hyper-activity tendency; IEO: Individual Entrepreneurial Orientation; SD: Standard deviation; LL: Lower limit; UL: Upper limit.

This study found that participants with ADHD tendency had statistically significantly more Individual entrepreneurial orientation ( $12.67 \pm 1.51$ ) as compared to participants with no ADHD tendency ( $12.12 \pm 1.68$ ),  $t(371)=-3.330$ ,  $p<0.001$ .

**Table 5***One-way Analysis of Variance (ANOVA) of ADHD tendency and IEO (n=371)*

<b>Source</b>	<b><i>df</i></b>	<b>SS</b>	<b>Mean Square</b>	<b><i>F</i></b>	<b><i>p</i></b>
Between Groups	1	27.74	27.74	11.092	0.001
Within Groups	369	923.12	2.50		
Total	370	950.87			

Note. *df*: degree of freedom; SS: Sum of Squares.

There was a statistically significant difference between groups as determined by one-way ANOVA ( $F(1, 369) = 11.092, p = .001$ ).

**Table 6***Confirmatory Factor Analysis (n=371)*

<b>Model</b>	<b>CMIN/DF</b>	<b>CFI</b>	<b>RMSEA</b>
35 items	3.741	0.629	0.086
19 items	3.112	0.910	0.076

Note. CMIN/DF: Absolute/predictive fit Chi-square; CFI: Comparative fit index; RMSEA: Root mean square error of approximation

A confirmatory factor analysis was used to assess the model fit. The following indices were selected to test which CFA model best represents the present dataset: (i) Absolute/predictive fit Chi-square (CMIN/DF), (ii) Comparative Fit Index (CFI); and (iii) Root-mean-squared error of approximation (RMSEA). When comparing models, the ratio of  $\chi^2$  to  $df \leq 2$  or 3 value indicates a better fit, given an equal number of degrees of freedom. The general rule for acceptable fit if data are continuous in the case of CFI is  $\geq .95$  for acceptance. RMSEA is a measure of the average of the residual variance and covariance and a value from  $< .06$  to  $.08$  is deemed fit. The results from confirmatory factor analyses of the model indicated moderately acceptable-to-good fit of the factors to CMIN/DF= 3.741,  $p < 0.000$  and RMSEA = 0.086 (90% CL 0.081, 0.091). Whereas, the value for CFI= 0.629 is lower than the required value. A total of 16 items had low loadings than 0.5 which were reassessed iteratively. After conducting a series of CFAs, the results from confirmatory factor analyses of the model indicated acceptable-to-good fit of the factors to CMIN/DF= 3.112,  $p < 0.000$ , CFI= 0.910, and RMSEA = 0.076 (90% CL 0.063, 0.088).

**Table 7**

*Bootstrapped Mediation Analyses examine the relation of ADHD tendency and IMP on IEO (n=371)*

Variables	$\beta$ (SE)	t	R <sup>2</sup>	95% CL	
				LL	UL
ADHD - IMP	6.94 (0.43) ***	15.93	0.407	6.08	7.80
ADHD - IEO	0.55 (0.16) **	3.33	0.029	0.22	0.88
ADHD – IMP - IEO	-0.22 (.21)	-1.06	0.11	-0.63	0.18

Note: ADHD: Attention-deficit Hyper-activity tendency; IEO: Individual Entrepreneurial Orientation; IMP: Impulsivity;  $\beta$ = Standardized regression weights; SE: standardized estimates; R<sup>2</sup>= Explained Variance; Bootstrap sample size 5,000; LL: Lower limit; UL: Upper limit; \*\*p <0.01; \*\*\*p<0.001

ADHD tendency is a significant and positive predictor of IMP ( $\beta$ = 6.96, p<0.001) i.e., if the tendency of ADHD increases, the impulsivity also increases and vice versa. Similarly, ADHD tendency significantly predicts IEO ( $\beta$ = 0.55, p<0.01) i.e., if the tendency to have ADHD increases, the individual entrepreneurial orientation increases, and vice versa. The model between ADHD tendency and IEO was not significantly mediated by IMP ( $\beta$ = -0.22, p= 0.28), but the negative sign indicates that if impulsivity increases, individual entrepreneurial resilience decreases.

**Table 8**

*Bootstrapped Mediation Analyses examine the relation of ADHD tendency and ER on IEO (n=371)*

Variables	$\beta$ (SE)	t	R <sup>2</sup>	95% CL	
				LL	UL
ADHD - ER	4.44 (0.26) ***	16.95	0.4378	3.92	4.95
ADHD - IEO	0.55 (0.16) **	3.33	0.029	0.22	0.88
ADHD – ER - IEO	0.56 (0.22) **	2.50	0.029	0.12	1.00

Note: ADHD: Attention-deficit Hyper-activity tendency; IEO: Individual Entrepreneurial Orientation; ER: Entrepreneurial Resilience;  $\beta$ = Standardized regression weights; SE: standardized estimates; R<sup>2</sup>= Explained Variance; LL: Lower limit; UL: Upper limit; \*\*p <0.01; \*\*\*p<0.001

The results showed that all of the path coefficients were statistically significant. ADHD tendency is a significant and positive predictor of ER ( $\beta$ = 4.44, p<0.001) i.e., if the tendency of ADHD increases, the entrepreneurial resilience also increases and vice versa. Similarly, ADHD tendency significantly predicts IEO ( $\beta$ = 0.55, p<0.01) i.e., if the tendency to have ADHD increases, the individual entrepreneurial orientation increases, and vice versa. The model between ADHD tendency and IEO was significantly mediated by ER ( $\beta$ = 0.56, p <0.01).

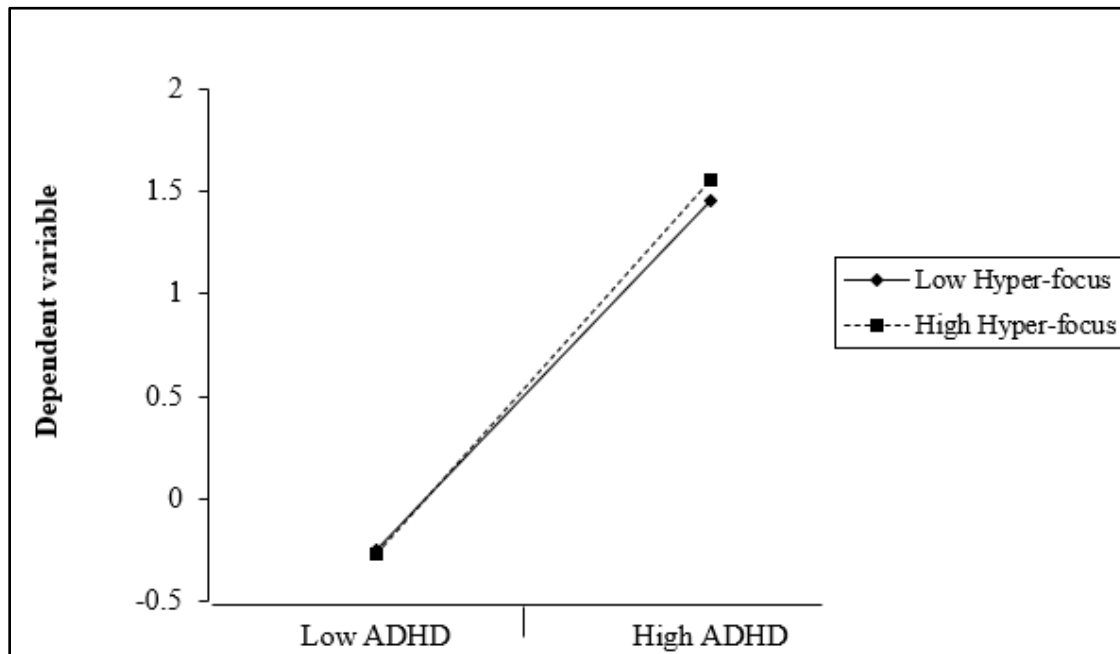
**Table 9**

*Bootstrapped Moderated-Mediation Analyses examine the relation of ADHD tendency and Hyper-focus on ER, IMP, and IEO (n=371)*

Variables	$\beta$ (SE)	t	R <sup>2</sup>	95% CL	
				LL	UL
ADHD - ER	4.43 (0.26) ***	16.95	0.43	3.92	4.95
ADHD - IMP	6.94 (0.43) ***	15.93	0.40	6.08	7.80
ADHD- HF - IEO	-2.33 (0.88) **	-2.64	-	-4.07	-0.60
ER – HF - IEO	-0.18 (0.03) ***	-4.60	-	-0.25	-0.10
IMP – HF - IEO	0.11 (0.02) ***	5.26	-	0.06	0.14
HF - IEO	0.03 (0.02)	1.58	-	-0.00	0.07
ADHD x HF – IEO	0.07 (0.03) **	2.30	0.18	0.01	0.13

Note: ADHD: Attention-deficit Hyper-activity tendency; IEO: Individual Entrepreneurial Orientation; ER: Entrepreneurial Resilience; IMP: Impulsivity; HF: Hyper-focus  $\beta$ = Standardized regression weights; SE: standardized estimates; R<sup>2</sup>= Explained Variance; Bootstrap sample size 5,000; LL: Lower limit; UL: Upper limit; \*\*p <0.01; \*\*\*p<0.001

There was a positive but non-significant relation between HF and IEO ( $\beta$ = 0.03, p=0.11). Whereas, HF moderated the relationship between ADHD tendency and IEO ( $\beta$  = 0.07, p<0.01) i.e., if hyper-focus increases, it would increase the effect of the ADHD tendency on individual entrepreneurial orientation.

**Figure 4****Figure 4.** *Two-way Interaction plot (ADHD tendency x Hyper-focus)*

A visual presentation of the interaction demonstrating the pattern of effect in individuals with no tendency of ADHD and with the tendency of ADHD (Figure 3).



**Table 10***Indirect effects of Hyper-focus on ER and IMP (n=371)*

Indirect effects	Effect (SE)	95% CI	
		LL	UL
Low Hyper-focus	-0.66 (0.26) **	-1.19	-0.13
Moderate Hyper-focus	-0.08 (0.26)	-0.61	0.44
High Hyper-focus	0.49 (0.44)	-0.38	1.37
Index for moderated mediation			
ER	-0.80 (0.19) **	-1.20	-0.44
IMP	0.74 (0.17) **	0.44	1.12

Note: ER: Entrepreneurial Resilience; IMP: Impulsivity; SE: standardized estimates; Bootstrap sample size 5,000; LL: Lower limit; UL: Upper limit; \*\*p<0.01

Further hypothesis tests were conducted to determine whether the conditional indirect effect was statistically significant at values corresponding to low ( $W = 23$ ), moderate ( $W = 31$ ), and high ( $W = 39$ ) values of hyper-focus. This was accomplished through PROCESS as it automatically generates these conditional indirect effects at moderator values corresponding to the 16th, 50th, and 84th percentile points in the sample data. Results revealed that entrepreneurial resilience and impulsivity mediated the association between ADHD and IEO for individuals with low hyper-focus ( $\omega_{Low} = -0.66$ , CI = -1.19, -0.13) but there was no evidence of an indirect effect with moderate hyper-focus ( $\omega_{Moderate} = -0.08$ , CI = -0.61, 0.44) and high hyper-focus ( $\omega_{High} = 0.49$ , CI = -0.38, 1.37). A formal test of moderated mediation based on the index term (Hayes, 2015) revealed that hyper-focus negatively moderated the indirect effect of ER on IEO (effect= -0.80, 95% CI = -1.20, -0.44) and that hyper-focus positively moderated the indirect effect of IMP on IEO (effect= 0.74, 95% CI = 0.44, 1.12).

### Discussion

The study aimed at establishing the relationship between ADHD tendency and individual entrepreneurial orientation (IEO) where IEO corresponds to three of its components; proactiveness, risk-taking, and innovativeness. The relationship was further studied about how it is mediated by impulsivity and entrepreneurial resilience. Furthermore, how ‘hyper focus’ affects the path between predictor and the outcome variable. It is worth mentioning here that IEO not only measures one’s capability to be an entrepreneur but acts as an umbrella term for entrepreneurial intent, inclination, motivation, performance (Successful or failing), and profile, etc. (Thurik et al., 2020; 2016; Boltan, 2012). Similarly, people with ADHD tendency i.e., exhibiting the symptomology of ADHD, are not be clinically diagnosed with the disorder itself (Antshell, 2018; Verheul et al., 2015).

To study the relationship between ADHD tendency and IEO, a point biserial correlation was run. A minimal but positive significant correlation was established between the two variables. This correlational result can be further facilitated by studying the group differences between those exhibiting an ADHD tendency and those who don’t. A t-test concluded that participants with ADHD tendency had statistically significantly more Individual entrepreneurial orientation as compared to participants with no ADHD tendency. This was further confirmed by an ANOVA test as group differences existed statistically significant between both groups. Hence accepting H1 ‘ADHD tendency will have an effect on IEO among entrepreneurs.’ This is supported by different studies across time that suggested that inattentiveness and hyperactivity increase imagination and multitasking, making a person’s entrepreneurial profile strong (Vörös, & Lukovszki, 2021; Thurik et al., 2020; Lerner, Verheul, & Thurik, 2019; Boot, Nevicka, & Baas, 2017; Verheul et al., 2015; White, & Shah, 2011). This is in line with the DET and P-E fit as wage employment is not the preferred mode of income and earnings for those with a disadvantaged factor i.e., ADHD tendency in the current study. Although the minimal correlation of 0.17\*\* may seem less and is in line with the results of the work by Tucker et al., (2021) which positions ADHD as less productive for entrepreneurship as opposed to recent literature. This further points to replication of this relationship for future studies as low correlational may confirm the distinctiveness of both variables but there is not enough literature to justify the relation sure short. Special attention should

be given to the results of descriptive statistics that shows 59.8% of individuals of the whole sample screened positive for ADHD tendency. It may seem alarming at first but this screening is for 'tendency' only and not of clinical diagnosis. This percentage corresponds to the global prevalence rate of ADHD symptomology in approximately 50-70% of the said population (Biederman et al., 2010). No data is available for the prevalence rate of ADHD tendency (not diagnosis) for Pakistan.

Keeping the minimal correlation between ADHD tendency and IEO, the relationship between ADHD and IEO's components needed exploration as well. Hence, a point-biserial correlation was run to determine the relationship between ADHD tendency and subscales of IEO i.e., risk-taking, innovativeness, and proactiveness. There was a statistically significant positive but low correlation between ADHD tendency and risk-taking, accepting H1a 'ADHD tendency will have a positive effect on risk-taking among entrepreneurs.' Similarly, a minute but positive statistically significant correlation between ADHD tendency and proactiveness existed, accepting H1c 'ADHD tendency will have an effect on Proactiveness among entrepreneurs.' Whereas, innovativeness was not statistically significant concerning ADHD tendency, rejecting H1b 'ADHD tendency will have an effect on Innovativeness among entrepreneurs.' Lasky et al., (2016) proposed that those with ADHD likelihood perform well in 'highly stimulating' work environments. These environments require risk-taking, innovation, creativity, proactiveness, etc. The literature remains inconclusive regardless of the work done by regarded scholars (Sônego et al., 2020; Cantis et al., 2019; Verheul et al., 2016). The reasons may vary from skill-building, level of symptomology, entrepreneurial culture, societal regard to mental health and entrepreneurship on a general level, etc. Miller and Brenton-miller (2017) reported results that participants with ADHD showed more risk-taking propensity and less proactiveness but had a non-significant relation with entrepreneurial success in terms of annual profits but was more related to the generalized entrepreneurial profile. Although risk-taking propensity has been associated with ADHD and IEO for various reasons, a unique explanation was offered by Damasio's somatic marker hypothesis which proposes that individuals with ADHD-tendency register weaker physical signals, hence taking riskier decisions (Mäntylä, Gullberg, & Del Missier, 2012) and involving oneself into riskier careers including entrepreneurship (Verheul et al., 2015; Niess and Biemann, 2014; Zhao et al., 2010). Verheul et al., (2015) concluded the same for risk-taking tendency's relation with ADHD. Whereas, White and Shah (2011; 2006) reported that a relation existed between innovativeness and proactiveness with IEO. Proactivity can be well explained by the lack

of patience in individuals with ADHD-tendency. Impatience triggers one's need to engage and involve in new and novel behaviors in the work environment. This fuels the constant and vigilant outlook towards opportunity recognition (Wiklund, Patzelt, and Dimoy, 2016). Whereas, Lee et al., (2011) explained the role of innovativeness in light of P-E literature and proposed that the difference between an individual's and company's innovation orientation invigorates entrepreneurial intention and orientation. Hence, if an ADHD-like individual experiences dissatisfaction and a poor fit in wage employment, he/she would prefer self-employment. Whereas Wismans et al., (2020) studied ADHD with entrepreneurial orientation. They reported no relationship of ADHD to entrepreneurial orientation but found a significant correlation between risk-taking. DET discusses this relationship under the effect of disadvantaged individuals' capacity to rely on divergent thinking and the need to take risky life decisions or find ways to make with. This life-long learning can be seen in motion during their entrepreneurial journey. This view was tested by Rajah, Bamiatzi, and Williams (2021) in a longitudinal study where they measured the symptoms of ADHD at age 10 and entrepreneurial performance as an adult. They reported that ADHD tendency may positively affect entrepreneurship as a career path but may have a negative impact on the venture's survival.

Apart from correlation, mediating effect of impulsivity and entrepreneurial resilience was also studied pertaining to the fact that former acts as a pseudo-symptom to ADHD, and latter is mandatory with IEO. The current study measured the mediating effect of impulsivity and found contradictory results, rejecting H2 'Impulsivity mediates the relationship between ADHD tendency and IEO among entrepreneurs.' The results showed that ADHD tendency is a significant and positive predictor (40.7%) of IMP i.e., if the tendency of ADHD increases, the impulsivity also increases and vice versa. Similarly, ADHD tendency significantly (2.9%) predicts IEO i.e., if the tendency to have ADHD increases, the individual entrepreneurial orientation increases, and vice versa. This further strengthens the correlation results discussed above for H1. Whereas, the model between ADHD tendency and IEO was not significantly mediated by IMP but an alternative relationship existed i.e., if impulsivity increases, individual entrepreneurial orientation decreases. Impulsivity is dubbed as pseudo-symptom in diagnosed and the likelihood of ADHD individuals (Sorenso et al., 2017) as it plays a role in finding and seizing an opportunity and working towards functional and operational outcomes. Few studies have reported results on how impulsivity associates with ADHD in the entrepreneurship field as the energy levels help work extra hours,

whereas boredom at a corporate job would lead to burnout. (Wiklund, Patzelt, & Dimov, 2016; van Gelderen et al., 2015) but no study was found that was in support of the results of the current study, hence asserting H2 as a unique finding to this area of research, requiring further investigation.

ER was the second mediator that was tested in the proposed model as ER is dubbed as a necessity for entrepreneurial orientation at the individual level. The current study reported all of the paths had statistically significant coefficients with ER as mediator. ADHD tendency is a significant and positive predictor (43%) of ER i.e., if the tendency of ADHD increases, the entrepreneurial resilience also increases and vice versa. Similarly, the model between ADHD tendency and IEO was significantly mediated by ER to 2.9%, accepting H3 'ER mediates the relationship between ADHD tendency and IEO among entrepreneurs.' This is primarily because of the ability to accept and adapt to change and ambiguity, leading to venture establishment and sustenance (Uygun and Kim, 2016; Denz-Penhey, & Murdoch, 2008). Disadvantaged entrepreneurs' theory has its most solid pillar grounded in the concept of resilience (Maalaoui et al., 2020; Morgan, 2020; Light, 1979) as it contradicts the past literature that deemed adversity as a stressor, and considers it eustress to embed and inculcate resilience in disadvantaged communities, including ADHD. Recent studies have supported this understanding of DET that ER already exists as a coping mechanism in people with ADHD like symptomology and outperforming non-ADHD like individuals in self-employed environments (Verheul et al., 2015; Patel and Thatcher 2014; Bozionelos and Bozionelos, 2013; Seery, et al. 2013; Holland and Shepherd, 2013; van Gelderen, 2012; Wilmshurst, Peele, & Wilmshurst, 2011; Seery et al. 2010).

Apart from mediating factors, moderation has been rarely studied in the literature about disadvantaged entrepreneurs, hence the current study analyzed hyper-focus as a moderator to the ADHD tendency and IEO relationship. Although there was a positive but non-significant relation between HF and IEO, HF moderated the relationship between ADHD tendency and IEO to 18% i.e., if hyper-focus increases, it would increase the effect of the ADHD tendency on individual entrepreneurial orientation, accepting H4 'Hyper-focus moderates the relationship between ADHD tendency and IEO among entrepreneurs.' Results further revealed that ER and IMP mediated the association between ADHD and IEO for individuals with low hyper-focus but there was no evidence of an indirect effect with moderate hyper-focus and high hyper-focus. Furthermore, a

formal test of moderated mediation based on the index term (Hayes, 2015) revealed that HF negatively moderated the indirect effect of ER on IEO whereas, positively moderated the indirect effect of IMP on IEO. DSM-V does not use the term ‘hyper focus’ as a clinical symptom for ADHD but the literature has persistently linked HF with ADHD-like symptomology (von Rhein et al., 2015; Sklar, 2013; Schecklmann et al., 2008). This association is further reported to be as one of the positive behavioral tendencies among clinical and non-clinical ADHD individuals (Hupfeld et al., 2019; Goodwin and Oberacker, 2011, Travis, 2010) and its behavioral markers include commitment, perseverance, and passion for entrepreneurial consequences (Wiklund, Patzelt, and Dimoy, 2016; Lasky et al., 2016). Wiklund et al., (2016) proposed HF as a moderator in his conceptual model and the current study is the first one to test it statistically. There is no direct literature to discuss findings but Moore, McIntyre, and Lanivich (2021) studied the neurodiversity from ADHD on the entrepreneurial mindset and reported that ADHD (diagnosed and likelihood) has an intuitive cognitive style, and exhibits more entrepreneurial alertness. This supports the concept of HF as it is intuitive and requires high vigilance to perform various entrepreneurial tasks at once.

## **5.1. Conclusion**

In conclusion, this research has found a significant positive correlation between ADHD tendency and IEO. This is parallel to the results of Yu, Wiklund, & Perez-Luno, (2021; 2018) conducted in the US and Spain as well as to results of Wismans et al., (2020b) done in Japan, even though the current study is conducted in a completely different culture of Pakistan. This correlation is mediated significantly and positively by ER whereas was not significantly mediated by IMP, although it showed negative relation. Hence strengthening the literature on the effect of ER but requiring further investigation for IMP. Additionally, it is the first study to empirically and statistically assess that HF moderated positively the ADHD-tendency and IEO relationship with only low hyper-focus significantly moderating the mediation of ER and IMP on ADHD and IEO. The study identifies a gap and contribute to existing literature and practices of entrepreneurial residence especially in the context of developing/emerging economies such as Pakistan and adds to the global research gap in this emergent field on academic as well as industrial level.

## **5.2. Limitations**

The current study had various fruitful results but no research is free of limitations. Although some data were collected face-to-face, most of the data collection was done through an online survey on google forms, which does not establish whether the participant was serious while responding. The response rate was low initially and there was a considerable time between the first questionnaire submission and the last questionnaire submission, although it is common with online surveys (Heiervang, & Goodman, 2011; Nulty, 2008). There were sociodemographic differences among the sample which were not included in the study. International Personality Item Pool developed by Johnson (2014) was used to assess impulsivity. It showed moderate reliability of 0.40. A major limitation pertains to the COVID-19 pandemic as venture owners and self-employed individuals are the most vulnerable (Ratten, 2021). The uncertainty and vulnerability may have subconsciously affected the responses to our survey.

## **5.3. Theoretical Implications**

These results will not only add to the academic literature but will also have practical implications for policymakers. The study will enrich the newly emerging scholarly interest in associating mental health (clinical and non-clinical) with entrepreneurship. The research aims to add to the pool of knowledge between ADHD-tendency and entrepreneurship, albeit at the non-clinical level. This will also take a step further to establish domain-specific entrepreneurship psychology theory that has been broad till recent past. Although the literature has deemed ADHD symptomology as negatively connotative to dysfunctional, the current study challenges this concept, supporting the notion that the field of entrepreneurship needs its theories as theoretical understandings from other pure domains such as psychology, management, business, etc., do not fit and hold up in entrepreneurship field. Moreover, the research has been done in a completely different culture adds robustness, and weight to the relationship between ADHD and IEO.

## **5.4. Practical Implications**

Based on the findings of such a study, educators can help ADHD adolescents and adults in selecting a career path fit for their characteristics. Moreover, managers will be able to understand how the limitations of being an ADHD adult can prove advantageous for the company. Furthermore, training firms can shift to project-based learning rather than theoretical learning to

facilitate future entrepreneurs with ADHD-like symptoms. Additionally, identifying ADHD tendencies that facilitate entrepreneurial orientation and actions will help in inculcating and utilizing these symptoms as traits to be taught to the non-ADHD population.

### **5.5. Recommendations**

Future researchers are recommended to consider other related variables in association with ADHD and entrepreneurship. Different sectors of small and medium enterprises can be catered separately as well as cross-cultural studies may help in better understanding. The same study can be replicated in other cultures to validate the findings as universal. Qualitative studies should also be planned to take an in-depth understanding of the relationships at work. DET should be established further in our economic world as well as across the world. Other theories such as Coping-dueling-fit theory, Social construct theory, etc. can be used as a lens to study such relationships. Further research will help in moving towards intervention-based researches to facilitate those with ADHD, ADHD-tendency, and non-ADHD. Furthermore, other mental health tendencies or disorders such as autism spectrum disorder, dyslexia, etc., can be studied in relation to entrepreneurship.



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## Appendix A

### DSM-5 Criteria for ADHD

People with ADHD show a persistent pattern of inattention and/or hyperactivity–impulsivity that interferes with functioning or development:

1. Inattention: Six or more symptoms of inattention for children up to age 16 years, or five or more for adolescents age 17 years and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level:

Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities.

Often has trouble holding attention on tasks or play activities.

Often does not seem to listen when spoken to directly.

Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked).

Often has trouble organizing tasks and activities.

Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework).

Often loses things necessary for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).

Is often easily distracted

Is often forgetful in daily activities.

2. Hyperactivity and Impulsivity: Six or more symptoms of hyperactivity-impulsivity for children up to age 16 years, or five or more for adolescents age 17 years and older and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level:

Often fidgets with or taps hands or feet, or squirms in seat.

Often leaves seat in situations when remaining seated is expected.

Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless).

Often unable to play or take part in leisure activities quietly.

Is often “on the go” acting as if “driven by a motor”.

Often talks excessively.

Often blurts out an answer before a question has been completed.

Often has trouble waiting their turn.

Often interrupts or intrudes on others (e.g., butts into conversations or games)

3. In addition, the following conditions must be met:

Several inattentive or hyperactive-impulsive symptoms were present before age 12 years.

Several symptoms are present in two or more settings, (such as at home, school or work; with friends or relatives; in other activities).

There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school, or work functioning.

The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or a personality disorder). The symptoms do not happen only during the course of schizophrenia or another psychotic disorder.



**Appendix B**  
**Informed Consent Form**

Thank you so much for your willingness to participate in my research titled “Attention-deficit/Hyperactive disorder and Entrepreneurial orientation; The mediating role of Entrepreneurial resilience and Impulsivity among Pakistani entrepreneurs”.

I confirm that (please tick box as appropriate):

1.	I have read and understood the information about the project/research.	<input type="checkbox"/>
2.	I have been given the opportunity to ask questions about my participation.	<input type="checkbox"/>
3.	I voluntarily agree to participate in the project.	<input type="checkbox"/>
4.	I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.	<input type="checkbox"/>
5.	The procedures regarding confidentiality have been clearly explained	<input type="checkbox"/>
6.	I have been given information about the protocols for data collection.	<input type="checkbox"/>
7.	The use of the data in research, publications, sharing and archiving has been explained.	<input type="checkbox"/>
8.	I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form.	<input type="checkbox"/>
9.	I, along with the Researcher, agree to sign and date this informed consent form.	<input type="checkbox"/>

**Participant:**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**Researcher:**



\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

I am a student of MS Innovation & Entrepreneurship at NUST Business School, NUST. Thank you so much for your willingness to participate in my research on the area "Attention-deficit/Hyperactive Tendency and Entrepreneurial orientation". Please complete the whole questionnaire. I will be highly grateful. Thank you.

Check the box that best describes how you have felt and conducted yourself over the past 6 months.

**Gender:** \_\_\_\_\_

Statements	Never	Rarely	Sometimes	Often	Very Often
How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?					
How often do you have difficulty getting things in order when you have to do a task that requires organization?					
How often do you have problems remembering appointments or obligations?					
When you have a task that requires a lot of thought, how often do you avoid or delay getting started?					
How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?					
How often do you feel overly active and compelled to do things, like you were driven by a motor?					

Statements	Mostly True	Often True	Sometimes True	Rarely True	Not at All
I am able to adapt when changes occur.					
I tend to bounce back after illness, injury or other hardships.					

	Very Inaccurate	Moderately Inaccurate	Neutral	Moderately Accurate	Very Accurate
Do things by the book					
Stick to the rules					
Never splurge					
Enjoy being reckless					
Do crazy things					
Like to act on a whim					

<b>Statements</b>	<b>Disagree Strongly</b>	<b>Disagree</b>	<b>Agree</b>	<b>Agree Strongly</b>
While I'm busy with something, although repeatedly addressed, I often don't hear or react.				
Due to excessive focusing on a work, I often neglect myself and those around me.				
It is often not to complete work which I have started.				
While I'm busy with something, I don't care if the world bemoans.				
Due to the fact that I spend a long time on a work, my relationships with people are often disrupted.				
While working on a topic, I often delay other important things that I have to do.				
Because I can't leave the work which I'm dealing with, I often stay late to the places where I should go.				
While I'm busy with something, although it has been a long time, it generally seems to me as if it was shorter.				
While dealing with a work that interests me, I often feel that time flies by.				
Due to playing computer games (solving puzzles, fixing something, etc.) for hours, I often postpone other things that I have to do.				
Due to dealing with a work for a long time, although I don't feel anything at that moment, I have pain in various parts of my body.				

<b>Statements</b>	<b>Disagree Strongly</b>	<b>Disagree</b>	<b>Neither agree or disagree</b>	<b>Agree</b>	<b>Agree Strongly</b>
I like to take bold action by venturing into the unknown.					
I am willing to invest a lot of time and/or money in something that might yield a high return.					
I tend to act “boldly” in situations where risk is involved.					
I often like to try new and unusual activities that are not necessarily risky.					
In general, I prefer a strong emphasis on projects with unique, one-of-a-kind approaches rather than revisiting tried and true approaches.					
I prefer to learn new things my own way rather than the way everyone else does.					
I favor experimentation and original approaches to problem solving rather than the methods others generally use.					
I usually act in anticipation of future problems, needs or changes.					
I tend to plan ahead on projects.					
I prefer to “step-up” and get things going on projects rather than sit and wait for someone else to do it.					

*Thank you for Participation*