

ADHD-like behavior and entrepreneurial intentions

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ABSTRACT

Little is known about the relation between validated psychiatric symptoms scores and the entrepreneurial decision. Building on the Person-Environment (P-E) fit literature and using data of over 10,000 students, we test whether individuals with higher levels of attention deficit and hyperactivity (ADHD) have higher entrepreneurial career intentions compared to others. We find that students reporting higher levels of ADHD-like behavior (assessed with a symptom score on an ADHD screening scale) are more likely than their peers to display entrepreneurial intentions and become student entrepreneurs. This can be partly explained by their high need for independence and their risk tolerance.

1. Introduction

High levels of attention deficit and hyperactivity are often considered ‘problematic’ for individual wellbeing and the cause of great impairment and distress in the private life of individuals as well as in the workplace. Individuals with ADHD (Attention Deficit and Hyperactive Disorder) tend to show substandard work performance (Nadeau, 2005; de Graaf et al., 2008) and have a higher chance of becoming unemployed (Kessler et al., 2005). Even when equipped with higher levels of intelligence, few of them are found in higher-ranked occupational positions (de Graaf et al., 2008).

At the same time, individuals who have ADHD or demonstrate ADHD-like behavior may perform extraordinarily well in specific work contexts. The popular press gives many examples of successful entrepreneurs with ADHD. For example, David Neeleman, founder of JetBlue Airways, claims that ADHD is one of his greatest assets because it enables him to think out of

the box: “*In the midst of all the chaos in your mind, and all of the disorganization ... and procrastination, your brain just thinks a little bit differently ... and you can come up with things*”.¹ Recently, *The Economist* (2012) praised such ‘disorganization men’ for their gift of breaking through business routines and inertia because of their ability to envision and create new realities. Apparently, when they manage to develop ‘resilience’ mechanisms to cope with their ‘weaknesses’, individuals with ADHD or who display ADHD-like behavior are able to exploit their specific talents and function just as well as, or even better than, the average worker (Hartmann, 2002). This may be the case in particular for individuals who pursue a career in which the job requirements and environment align with their behavior. Given the evidence of linkages with well-known entrepreneurial characteristics such as creativity (White and Shah, 2011), risk taking (Mäntylä et al., 2012), and action orientation (Barkley, 1997), entrepreneurship might be a popular career choice among individuals who have ADHD or show ADHD-like behavior. Remarkably, the link between ADHD and (the choice for) a career in self-employment² has not been systematically examined in the literature (Mannuzza et al., 1993).

Whereas research on ADHD has mainly taken a pathological perspective (i.e., studying the consequences of ADHD as a disorder that is typically diagnosed during childhood), the aim of this study is *not* to diagnose individuals with ADHD and examine the interest in an entrepreneurial career among clinical cases. Rather, we examine whether individuals who exhibit higher levels of ADHD-like behavior (measured with an ADHD screening scale) are more likely than others to prefer a career in entrepreneurship over one as an employee.

¹ Source: CBS news (2009); http://www.cbsnews.com/8301-18560_162-658996.html

² The terms self-employment and entrepreneurship are used as synonyms in the present text.

Building on the Person-Environment (P-E) fit literature (Kristof, 1996; Oh et al., 2013) and that of behavioral intentions (Ajzen, 1991; Shapero and Sokol, 1982) we examine the person-career fit of highly educated individuals who find themselves at the start of their careers. Specifically, we test whether there is a positive relation between ADHD-like behavior and entrepreneurial intentions among more than 10,000 university students. We hypothesize that entrepreneurship *fits* the needs and talents of individuals who display ADHD-like behavior (leading to higher entrepreneurial intentions) as it offers a flexible, dynamic and challenging work environment that allows them to operate relatively independently and that is characterized by relatively high levels of creativity and risk taking. Our results show that ADHD-like behavior increases students' start-up intentions directly after studies. In addition, we find (partial) mediating effects of the need for independence and risk tolerance.

Our study has several contributions. *First*, it contributes to the occupational choice literature by exploring specific behavioral determinants of the future careers of young adults. To our knowledge, there has been no research that systematically and empirically examined the link between ADHD-like behavior and the choice for an entrepreneurial career, nor have there been studies examining the mechanisms that drive such a relationship. A better understanding of this relationship is important considering that individuals with ADHD or who exhibit higher levels of ADHD-like behavior typically have difficulties committing to a career decision (Painter et al., 2008) and exhibit substandard performance when they finally do (Nadeau, 2005). Our findings can help to create awareness of what inspires and motivates these individuals in a (future) profession and support them in deciding upon a career that is aligned with their specific needs and talents. *Secondly*, despite the fact that ADHD persists into adulthood in 30 to 70 percent of cases (Mannuzza et al., 1998), most of what we know about the consequences of ADHD for

individual behavior is derived from research with children. Far less attention is paid to the implications for adult decision-making and behavior (Young, 2000). Our study suggests that (young) adults who demonstrate higher levels of ADHD-like behavior make different career choices than others. They appear to be more attracted to jobs where they can work independently, deal with risk, and work on innovative tasks. *Moreover*, research examining the role of ADHD in the workplace has mainly focused on individuals working in large, established and often heavily regulated organizations (e.g., Kessler et al., 2009). Assuming a fit with self-employment (as opposed to wage-employment), the present study complements this research stream by examining the link with entrepreneurial intentions as a predominant precursor of an entrepreneurial career. Following Markman and Baron (2003, p. 282) who state that: “*While much research on personnel selection has focused on important components of fit with respect to existing, well-established organizations and routines, far less attention has been directed to person-organization fit in the context of new venture formation*”, we examine the person-career fit of individuals who exhibit different levels of ADHD-like behavior. *Finally*, as mentioned before, instead of taking a pathological perspective that focuses on the clinical diagnosis of ADHD as a ‘disorder’, we distinguish between individuals based on their level of ADHD-like behavior (assessed with an ADHD screening scale).

The remainder of this study is structured as follows. In the next section we discuss the literature on person-environment fit and entrepreneurial intentions as well as that on the consequences of ADHD in the workplace. We then pay attention to the mediating role of the need for independence, innovative drive, and risk tolerance in the relationship between ADHD-like behavior and entrepreneurial career intentions. Subsequently, we present our sample and discuss our variables. We elaborate on the results and conclude.

2. Theoretical background and hypotheses

2.1 *Person-career fit and entrepreneurial intentions*

The Person-Environment (P-E) fit literature emphasizes the role of both individual and environmental (or organizational) factors in determining career decisions and outcomes (Kristof-Brown et al., 2011; 2005; Kristof, 1996; Oh et al., 2013), including entrepreneurial intentions (Lee et al., 2011) and entrepreneurial performance (Markman and Baron, 2003). The idea of P-E fit draws on principles of Interactional Psychology, asserting that neither personal nor environmental factors alone are able to explain individual behavior (Lewin, 1951). The underlying premise is that of the compatibility between people and their environment – the latter of which can refer to, for example, an organization, occupation, group of people, or supervisor. This congruence can be conceptualized and measured in different ways (Kristof, 1996, p.3). From a ‘*needs-supplies*’ perspective the work environment is aligned with individuals’ needs, desires and preferences. According to Schneider (1987), people are attracted to organizations whose goals are comparable to their own goals and wishes. The ‘*demands-abilities*’ perspective on the other hand emphasizes a fit between individuals’ abilities and the requirements of the work environment (Kristof, 1996). In this paper we argue that there is a ‘*needs-supplies*’ fit when an individual possesses needs that an entrepreneurial career can fulfill (such as the wish to be independent or innovative drive), and that a ‘*demands-abilities*’ fit exists when an individual has skills or characteristics with which (s)he is able to fulfill the requirements of an entrepreneurial career (such as risk tolerance). This person-career fit is subsequently expected to increase the likelihood that an individual has entrepreneurial intentions.

Understanding the formation of entrepreneurial intentions is essential in creating insight into entrepreneurial behavior (Krueger et al., 2000). In line with Ajzen's (1991) Theory of Planned Behavior (TPB) and Shapero and Sokol's (1982) model of the Entrepreneurial Event (SEE), previous studies indicate that individual attitudes towards entrepreneurship are important for understanding the choice for an entrepreneurial career (Krueger and Carsrud, 1993; Krueger, 1993; Robinson et al., 1991; Kolvereid and Isaken, 2006; Shane et al., 2003). The decision to become an entrepreneur is seen as the outcome of the maximization of anticipated utility derived from entrepreneurship versus that of other career options (Lévesque et al., 2002; Douglas and Shepherd, 1999). Utility can be derived from, e.g., income, work effort, risk, flexibility, self-realization and other working conditions (Douglas and Shepherd, 1999, 2002; Carter, Gartner, Shaver and Gatewood, 2003). In addition to motivation, (perceived) capabilities are essential in determining an individual's career path (Ajzen, 1991; Shapero and Sokol, 1982). People will generally be less likely to choose an occupation if they are inclined to believe they do not possess the right capabilities to execute the tasks that belong to that occupation. In sum, individuals are expected to have higher entrepreneurial intentions when they believe an entrepreneurial career is desirable or feasible for them, i.e., when there is a fit with their needs or abilities (viz., 'needs-supplies' fit or 'demands-abilities' fit).

2.2 ADHD and career choice

Given that ADHD is associated with 'deficiencies' such as acting before thinking, a short attention span, a lack of persistence when facing routine tasks, forgetfulness about appointments,

and difficulty with prioritizing and meeting deadlines (Barkley, 1997; Patton, 2009)³, individuals who display such behavior may find it difficult to meet the requirements of a regular work environment (Barkley and Murphy, 2010). For example, adults who are diagnosed with ADHD are found less often among professionals (e.g., doctors, lawyers, educators) and more often in lower-ranked occupational positions (de Graaf et al., 2008; Mannuzza et al., 1997) and among the unemployed (Kessler et al., 2005). Their underrepresentation in more promising and higher ranked positions may be explained by the increased intensity and complexity of responsibilities that characterize positions at higher organizational levels, where the effectiveness of coping mechanisms becomes more important (Nadeau, 2005). On the other hand, lower-level positions are often characterized by tasks that are repetitive or that lack stimulation, which is precisely the type of work that individuals with ADHD are reluctant to fulfill. According to the APA (2000, p.86): “..... *symptoms typically worsen in situations that require sustained attention or mental effort or that lack intrinsic appeal or novelty*”. Paradoxically, many adults who have ADHD tend to work in less challenging and highly structured work environments. The poor fit with their job may explain the relatively high incidence of sick leaves, reported underperformance, multiple job changes, and the higher preference to work part-time (Nadeau, 2005). ADHD may however fit well with working in a dynamic and flexible work environment where people are able to determine their own (order of) tasks and work at their own pace (Carroll and Ponterotto, 1998). Thus, from a ‘needs-supplies’ fit perspective it can be argued that because entrepreneurship is often perceived as a stimulating occupation that lacks routines and that is characterized by

³ ADHD ‘deficiencies’ are related to problems with the executive functions: i.e., working memory, self-regulation of affect-motivation-arousal, internalization of speech, and reconstitution (Barkley, 1997).

flexible working hours, it may be a preferred occupation among (young) adults who demonstrate high levels of ADHD-like behavior.

Entrepreneurship does not only fit with the needs of individuals with ADHD because of the absence of a formally structured work environment, it also requires capabilities commonly present in individuals with ADHD. For example, resilience to disappointments and the ability to ‘bounce back’ by continually assessing, reassessing and adapting to changing situations is not only common among individuals with ADHD, it is also typical for entrepreneurs (Young, 2005). In addition, the (pro)active orientation that is considered essential to (successful) entrepreneurship (Sarasvathy, 2001), is frequently present in individuals with ADHD (Hartmann, 2002). Finally, there is evidence of a positive relation with creative thinking (White and Shah, 2011, 2006; Kirby and Honeywood, 2007) which is an indispensable ingredient for opportunity *recognition* and/or opportunity *creation* via innovation (Amabile et al., 1996; Ardichvili et al., 2003; Ward, 2004), and risk taking (Toplak et al., 2005; Bechara et al., 1997; Mäntylä et al., 2012), which is characteristic of entrepreneurship (Stewart and Roth, 2001). Thus, from a ‘demands-abilities’ fit perspective it can be argued that entrepreneurship allows people who demonstrate high levels of ADHD-like behavior to exploit their strengths.

Summarizing, an entrepreneurial career appears desirable and feasible for individuals who exhibit high levels of ADHD-like behavior. We therefore expect these individuals to have a preference for self-employment over wage-employment and derive the following hypothesis:

H1: The level of ADHD-like behavior is positively related to entrepreneurial intentions

2.3 The mediating role of need for independence, drive to innovate and risk tolerance

2.3.1. *Need for independence*

The desire for freedom and independence is seen as a universal reason for new venture creation, i.e., one that is stable across countries and gender (Shane et al., 1991). Autonomy reasons are among the most cited factors for preferring entrepreneurship over wage-employment (Kolvereid, 1996; Douglas and Shepherd, 2002), even though a self-employed person still answers to stakeholders (e.g., customers, suppliers, investors) (Katz, 1994).

According to Hartmann (2002), the strong sense of individualism and the ability to be a self-starter are recurring themes in the lives of adults who experience ADHD. Although they would benefit from close supervision, many of them run into problems in the communication with their supervisors, in particular when they are required to work on boring and repetitive tasks for longer periods of time (Mannuzza et al., 1993). Their impulsive nature makes them speak their minds, usually without carefully considering the consequences, thereby risking offending their supervisors. Consequently, it can be expected that they are more likely to prefer an occupation in which they have autonomy and do not frequently have to report to someone higher in hierarchy. Hence, we expect individuals who demonstrate ADHD-like behavior to prefer starting their own business over working for a boss. We derive the following hypothesis:

H2: The relationship between the level of ADHD-like behavior and entrepreneurial intentions is mediated by the need for independence

2.3.2 *Drive to innovate*

Ever since the publication of Schumpeter's *Theory of Economic Development* innovation is seen as a central feature of entrepreneurship. Schumpeter (1934, 1939) characterized the entrepreneur as someone who is 'mentally free', who enjoys to create and change, and who is not

afraid to show deviant behavior when pursuing something new. Carland et al. (1984) found that innovation and the preference for creative activity are critical factors distinguishing entrepreneurs from non-entrepreneurs. Creating something new is considered a common motive for pursuing a career in entrepreneurship (Carter et al. 2003; Cassar, 2007).

There is evidence of exceptional creativity and unconstrained thinking in people who have ADHD (Weiss, 1997). Research shows that adults with ADHD have a higher preference for idea generation as compared to problem clarification and idea development (White and Shah, 2011). The APA (2000, p. 86/7) notes that they are easily distracted when fulfilling “boring, repetitive” tasks and they tend to perform better when working in novel settings or engaging in activities that particularly interest them. Not only do they have a preference for more challenging and creative work, they also show higher levels of creative thinking and achievement (White and Shah, 2006; 2011). The creative drive and performance of adults with ADHD may be related to their ‘uninhibited imagination’. Creative thinking in individuals with ADHD is stimulated due to deficits in inhibition which make it difficult to focus and allow random thoughts to enter the mind, leading to new connections. Hypothesis 3 is formulated as follows:

H3: The relationship between the level of ADHD-like behavior and entrepreneurial intentions is mediated by the drive to innovate

2.3.3 Risk tolerance

Traditionally, risk taking has been associated with entrepreneurship. In his seminal work *Risk, Uncertainty and Profit*, Knight (1921) pointed out that, unlike managers, entrepreneurs make business decisions in uncertain situations, thereby risking the loss of their investment. Yet, empirical research reveals conflicting findings, with some studies reporting a higher risk-taking

propensity of entrepreneurs as compared to the general population or managers (e.g., Stewart et al., 1998), whilst others report no significant differences (e.g., Brockhaus, 1980). According to Stewart and Roth (2001) it depends on the type of entrepreneur; they demonstrate that entrepreneurs are equipped with a higher risk propensity than managers, but that this difference is more pronounced for ‘growth oriented’ entrepreneurs than for ‘income-oriented’ small business owners. Recent meta-analyses provide evidence that entrepreneurs are indeed more tolerant of risk than others (Rauch and Frese, 2007; Stewart and Roth, 2001; 2004).

Risk tolerance has also been associated with ADHD. For example, Olazagasti et al. (2013) find a positive link between the occurrence of ADHD in children and risk-taking in adulthood. Ryb et al. (2006) report a higher incidence of low risk perception and high impulsivity in a group of individuals that displayed risky driving behaviors. In line with Damasio’s (1996) somatic marker hypothesis, individuals with ADHD appear to have weaker somatic and physiological cues to guide risky decisions (Mäntylä et al., 2012; Bechara et al., 1997; Toplak et al., 2005). This makes them relatively tolerant of risk, which translates into an attraction to more risky jobs such as sales, stock brokerage and entrepreneurial ventures (Weiss and Murray, 2003). We formulate Hypothesis 4 as follows:

H4: The relationship between the level of ADHD-like behavior and entrepreneurial intentions is mediated by risk tolerance

3. Method

3.1 Data collection

To test our hypotheses we use data from the Global University Entrepreneurial Spirit Students’ Survey (GUESSS) for 2011. The purpose of this survey is the examination of career

aspirations and, specifically, the entrepreneurial intentions of students in higher education. For this study we rely on data collected among 13,121 students at 38 universities (of applied science) in the Netherlands. Between March and June 2011 a link to an online questionnaire was distributed among students of different faculties, study levels (i.e., undergraduate, graduate, doctorate, post-doc, MBA) and study backgrounds. Approximately one month after the initial mailing, a reminder was sent out. To motivate students to participate in the online survey two I pads 2.0 were raffled among the participants who completed the survey. The final response rate for universities that systematically collected data among students of one or more faculties amounts to 7.4 percent⁴. This is an acceptable response rate given that only one reminder was sent out and a number of universities did not send out the link to the online survey via direct mailing but distributed it via Intranet or in a newsletter, resulting in a lower response rate.

To prevent self-selection of students who already have entrepreneurial intentions or who are already running their own business during their studies, the survey was introduced as focusing on future career paths in general, without explicitly stating its interest in entrepreneurship.

Given that both our dependent and independent variables are measured in the same sample and at the same point in time, our results might be subject to common method bias (Podsakoff et al., 2003). To diagnose the extent of common method variance, we performed Harman's one-factor test which is based on an exploratory factor analysis across all variables included in our regression analysis. The unrotated factor solution yields seven factors with an Eigenvalue larger than 1.0. The largest factor (Eigenvalue=3.08) accounts for 13.93% of inter-

⁴ For the calculation of this response rate educational institutions with no systematic data collection and those with less than twenty respondents have been excluded. Note that in the analysis these observations are combined in the category 'other educational institutions' (N=132).

item covariance. The extent of common method variance is comparatively low. Next to the Harman's one-factor test, we performed partial correlation procedures (Podsakoff et al., 2003) to control for common method variance in our regression models. We used exploratory factor analysis to identify a latent common method factor and inserted the corresponding factor values into our regression models. The latent common method factor did not show a significant effect on the dependent variable; the effects of the independent variables were similar when compared to the effects in the main regression analyses. Common method bias therefore seems not to be of major concern.

3.2 Measures

3.2.1 Dependent variable

To measure entrepreneurial intentions students were presented with the following question: "*Which career path do you intend to pursue right after completion of your studies?*" Respondents could choose one option from the following answer categories: *employee* [small to medium-sized firm (1-249 employees), large firm (> 250 employees), academia, public service]; *founder* [continue an already founded firm; found my own firm; start as freelancer; found a franchise company]; *successor* [continue family firm; take over a non-family controlled company]; or *no professional career in mind* [travelling, family activities, don't know (yet), others]. We create a dichotomous variable where '1' represents entrepreneurial intentions as a prospective founder (i.e., self-employment), and '0' denotes prospective employees. About 70% of the respondents prefer to have a wage job directly after studies, while 8% prefers to start their own company. This percentage of intentional founders is comparable to the average level of start-up intentions in the Netherlands, which amounts to about 10 percent (van der Zwan et al.,

2012). We exclude the intentional successors of family and/or and non-family firms (1.46%) as well as the students without a profession in mind (20.97%), and arrive at a sample of 10,178 students who make a clear occupational choice between wage- and self-employment.

3.2.2 Independent variable

To measure the level of ADHD-like behavior we use the World Health Organization ADHD Self-Report Scale (i.e., ASRS-v1.1 screener) which consists of six out of the eighteen DSM-IV TR criteria that were found most predictive of symptoms consistent with ADHD⁵. The ASRS-v1.1 scale has been proven effective in screening adults for ADHD (Kessler et al., 2007, 2005; Matza et al., 2011). Students checked the response that best described how they felt and conducted themselves over the past six months on a 5-point Likert scale (1=Never to 5=Very often). The ASRS-v1.1 scale includes the following six questions: (1) *How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?;* (2) *How often do you have difficulty getting things in order when you have to do a task that requires organization?;* (3) *How often do you have problems remembering appointments or obligations?;* (4) *When you have a task that requires a lot of thought, how often do you avoid or delay getting started?;* (5) *How often do you fidget or squirm (move) with your hands or feet when you have to sit down for a long time?;* and (6) *How often do you feel overly active and compelled to do things, like you were driven by a motor?* The first four questions capture the inattentive type of ADHD, while the latter two refer to the hyperactive type. Though the Cronbach alpha of the ASRS-v1.1 scale amounts to only 0.59, it is still around the lower bound of reported alphas for the ASRS screener questions reported in Kessler et al. (2007). They report

⁵ See: <http://www.hcp.med.harvard.edu/ncs/ftpd/ADHD/6Question-ADHD-ASRS-v1-1.pdf>

Cronbach alphas between 0.63 and 0.72 in different adult populations. In general, two main methods of scoring have been employed in the scales used for identifying ADHD in adults; a symptom count and a continuous scoring method (Taylor et al., 2011). Because we do *not* aim to actually screen students for ADHD, but want to examine the link between the level of ADHD-like behavior and entrepreneurial career intentions, we compare individuals on their average score on the six items of the ASRS-v1.1 screener.

As a robustness check we examine the relation between ADHD and entrepreneurial intentions for the extreme cases, i.e., individuals who would screen ADHD positive or negative according to the ASRS-v1.1 screening scale. This binary variable is measured according to the official ASRS-v1.1 scoring method; i.e., adding the scores above the threshold levels for the six items. For the first three items ('trouble wrapping up details'; 'difficulty getting things in order'; 'problems remembering appointments') the threshold is '3' or higher (i.e., sometimes, often or very often). For the last three items ('delay tasks requiring thought'; 'fidget or squirm when sitting down'; 'overly active and compelled to do things') the threshold is '4' or higher (i.e., often or very often). Individuals with four or more checks above threshold levels are screened positive, otherwise they are screened negative.

Finally, we test the effect of the separate subscales of the ASRS-v1.1 screener. A factor analysis shows that the items of the scale load on two different types of behavior: inattentive behavior (items 1 to 4) and hyperactive behavior (items 5 and 6). This is in accordance with Hesse (2013) who argues that the ASRS-v1.1 scale is two-dimensional and captures two latent factors. The subscales however have a low reliability in our sample of students; the Cronbach alpha for inattentive and hyperactive behavior amount to 0.62 and 0.43, respectively.

3.2.3 Mediators

Based on Carter et al. (2003) the need for independence and the drive to innovate are measured as multi-item scales. Students answered the question: *'How important are the following motives for your future work and career path?'* with a score on a 7-point Likert scale. The need for independence is calculated as the average score on the items: *'Be my own boss'* and *'Get a greater flexibility for my personal life'* ($\alpha=0.52$). Innovative drive is calculated as the average score on the items: *'Be innovative, at the forefront of technology'* and *'Develop an idea for a product'* ($\alpha=0.76$). Finally, risk tolerance is measured with the single-item experimentally validated measure as proposed by Dohmen et al. (2011): *'How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?'* with response categories '0' (risk averse) to '10' (fully prepared to take risk). This measure was found highly correlated with economic measures on risk-taking behavior with real money at stake (Dohmen et al., 2011).

3.2.4 Control variables

Given the importance of the Theory of Planned Behavior (Ajzen, 1991) for explaining entrepreneurial intentions, we control for attitude towards entrepreneurship (average score on four items, e.g., *'A career as entrepreneur is attractive to me'*, $\alpha=0.94$), social norms (measured by the opinions of parents/family; friends/fellow students; people important to the individual in general, $\alpha=0.86$), and compliance motivation (average of the opinions of the aforementioned groups, $\alpha=0.72$). We use an adapted version of the domain-specific entrepreneurial self-efficacy measure of Chen et al. (1998), which reflects the degree of certainty in performing twelve entrepreneurial tasks, e.g., *'perform financial analysis'*, *'take calculated risks'*, and *'develop new products and services'*, $\alpha=0.85$). Locus of control is measured using an abbreviated version of Levenson (1973) that allows for distinguishing between domain-specific self-confidence and the

general believe of individuals they can shape their own destiny (e.g., Zellweger et al., 2011). We calculate the average score on nine items, e.g., ‘*When I get what I want, it is usually because I’m lucky*’ and ‘*I feel like what happens in my life is mostly determined by powerful people*’ ($\alpha=0.72$). Furthermore, we control for individuals’ perceived risk of entrepreneurship by including the score on the following question: ‘*How risky do you perceive starting your own company?*’ (0 = not risky ... 10=very risky). We include a set of socio-demographic controls: gender (female=1), age (year of birth), marital status (married or divorced=0; single=1), self-employed parents (currently or in the past) and ethnicity (Dutch, Turkish, German, Moroccan, Polish) as well as study-related variables: i.e., self-reported grade point average (on a scale of 1 to 10)⁶, fourteen study fields⁷ and five study levels (Undergraduate; Graduate; PhD/Doctorate; Faculty/Post-doc). Finally, to take account of variation in data collection methods, we include 21 dummies for the universities that systematically gathered data among their students.⁸

4. Results

4.1 Descriptive analysis

In our data sample 89.3% of the students want to work in wage-employment and 10.7% aims to start a business directly after studies. About 70 percent of the students in the survey are undergraduate students and 30 percent are graduate students. With respect to the field of study,

⁶ Note that ‘10’ is the highest attainable grade in the Netherlands.

⁷ The 14 study fields include Linguistics; Culture (incl. religion, philosophy, psychology); Education/Pedagogy; Sports; Medicine & Health Science; Law; Economics; Management/Business Administration; Other Social Sciences (e.g., Sociology, Political Science); Mathematics and Natural Sciences; Engineering (incl. Architecture); Computer Science/Informatics; Agriculture, Forestry & Nutrition; Art.

⁸ The 21 educational institutions include Eindhoven Univ. of Technology; Erasmus Univ. Rotterdam; Maastricht University; Nyenrode Business School; Radboud Univ. Nijmegen; Tilburg University; Univ. of Amsterdam; Univ. of Groningen; Univ. of Twente; Utrecht University; VU Univ. Amsterdam; Amsterdam Univ. of Appl. Sciences; Breda Univ. of Appl. Sciences; the Hague Univ. of Appl. Sciences; the Hague Univ. of Hospitality Mgt, HAN Univ. of Appl. Sciences; Hanze Univ. of Appl. Sciences; InHolland Univ. of Appl. Sciences; Univ. of Appl. Sciences Utrecht; Zuyd Univ. of Appl. Sciences; Other (i.e., schools with no systematic data collection or ≤ 20 responses).

we see an equal distribution across ‘Business and Economics’ and ‘Natural Sciences’ students, accounting for 37.8% and 36.3%, respectively. The remaining 25% are students in ‘Social Sciences’. Slightly more female (55%) than male students (45%) participated in the survey.

The *mean* score on the ASRS-v1.1 scale is 2.57, which is below the minimum threshold level. Based on the *binary* variable 15.6% of the students in our sample is screened positive for ADHD. Using the same scale for screening a sample of about 600 subscribers to a large health care plan in the US, Kessler et al. (2007) report a similar ADHD prevalence rate of 14%. Faraone and Biederman (2005) find that 16.4% of the adults score positive on “broad ADHD” – which they propose as a screening tool for ADHD. At the same time the clinical prevalence rate of adult ADHD has been consistently reported in the range between 1 and 6 percent (Faraone and Biederman, 2005; Kessler et al., 2006; de Graaf et al., 2008). As compared to the prevalence of screen positives for the ASRS-v1.1 screener, the clinical ADHD prevalence rate is lower due to the fact that screening identifies individuals who are likely to have ADHD, but are not necessarily clinically diagnosed with ADHD.

Correlation analysis and the variance inflation factors (VIF) for our measures show that problems of multicollinearity are unlikely (See Table 1). The maximum VIF score is 2.31 for ‘Attitude’, and the highest Pearson correlation coefficient is that between ‘Need for independence’ and ‘Attitude’ ($r=0.56$; $p< 0.05$).

> INSERT TABLE 1 HERE <

4.2 Hypothesis testing

To test our first hypothesis, stating that the level of ADHD-like behavior is positively related to entrepreneurial intentions, we estimate stepwise binary logistic regressions. Control variables are entered in Step 1 (Model 1 in Table 2) and ADHD-like behavior (measured by the

mean score on the ASRS-v1.1 screener) is entered in Step 2 (Model 2 in Table 2). We find that students, who have a higher average score on the ASRS-v1.1 scale and, thus, exhibit a higher level of ADHD-like behavior, are significantly more likely than their peers to have the intention to start and run their own business directly after their studies. This provides support for H1 ($\beta=0.229$; $p<0.001$). The regression coefficient of 0.229 is equivalent to an odds ratio of 1.257, which means that a unit increase in the mean ASRS-v1.1 score increases the odds of having entrepreneurial intentions by 26%. The Likelihood Ratio test shows that the inclusion of ADHD-like behavior in the analysis significantly improves our ability to predict entrepreneurial intentions ($LR\chi^2(1)=14.35$, $p<0.001$). To compare the proportion of variation in the outcome variable (entrepreneurial intentions) in the different models in Table 2, we use Pseudo R^2 , which improves from 0.173 (in Model 1) to 0.174 (in Model 2) resulting in a $\Delta R^2 = 0.001$.

With respect to our controls, the results in Table 2 show that the likelihood of entrepreneurial intentions is higher for male students; for students with self-employed parents; and for those who have a positive attitude towards entrepreneurship and a high level of entrepreneurial self-efficacy. The negative effect of compliance with social norms indicates that the compliance with what other people think of the choice for an entrepreneurial career limits an individual's intentions to start a business directly after graduation.

> INSERT TABLE 2 HERE <

To test hypotheses 2 through 4, we follow Kenny et al. (1998) as well as Baron and Kenny (1986). According to Baron and Kenny (1986), a mediating effect exists when three criteria are met: (1) the predictor is related to the mediator, (2) the mediator is related to the dependent variable, and (3) the effect of the predictor on the dependent variable is smaller when including the mediator, when compared to the effect of the predictor in (1). Given that our

mediators (need for independence, innovative drive and risk tolerance) are significantly correlated, we test their mediating effects separately. The results of the mediation analyses are reported in Table 3. The Stata program *binary_mediation* is used to conduct the analyses. Standard errors and significance levels for the direct and indirect effects are calculated using bootstrapping (500 replications).

To test H2-H4 we regressed the dependent variable entrepreneurial intentions (EI) on the predictor ADHD-like behavior and the controls in Model 1, then the mediator (need for independence) on the predictor and the control variables in Model 2, and finally, the dependent variable on the predictor, control variables and the mediator (need for independence) in Model 5. The first condition for mediation is satisfied because ADHD-like behavior is significantly related to entrepreneurial intentions (Model 1 in Table 3: $\beta=0.260$; $p<0.001$). The second condition for mediation requires that ADHD-like behavior is significantly related to the need for independence. We see from Table 3 that this condition is met (Model 2: $\beta=0.059$; $p<0.001$). With respect to the third condition, need for independence is positively related to entrepreneurial intentions after controlling for ADHD-like behavior (Model 5: $\beta=0.242$; $p<0.001$). However, as ADHD-like behavior is still significantly related to entrepreneurial intentions (Model 5: $\beta=0.247$; $p<0.001$), the (fourth) condition for complete mediation is not met. We find that need for independence partially mediates the relationship between ADHD-like behavior and entrepreneurial intentions. Testing the indirect effect with bootstrapping (500 replications) confirms that the need for independence significantly mediates the relationship between the level of ADHD-like behavior and entrepreneurial intentions (observed coefficient=0.010; bootstrap SE=0.002). Thus, our findings confirm H2. In total, the need for independence explains about 5.5 percent of the total effect of the level of ADHD-like behavior on entrepreneurial intentions.

Similarly, we test H3, stating that innovative drive mediates the relationship between the level of ADHD-like behavior and entrepreneurial intentions. Model 3 in Table 3 shows that ADHD-like behavior is significantly related to innovative drive ($\beta=0.164$; $p<0.001$) and Model 6 in Table 3 shows that innovative drive is significantly related to entrepreneurial intentions while controlling for ADHD-like behavior ($\beta=0.060$; $p<0.05$). However, generating standard errors and a confidence interval via bootstrapping shows that the indirect effect is *not* significant (observed coefficient=0.000, bootstrap SE=0.001). Hence, we do not find support for H3.

In H4 we hypothesize that risk tolerance mediates the relationship between the level of ADHD-like behavior and entrepreneurial intentions. Model 4 in Table 3 shows that the average score on the ASRS-v1.1 scale is positively related to risk tolerance ($\beta=0.185$; $p<0.001$) and Model 7 shows that risk tolerance is positively related to entrepreneurial intentions while controlling for ADHD-like behavior ($\beta=0.136$; $p<0.001$). However, since ADHD-like behavior is still significantly related to entrepreneurial intentions in Model 7 ($\beta=0.244$; $p<0.001$), there is only evidence of partial mediation. Testing the mediation effect via bootstrapping shows that it is significant (observed coefficient=0.005, bootstrap SE=0.001). Hence, we find support for hypothesis H4. Risk tolerance explains 9.4 percent of the total effect of the level of ADHD-like behavior on entrepreneurial intentions.

Model 8 in Table 3 shows that all three mediators – need for independence, drive to innovate, and risk tolerance – together explain 15.9 percent of the total relationship between the level of ADHD-like behavior and entrepreneurial intentions.

> INSERT TABLE 3 HERE <

Additional analyses

To test for the robustness of our results, we run two additional analyses. First, we investigate how two other configurations of our independent variable (i.e., binary score and separate scores for inattentive and hyperactive behavior) influence entrepreneurial intentions. Second, we test whether our main results hold if we predict actual entrepreneurial *status* instead of entrepreneurial *intentions*.

Table 4 reports the results of the first robustness check, i.e., whether the positive relationship with entrepreneurial intentions still holds when we replace the mean score on the ASRS-v1.1 scale with a binary score that distinguishes between individuals who are screened positive or negative on ADHD. The latter is a more conservative operationalization of the independent variable. Model (a) in Table 4 shows that individuals with ADHD have higher entrepreneurial intentions than individuals without ADHD ($\beta=0.309$; $p<0.001$). The coefficient of 0.309 refers to an odds ratio of 1.362, indicating that ADHD increases the odds of having entrepreneurial intentions by 36%.

We also estimate a model in which we determine the effects of inattentive and hyperactive behavior separately. We calculate separate mean scores for the items related to inattentive and hyperactive behavior, and relate each of them separately to entrepreneurial intentions. The results are presented in Table 4 (model b). Here we see that inattentive behavior, and not hyperactive behavior, is positively related to entrepreneurial intentions ($\beta=0.237$; $p<0.001$).

> INSERT TABLE 4 HERE <

In a second robustness check we test whether ADHD-like behavior (mean score on the ASRS-v1.1 scale), ADHD (binary score on the ASRS-v1.1 scale) and separate inattentive and hyperactive behavior are positively related to entrepreneurial *status*. We measure entrepreneurial

status with a binary variable where a score of '1' refers to students who run their own business during their studies and '0' refers to the other students. Model (b) in Table 5 shows that ADHD-like behavior is positively related to entrepreneurial status ($\beta=0.246$; $p<0.05$). However, this relationship disappears if we include the binary measure of ADHD (Model c in Table 5; $\beta=0.186$; $p>0.05$). Finally, Model (d) in Table 5 shows that only inattentive behavior is positively related to entrepreneurial status ($\beta=0.222$; $p<0.01$).

> INSERT TABLE 5 HERE <

5. Discussion and conclusion

Inspired by entrepreneurial icons such as Richard Branson and Donald Trump, the aim of this study is to examine the attraction an entrepreneurial career can have on young adults who also exhibit ADHD-like behavior. We investigate the prospective careers of over 10,000 university students by linking their entrepreneurial intentions to the self-reported level of ADHD-like behavior, and examine the mediating effects of the need for independence and the drive to innovate and risk tolerance.

We find that the degree to which students exhibit ADHD-like behavior increases their intention to start a business directly after their studies. This is partly due to the attractiveness of an entrepreneurial career in terms of a 'needs-supplies' fit (entrepreneurship fulfills the need for independence) and a 'demands-abilities' fit (entrepreneurship requires risk tolerance). Not only does ADHD-like behavior appear to enhance entrepreneurial career *intentions*, our study also provides evidence of a positive link with entrepreneurial *status*. That is, students who exhibit higher levels of ADHD-like behavior are more likely to start and run a business during their studies. Hence, the level of ADHD-like behavior does not only appear to have an effect in the

career decision stage, but also on actual entrepreneurial behavior (in the form of student entrepreneurship).

Disentangling inattentive and hyperactive behavior in explaining students' preferred careers, show that inattentive (rather than hyperactive) behavior makes students more prone to pursuing an entrepreneurial career. Apparently, the lack of sustained attention increases the willingness of students to opt for an entrepreneurial career, possibly because they are hesitant to enter a regulated work environment that leaves little room for a flexible working schedule. The absence of an effect for hyperactive behavior may be explained by its measurement. The two items 'fidget and squirm' and 'overly active' emphasize physical or motoric components of hyperactive behavior, the intensity and frequency of which typically decrease in adulthood (Gibbins et al., 2010). Instead, research suggests that adults tend to exhibit relatively high levels of cognitive hyperactivity or internal restlessness (Weyandt et al., 2003). Precisely these cognitive aspects of hyperactivity may have more relevance for explaining the intention to become entrepreneur than hyperactive behavior, which in essence is a cognitive process (Ajzen, 1991).

A focus on the value (rather than the cost) of ADHD is at the heart of a recent stream of literature in the field of psychiatry, i.e., Darwinian Psychiatry, arguing that the persistence of such mental 'disorders' serves a purpose (Brüne et al., 2012; Troisi and McGuire, 2002). According to this research stream, psychological or genetic variations that are mostly disruptive for an individual's work and private life, can (under some circumstances or in mild forms) be beneficial for individual 'adaptation' or survival. In this view, (young) adults who experience high levels of ADHD-like behavior may be regarded as 'orchids', who (unlike 'dandelions', that

can grow and prosper anywhere) are fragile and unstable, but can blossom beautifully in the right environment (Dobb, 2009).

6. Implications

Our findings have implications for entrepreneurship educators and people who have to decide upon a career and exhibit high levels ADHD-like behavior. Considering the potential fit with an entrepreneurial career, it is important that individuals who show high levels of ADHD-like behavior carefully reflect on what it is that inspires and motivates them in a (future) profession, and that the identified preferred work characteristics may offer them guidance when deciding upon a career. Furthermore, entrepreneurship educators should not only be aware of the challenges ADHD-like behavior pose, but also understand and facilitate their ‘blessings’. Because an entrepreneurial career appears to fulfill the need for independence and benefits from the risk tolerance of young adults who demonstrate ADHD-like behavior, educators may want to stimulate those ‘energetic’ youngsters to start up their own business instead of embarking on a career in wage-employment where they are confronted with the challenges of a highly structured work environment.

In case there is a drive for entrepreneurship, educators may guide students who show ADHD-like behavior to (further) develop their coping mechanisms to deal with their weaknesses and find ways to exploit their exceptional strengths. Some individuals with high levels of ADHD-like behavior may thrive in a start-up team in which their positive attributes (e.g., creativity, energy, determination) can contribute to the success of the entrepreneurial team effort, while their weaknesses (e.g., poor organization, lack of attention, less developed social skills) are compensated for by other team members. The likelihood that individuals who exhibit high levels

of ADHD-like behavior have problems with authority and the formal arrangements characterizing a regular work environment does not necessarily mean they would not benefit from being embedded in a more structured group or organizational context.

Given the awakening interest in the positive contribution of ADHD in the workplace (*The Economist*, 2012), it is worthwhile to not merely put effort in helping (young) adults with a ‘deviating’ behavioral profile to develop their entrepreneurial skills and prepare them for an entrepreneurial career, but also to create (more) awareness of the potential value these individuals can have for established organizations, and to find out how we can facilitate them to discover and achieve their maximum potential within different work settings.

7. Limitations and future research directions

Our study has some limitations. First, we acknowledge that the effect size of our measure of ADHD-like behavior in explaining entrepreneurial intentions is small (Δ Pseudo $R^2 = 0.001$; Cohen’s $f^2 = 0.001$ [Cohen, 1988]). However, we compared the effect size of ADHD-like behavior (i.e., mean score on the ASRS-v1.1 screener) with the effect sizes of other well-known predictors of entrepreneurial intentions. Those effect sizes ranged from $f^2 = 0.001$ for the variables ‘female’ and ‘self-employed parents’ to $f^2 = 0.008$ for the need for independence. Hence, although the effect of the level of ADHD-like behavior on entrepreneurial intentions is small, the effect is comparable to that of factors such as gender or self-employed parents, that have received a lot of attention in the literature and are known for their stable influence on entrepreneurial intentions (e.g., Laspita et al., 2012). We are therefore confident that ADHD-like behavior is a meaningful predictor of entrepreneurial intentions.

Second, we are aware of the low reliability of our scale measuring need for independence and the level of ADHD-like behavior ($\alpha = 0.52$ and 0.59 , respectively). We however decided to keep the original scales for both measures. The scale capturing need for independence stems from Carter et al. (2003), reporting similar low Cronbach alphas of 0.58 in a sample of 558 individuals (some of whom were in the process of starting a company). According to Carter et al. (2003) it is always difficult to obtain high reliability scores when scales consist of only two items. Given that the items of the need for independence scale are in line with its theoretical basis, we choose to use the scale despite its marginal reliability. Furthermore, the Cronbach alpha of our measure of ADHD-like behavior is in the lower bound of reliability scores reported in Kessler et al. (2007), ranging from 0.63 to 0.72 in different adult populations.

The outcomes of this study open up important avenues for further research. First, more research is needed to assess the influence of ADHD and ADHD-like behavior on entrepreneurial intentions in non-student samples, including among employed and unemployed individuals. Indeed, students are a distinct group of adults who may exhibit more efficient coping mechanisms. Our sample may include “success” examples, as it focuses on individuals who pursue a graduate education. While ADHD is reported to have a negative impact on academic performance, there is empirical evidence that the severity of its consequences decreases with age, as adults learn to manage their behavior and impulses more effectively (Mannuzza et al., 1993). This would imply that pursuing graduate education should not be an insurmountable barrier for young adults who exhibit high levels of ADHD-like behavior. Investigating their effects on entrepreneurial intentions is particularly relevant considering the positive role education can play in stimulating the pursuit of an entrepreneurial career. Independent of the level of ADHD-like behavior, students in higher education may generally be better equipped to pursue a successful

entrepreneurial career than others. Research provides evidence that higher educated entrepreneurs outperform their peers (Gimeno, Folta and Cooper, 1997) and that the returns to formal education are higher for entrepreneurs than for employees (van Praag, van Witteloostuijn and van der Sluis, 2013). Hence, promoting entrepreneurship among students and young graduates would pay off both from the perspective of policy makers and that of individuals who are deciding on the type of career they want to pursue.

Another direction for further research would be to investigate how entrepreneurs who demonstrate high levels of ADHD-like behavior perform compared to other entrepreneurs. Assuming that a person-career fit leads to more work satisfaction and better performance, the exceptional strengths of individuals who display ADHD-like behavior might lead them to outperform other entrepreneurs in certain domains, while their weaknesses may lead them to underperform elsewhere. The question arises whether adults who demonstrate ADHD-like behavior are also persistent, i.e., do they survive the ups and downs of the entrepreneurial journey in the long run? Our study does not look into the growth potential or actual performance of the ventures founded by adults who exhibit different levels of ADHD-like behavior. Further research, using more elaborate measures, including impulsive behavior, is needed to determine whether adults demonstrating ADHD-like behavior not only have entrepreneurial intentions but are also well equipped to start and manage successful new ventures.

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Table 1: Correlation table

		Mean	Sd.	VIF	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Entrepreneurial intentions	0.11	0.31																			
2	ADHD-like behavior	2.57	0.60	1.18	0.06																	
3	Independence	4.76	1.28	1.56	0.19	0.04																
4	Innovative drive	4.00	1.61	1.41	0.13	0.07	0.35															
5	Risk tolerance	5.88	2.07	1.25	0.16	0.01	0.25	0.24														
6	Perceived risk	6.24	2.05	1.04	-0.11	0.05	-0.09	-0.07	-0.05													
7	Female	0.55	0.50	1.17	-0.08	-0.10	-0.10	-0.26	-0.08	0.06												
8	Age (yrs)	23.19	4.95	1.66	0.08	-0.02	0.06	0.01	0.05	-0.04	-0.08											
9	Single	0.93	0.26	1.50	-0.07	0.02	-0.03	0.03	-0.01	0.05	0.01	-0.57										
10	Self-employed parents	0.28	0.45	1.04	0.07	0.004	0.11	0.06	0.10	-0.05	0.02	-0.08	0.07									
11	Dutch	0.84	0.37	1.10	0.01	0.02	-0.19	-0.12	-0.07	-0.01	-0.02	-0.02	-0.02	-0.04								
12	Attitude	4.23	1.57	2.31	0.22	0.06	0.56	0.41	0.34	-0.12	-0.25	0.03	-0.01	0.14	-0.15							
13	Social norms	5.48	0.98	1.43	0.07	-0.04	0.32	0.20	0.20	-0.07	-0.07	-0.05	0.03	0.13	-0.08	0.47						
14	Compliance	5.18	1.08	1.10	-0.06	0.004	0.04	0.02	-0.03	0.04	0.11	-0.10	0.08	0.04	-0.05	0.03	0.23					
15	Ent self-efficacy	4.49	0.87	2.20	0.19	-0.12	0.45	0.46	0.40	-0.13	-0.26	0.04	-0.02	0.13	-0.13	0.63	0.38	0.01				
16	Locus of control	3.08	0.72	1.20	0.01	0.30	0.01	0.05	-0.13	0.03	0.01	-0.07	0.02	-0.02	0.02	-0.02	-0.13	0.05	-0.18			
17	Study grade	7.29	0.70	1.11	-0.04	-0.18	-0.02	0.02	-0.03	0.05	0.04	0.05	-0.03	-0.002	-0.14	-0.04	-0.02	0.01	0.06	-0.15		
18	Management	0.19	0.39	1.11	0.02	-0.01	0.16	0.09	0.05	0.03	-0.12	-0.003	0.01	0.05	-0.17	0.22	0.13	0.03	0.23	-0.03	0.04	
19	Bachelor	0.68	0.47	1.15	0.06	0.05	0.03	0.01	0.05	-0.06	0.01	-0.28	0.08	0.03	0.07	0.04	0.05	-0.01	0.01	0.08	-0.17	-0.03

N=10,178; All correlations ≥ 0.02 are significant at 5% significance level; Sd.=standard deviation; VIF=variance inflation factor

Table 2: Binary logistic regression explaining entrepreneurial intentions

	Model 1 Coeff (SE)	Model 2 Coeff (SE)
ADHD-like behavior	.	0.229 (0.060)***
Need for independence	0.238 (0.037)***	0.234 (0.037)***
Innovative drive	0.034 (0.027)	0.030 (0.027)
Risk tolerance	0.135 (0.021)***	0.133 (0.021)***
Perceived risk	-0.126 (0.017)***	-0.129 (0.017)***
Female	-0.216 (0.079)**	-0.188 (0.079)*
Age (yrs)	0.022 (0.008)**	0.023 (0.008)**
Single	-0.291 (0.147)*	-0.292 (0.147)*
Self-employed parents	0.186 (0.075)*	0.185 (0.075)*
Nationality (5 dummies)	Included	Included
Attitude	0.334 (0.038)***	0.320 (0.038)***
Social norms	-0.211 (0.045)***	-0.204 (0.045)***
Compliance	-0.096 (0.032)**	-0.098 (0.032)**
Entrepr. self-efficacy	0.250 (0.061)***	0.287 (0.062)***
Locus of control	0.129 (0.051)*	0.084 (0.052)
Study grade	-0.152 (0.052)**	-0.130 (0.053)*
Study field (14 dummies)	Included	Included
Study level (4 dummies)	Included	Included
Educ. institution (20 dummies)	Included	Included
Constant	-3.330 (0.758)***	-4.061 (0.783)***
N (observations)	10,088	10,088
Log Likelihood	-2839.75	-2832.57
Pseudo R ²	0.173	0.174

Notes: SE = robust standard errors; ***p<0.001; ** p<0.01; * p<0.05

Table 3: Mediation analyses

Dependent variable	Model 1 Entrepreneurial intentions	Model 2 Need for independence	Model 3 Innovative drive	Model 4 Risk tolerance	Model 5 Entrepreneurial intentions	Model 6 Entrepreneurial intentions	Model 7 Entrepreneurial intentions	Model 8 Entrepreneurial intentions
ADHD-like behavior	0.260*** (0.060)	0.059*** (0.018)	0.164*** (0.024)	0.185*** (0.033)	0.247*** (0.060)	0.253*** (0.060)	0.244*** (0.060)	0.229*** (0.05)
Need for independence	.	.	.	.	0.242*** (0.036)	.	.	0.234*** (0.037)
Innovative drive	.	.	.	.	.	0.060* (0.027)	.	0.02 (0.02)
Risk tolerance	.	.	.	.	.	.	0.136*** (0.021)	0.133*** (0.021)
Controls	Included	Included	Included	Included	Included	Included	Included	Included
N observations	10,104	10,089	10,088	10,104	10,089	10,088	10,104	10,088
Likelihood-ratio test	p < 0.001	.	.	.	p < 0.001	p < 0.001	p < 0.001	p < 0.001
F test	.	p < 0.001	p < 0.001	p < 0.001	.	.	.	.
Log Likelihood	-2879.08	.	.	.	-2854.60	-2874.67	-2857.11	-2832.57
Pseudo R ²	0.161	.	.	.	0.168	0.162	0.168	0.174
Binary Mediation Test								
Direct effect					0.033 (0.015)*	0.041 (0.016)***	0.036 (0.016)*	0.031 (0.015)*
Indirect effect					0.010 (0.002)***	0.000 (0.001)	0.005 (0.001)***	0.013 (0.003)***
Total effect					0.043 (0.015)***	0.041 (0.016)***	0.041 (0.016)*	0.044 (0.015)***
Proportion of total effect mediated					0.055	0.038	0.094	0.159

Notes: This table shows coefficients and standard errors in parentheses; The Stata program binary_mediation was used. Standard errors and significance values for direct and indirect effects in models 5 to 8 are calculated using bootstrapping (500 replications); ***p<0.001; ** p<0.01; * p<0.05.

Table 4: Robustness tests for entrepreneurial intentions

Dependent variable	Model (a) Entrepreneurial intentions	Model (b) Entrepreneurial intentions
ADHD (binary score)	0.309 (0.091)***	.
Inattentive behavior	.	0.237 (0.055)***
Hyperactive behavior	.	0.003 (0.039)
Need for independence	0.236 (0.036)***	0.234 (0.037)***
Innovative drive	0.030 (0.027)	0.029 (0.027)
Risk tolerance	0.134 (0.021)***	0.133 (0.021)***
Perceived risk	-0.129 (0.017)***	-0.130 (0.017)***
Female	-0.196 (0.079)*	-0.174 (0.080)*
Age (yrs)	0.022 (0.008)**	0.022 (0.008)**
Single	-0.292 (0.147)*	-0.291 (0.147)*
Self-employed parents	0.189 (0.075)*	0.187 (0.075)*
Nationality (5 dummies)	Included	Included
Attitude	0.328 (0.038)***	0.321 (0.038)***
Social norms	-0.204 (0.045)***	-0.208 (0.045)***
Compliance	-0.098 (0.032)**	-0.100 (0.032)**
Entrepreneurial self-efficacy	0.267 (0.061)***	0.302 (0.062)***
Locus of control	0.103 (0.051)*	0.075 (0.052)
Study grade	-0.140 (0.052)**	-0.121 (0.053)*
Study field (14 dummies)	Included	Included
Study level (4 dummies)	Included	Included
Educ. institution (20 dummies)	Included	Included
Constant	-3.390 (0.759)***	-4.161 (0.785)***
N (observations)	10,088	10,088
-2 Log Likelihood	-2834.108	-2830.087
Pseudo R ²	0.174	0.175

Notes: This table shows coefficients and standard errors in parentheses; ***p<0.001; ** p<0.01; *p<0.0

Table 5: Robustness tests for entrepreneurial status

Dependent variable	Model (a) Entrepreneurial status	Model (b) Entrepreneurial status	Model (c) Entrepreneurial status	Model (d) Entrepreneurial status
ADHD-like behavior (mean score)	.	0.246 (0.098)*	.	.
ADHD (binary score)	.	.	0.186 (0.158)	.
Inattention	.	.	.	0.222 (0.089)**
Hyperactivity	.	.	.	0.032 (0.062)
Need for independence	0.032 (0.058)	0.026 (0.058)	0.030 (0.058)	0.026 (0.058)
Innovative drive	-0.021 (0.042)	-0.023 (0.042)	-0.022 (0.042)	-0.022 (0.042)
Risk tolerance	0.117 (0.034)***	0.115 (0.035)**	0.116 (0.034)**	0.115 (0.035)**
Perceived risk	-0.298 (0.026)***	-0.301 (0.026)***	-0.300 (0.026)***	-0.302 (0.026)***
Female	-0.671 (0.140)***	-0.638 (0.141)***	-0.660 (0.140)***	-0.631 (0.141)***
Age (yrs)	0.071 (0.011)***	0.072 (0.012)***	0.072 (0.012)***	0.072 (0.012)***
Single	-0.061 (0.237)	-0.057 (0.237)	-0.060 (0.237)	-0.055 (0.237)
Self-employed parents	0.395 (0.121)***	0.396 (0.121)**	0.397 (0.121)**	0.400 (0.121)**
Nationality (5 dummies)	Included	Included	Included	Included
Attitude	0.463 (0.069)***	0.449 (0.069)	0.460 (0.069)***	0.449 (0.069)***
Social norms	0.039 (0.076)	0.050 (0.076)	0.043 (0.076)	0.049 (0.076)
Compliance	-0.084 (0.049)	-0.084 (0.049)	-0.084 (0.049)	-0.086 (0.049)
Entrepreneurial self-efficacy	0.580 (0.102)***	0.623 (0.104)***	0.590 (0.103)***	0.635 (0.105)***
Locus of control	-0.080 (0.083)	-0.125 (0.085)	-0.093 (0.084)	-0.133 (0.085)
Study grade	0.0217 (0.090)**	0.241 (0.090)***	0.222 (0.090)**	0.244 (0.090)***
Study field (14 dummies)	Included	Included	Included	Included
Study level (4 dummies)	Included	Included	Included	Included
Educ. institution (20 dummies)	Included	Included	Included	Included
Constant	-10.628 (1.255)***	-11.506 (1.306)***	-10.689 (1.256)***	-11.546 (1.301)***
N (observations)	12,905	12,905	12,905	12,905
-2 Log Likelihood	-1230.43	-1227.320	-1229.764	-1226.862
Pseudo R ²	0.269	0.271	0.269	0.271

Notes: This table shows coefficients and standard errors in parentheses; ***p<0.001; ** p<0.01; *p<0.05

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