



# ADHD symptoms, entrepreneurial passion, and entrepreneurial performance

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**Abstract** Recent studies have substantially enhanced our understanding of attention deficit and hyperactivity disorder (ADHD) in entrepreneurship—articulating the theoretical relevance of ADHD-type traits in entrepreneurship and confirming the positive linkages between ADHD symptoms/diagnosis and entrepreneurial intentions and behavior. However, how and why some people with ADHD symptoms run successful ventures, while other entrepreneurs fail to perform well, is still not well established. Our study builds on a Gestalt perspective that integrates person–environment fit and broaden-and-build theorizing, and

proposes that strong positive emotions enable entrepreneurs with ADHD symptoms (at the subclinical level) to mitigate/reinforce the effect of ADHD’s trait-specific weaknesses/strengths to achieve entrepreneurial performance. Relying on fuzzy-set methodology, our findings indicate that for entrepreneurs with ADHD symptoms, entrepreneurial performance occurs when they simultaneously experience passion for founding and developing. This passion configuration is unique to successful ADHD-type entrepreneurs. As such, this study offers novel theoretical and empirical insights as well as implications for practitioners.

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**Plain English Summary** Do people with ADHD perform well in entrepreneurship? Our research shows how ADHD symptoms relate to entrepreneurial performance finding that passion is important. Entrepreneurs who are highly and thereby ambidextrously passionate for growing their businesses and for founding activities while lacking intense positive feelings for coming up with new ideas can benefit from ADHD. These results are important for people with ADHD and their loved ones.

**Keywords** Attention deficit/hyperactivity disorder · ADHD · Entrepreneurial performance · Entrepreneurial passion · Entrepreneurship · fsQCA

**JEL classification** L26

## 1 Introduction

Scholarly interest in the potential functionality of mental health conditions in entrepreneurship (Wiklund et al. 2018) and particularly the neurodevelopmental condition attention deficit and hyperactivity disorder (ADHD) is rapidly increasing (for an overview, see Lerner et al. 2019). This is because traits associated with ADHD are dysfunctional across a wide variety of contexts, but may potentially be functional in entrepreneurship. Research indeed suggests that entrepreneurship is attractive to people with ADHD symptoms including higher entrepreneurial intentions (Verheul et al. 2015) and a higher probability of entry into entrepreneurship (Verheul et al. 2016). However, how ADHD symptoms associate with firm-level outcomes is still not well established (Wiklund et al. 2018; Yu et al. 2019). It seems that the traits through which ADHD symptoms relate to entrepreneurial performance are complex and are likely both positive and negative.

People with ADHD tend to approach new situations very positively and do not premeditate when they face an uncertain opportunity, but they have problems sustaining focus and persevering (Wiklund et al. 2017). At the same time, we know that passion for specific entrepreneurial domains increases sustained focus and perseverance (Cardon et al. 2013) so that entrepreneurial passion may mitigate the weaknesses associated with ADHD symptoms. Thus, considering ADHD symptoms in conjunction with entrepreneurial passion may explain how and why some people with ADHD symptoms

overcome their weaknesses to run successful ventures, while other ADHD entrepreneurs fail to achieve entrepreneurial performance. For example, Sir Richard Branson's (diagnosed with ADHD) passion for creating and growing new ventures is legendary, as is his entrepreneurial performance. In the entrepreneurship context, Wiklund et al. (2016) speculated that ADHD entrepreneurs with a passion for tasks that are central to entrepreneurship perform well.

In this paper, we explore the complex association between ADHD symptoms, entrepreneurial passion, and entrepreneurial performance. We propose that ADHD symptoms in conjunction with passion for certain specific entrepreneurial activities are conducive to success in entrepreneurship, mitigating/reinforcing the effect of ADHD's weaknesses/strengths, respectively, on entrepreneurial performance. Conceptually, our propositions build on a Gestalt perspective (Lewin 1935), embracing causal complexity rather than adopting a perspective of independent, additive, and symmetrical causality (Fiss 2011; Misangyi et al. 2017; Woodside 2013, 2014). Causal complexity comprises conjunction (i.e., the outcome may result from the interdependence of multiple conditions), equifinality (i.e., there may be more than one way to achieve the outcome), and asymmetry (i.e., effective conditions in one configuration may be unrelated or even negatively related to an outcome in another configuration). To empirically examine how ADHD symptoms influence entrepreneurial performance in configurations with entrepreneurial passion, we draw on fuzzy-set qualitative comparative analysis (fsQCA) because it analyzes asymmetrical relationships and identifies alternative causal paths (equifinality) of combinations of conditions (conjunction) that can produce the outcome (Ragin 2008a).

The present work offers several contributions. It enriches the emergent scholarly interest in the link between mental health conditions and entrepreneurship (e.g., Wiklund et al. 2018) by focusing on a common condition that affects millions of adults worldwide (de Graaf et al. 2008) and that may be over-represented among entrepreneurs (Freeman et al. 2019). With the overarching aim of expanding knowledge about the link between ADHD symptoms and entrepreneurship, we add to this research (albeit at the subclinical level, i.e., not manifesting in the level of a diagnosable clinical disorder) by examining the performance outcomes of ADHD symptoms. Prior studies have mainly focused on preferences for and engagement in entrepreneurial activity, implicitly assuming that preferences would

correlate with entrepreneurial performance, which is not necessarily the case. Based on our fsQCA study, we identify alternative causal paths (equifinality) of combinations of neurodevelopmental features in terms of ADHD symptoms and positive emotions (conjunction) that produce the outcome of entrepreneurial performance. This way, we point to both pros and cons of ADHD symptoms in entrepreneurship, providing a balanced view of the implications of the condition. This approach also contributes to a Gestalt perspective of entrepreneurial performance.

Second, our research contributes to the growing literature on entrepreneurial passion, which has conventionally assumed that intense positive feelings for isolated entrepreneurial activities have positive implications in entrepreneurship. However, these approaches are a residual of linear thinking and do not address the complex, configurational nature that may exist between different domains of entrepreneurial passion. Our findings considering entrepreneurs' neurodevelopmental features, however, show that ambidexterity regarding entrepreneurial passion needs to exist for entrepreneurial performance.

Third, this research contributes more generally to building entrepreneurship psychology theory. To a large extent, prior work on entrepreneurial psychology has established that specific psychological characteristics that benefit people in many walks of life are also beneficial in entrepreneurship. Thus, based on such findings, there seems to be little need for domain-specific psychological theory in entrepreneurship. Our findings that ADHD symptoms (deemed universally dysfunctional in psychological theory) in conjunction with specific and, importantly, multiple domains of entrepreneurial passion can be *functional* in entrepreneurship suggest that entrepreneurship is a unique context in need of its unique theories because relationships established elsewhere do not hold up.

## 2 Theoretical background

The person–environment fit theory (Kristof-Brown et al. 2005) and broaden-and-build theory (Fredrickson 2001) are key foundations of this research. The person–environment (P-E) fit theory centers around the compatibility between a person and his or her environment. According to the theory, individuals are attracted to, flourish, and perform well in work environments that match their personal characteristics (e.g., Edwards et al.

2006). The work environment can be analyzed at different levels of specificity including the occupation such as entrepreneurship, the organization, or the job (Kristof-Brown et al. 2005). As regards entrepreneurship as the work environment, Markman and Baron (2003, p. 286) argue that some people are “better suited to exploit commercial opportunities or create new companies than others.” Indeed, there is strong empirical evidence indicating that entrepreneurs running successful ventures differ from unsuccessful entrepreneurs on a range of personality traits including openness or emotional stability (for a meta-analytical overview, see Rauch and Frese 2007; Zhao et al. 2010). This is because these distinctive personality traits affect the likelihood to which entrepreneurs engage in effective behaviors associated with the entrepreneurial role (Zhao et al. 2010). Thus, the higher the entrepreneurs score on these distinctive personality traits, the better is their fit with entrepreneurship (Markman and Baron 2003; Zhao et al. 2010). The P-E fit has been conceptualized and analyzed in terms of attitudes, behavior, and outcomes. In research on ADHD in entrepreneurship, P-E fit has received growing attention, focusing on attitudes such as intentions and preferences (e.g., Verheul et al. 2015), and behaviors such as the likelihood of engaging in start-up activities (e.g., Lerner et al. 2019; Wiklund et al. 2017). However, the last aspect, i.e., firm-level outcomes, has received less attention. This research, therefore, explores how ADHD symptoms relate to entrepreneurial performance as an essential outcome of entrepreneurship, thus scrutinizing the fit between ADHD symptoms, as a stable personal characteristic, and entrepreneurship, as the work environment.

The broaden-and-build theory suggests that positive emotions broaden individuals' momentary thought–action repertoires, which in turn allows building their capabilities and personal resources, ranging from physical and intellectual resources to social and psychological resources (Fredrickson 2001). These enhanced resources of entrepreneurs that occur from positive emotions such as passion are related to entrepreneurial performance (Drnovsek et al. 2016; Wiklund and Shepherd 2003). In this study, we focus on passion for inventing, passion for founding, and passion for developing (Cardon et al. 2009).

Based on a Gestalt perspective, we bring together the above theoretical assumptions to explore the interplay between ADHD symptoms and the different domains of passion for achieving entrepreneurial performance. A

Gestalt perspective builds on a holistic synthesis as the dominant inquiry mode (Magnusson and Torestad 1993). It understands a Gestalt as a system of interconnected elements (Lewin 1935; also called conditions) that tend to form a configuration because their interdependence makes them fall into patterns. Consequently, a Gestalt can embrace multiple domains and is a constellation of conditions that commonly occur together and that are connected within a unifying theme (Wertheimer 1924/1938). The main argument here is that one can only understand the outcomes, including contributions of a person to the outcome against the background of the *field*, which includes the environment of a person as well as their cognitive and emotional reality (Lewin 1935). Thus, a Gestalt perspective embracing causal complexity suits our aim to explain how entrepreneurial performance emerges from the interplay of multiple conditions (conjunction), that is ADHD (at symptomatic and nonsymptomatic levels) and passion for different entrepreneurial activities, accounting for reciprocal and nonlinear relationships between conditions (asymmetry) as well as alternative routes to the outcome (equifinality). To empirically analyze complex causality, we use fsQCA, which is particularly well-suited for the examination of asymmetrical relationships and identification of alternative causal paths of combinations of conditions that can produce the outcome (Ragin 2008a).

## 2.1 ADHD symptoms and entrepreneurial performance

We link ADHD symptoms to entrepreneurial performance by way of personality traits. Considerable empirical evidence based on a P-E fit perspective in entrepreneurship has shown that entrepreneurs' personality traits influence entrepreneurial performance (for an overview, see Zhao et al. 2010). Certain personality traits are more conducive to the entrepreneurial tasks and thereby influence venture performance (e.g., Miner et al. 1994; Miner 1997).

ADHD symptoms persist through life and represent stable individual differences (Larsson et al. 2004) that manifest in several personality traits (Wiklund et al. 2017). Specifically, ADHD symptoms have been positively correlated with trait urgency, lack of perseverance, sensation seeking, and lack of premeditation among entrepreneurs (Wiklund et al. 2017).

To succeed with their venture, entrepreneurs need to focus attention despite being in an environment that is often chaotic (Schindehutte et al. 2006). Entrepreneurs

who can focus their attention are less likely to be perturbed by environmental ambiguity and are more prone to engage in innovation with clarity (Cardon et al. 2009; Zhao et al. 2010). This seems to run counter to urgency as a characteristic of individuals with ADHD symptoms. People with ADHD symptoms often exhibit emotional "hyper-responsiveness" (Barkley 1997) or emotional instability (Settles et al. 2012) that makes them highly sensitive to ambiguous cues, leading to an inability to sustain focused attention necessary for market growth activities.

Second, entrepreneurial performance requires the sustaining of goal-directed action and energy even when faced with difficulties (Baum and Locke 2004). Especially in the case of young ventures, entrepreneurs face considerable difficulties including a lack of legitimacy, which may turn away customers and employees hampering entrepreneurial performance. Difficulty persevering when tasks become difficult is another defining characteristic of ADHD (American Psychiatric Association 2013). Therefore, those with ADHD symptoms are less likely to overcome resource shortages and setbacks—simply because they are less able to mobilize action and the energy needed to assemble social, human, and financial capital critical to entrepreneurial performance (Cardon et al. 2009; Zhao et al. 2010).

Third, entrepreneurial performance depends on the entrepreneur's openness to new situations and their curiosity (Zhao et al. 2010), which seems to align with sensation seeking that is characteristic of people with ADHD symptoms. People high on sensation seeking are inherently curious (Jackson 2011). They tend to approach new situations more positively (Nicolaou et al. 2008), even more so when the environment is highly exploratory containing novel stimuli as it is the case for entrepreneurship (Wiklund et al. 2017).

Fourth, entrepreneurial performance requires proactive engagement in both uncertain opportunity exploitation as well as new opportunity development. Entrepreneurs who do not premeditate are less likely to feel fear and worry (Whiteside and Lynam 2001) when facing an uncertain opportunity because they tend to overlook the negative consequences (Wiklund et al. 2017). Because of their focus on the upside potential rather than the downside risk, entrepreneurs with ADHD symptoms are also more likely to proactively engage in risky projects that have uncertain outcomes or high profits and losses and are thereby critical to entrepreneurial performance (Wismans et al. 2020).

In sum, it seems that the personality aspects through which ADHD symptoms relate to entrepreneurial performance are likely both positive and negative. Thus, it appears that ADHD symptoms alone are insufficient for running successful ventures.

*P1: Isolated ADHD symptoms are insufficient for entrepreneurial performance.*

## 2.2 Entrepreneurial passion and entrepreneurial performance

Entrepreneurial passion describes consciously accessible, intense positive feelings for activities that are central and meaningful to an entrepreneur (Cardon et al. 2009). In principle, entrepreneurs can be passionate for the following three activities (Cardon et al. 2009): Passion for developing relates to growing and expanding the venture, involving intense positive feelings for increasing sales, hiring new employees, or finding external investors. Passion for founding concerns activities related to the assembly of necessary financial, human, and social resources for creating and sustaining a new venture. Passion for inventing is associated with the development of new products and services, scanning of the environment for new market opportunities, and working with new prototypes.

When entrepreneurs are passionate about an entrepreneurial activity, they cannot help but to think about and engage in that activity (Chen et al. 2009), which should affect relevant outcomes such as entrepreneurial performance. Applying the broaden-and-build theory (Fredrickson 2001) to the entrepreneurial context, this is because passion expands thought–action repertoires by activating (via attentional processes) and broadening (via information processing) the scope of cognition, increasing the entrepreneurs' capabilities and resources that guide behavior and thereby effectiveness. For example, passion for developing stimulates absorption (Cardon et al. 2013), i.e., the ability to focus, which has a positive relationship with entrepreneurial performance (Schindehutte et al. 2006; Drnovsek et al. 2016). Similarly, when passion for founding is high, perseverance is salient (Cardon et al. 2013) because the entrepreneur wants to maintain the positive feelings that result from continued engagement in founding activities and resists premature disengagement (Cardon et al.

2009). Furthermore, creativity is pronounced among entrepreneurs, who are passionate for inventing activities (Cardon et al. 2013). This is because their positive feelings allow them to recognize novel patterns of information, perceptually process environmental stimuli, and combine them with their existing knowledge to come up with creative solutions (Cardon et al. 2009).

Success in entrepreneurship and particularly in the young venture stage likely depends on activities that relate to developing, founding, and inventing. If an entrepreneur is passionate about only one of the entrepreneurial activities, there is the risk of the entrepreneur becoming completely immersed in the activity such that they ignore the other activities that are critical to entrepreneurial performance (Cardon et al. 2009). In turn, if intense positive feelings for all three activities are concurrently activated, a performance effect of entrepreneurial passion may also be nonexistent as attentional conflicts will dilute the entrepreneur's effectiveness and, ultimately, entrepreneurial performance.

*P2a: Isolated entrepreneurial passion (i.e., high levels of passion for inventing or passion for founding or passion for developing) is insufficient for entrepreneurial performance.*

*P2b: The combination of high levels of passion for inventing, passion for founding, and passion for developing is insufficient for entrepreneurial performance.*

## 2.3 Adopting a Gestalt perspective: configurations of ADHD symptoms and entrepreneurial passion for entrepreneurial performance

Thus far, we have proposed that isolated ADHD symptoms and entrepreneurial passion are insufficient for entrepreneurial performance. Despite past arguments that neurodevelopmental features such as ADHD symptoms or positive emotions such as entrepreneurial passion are inherent failure or success factors, scholars increasingly recognize that biologically underpinned personality traits and more malleable elements such as passion serve as coherent and interconnected systems that work together to regulate behavior toward outcomes that are important in entrepreneurship (Nicolau and Shane 2014; Nofal et al. 2018). Based on this

recognition, we draw on a Gestalt perspective (Lewin 1935; Wertheimer 1924/1938) to illustrate the interplay between ADHD symptoms and entrepreneurial passion for entrepreneurial performance. For example, Lewin (1952, p. 238) postulated that “the effect of a given stimulus depends on the stimulus constellation and upon the state of the particular person at that time.” Or, as Wertheimer 1924/1938, p. 5) put it when outlining his view on melody, “what is given me by the melody does not arise. . . as a secondary process from the sum of the pieces as such. Instead, what takes place in every single part already depends upon what the whole is.” Consequently, we need to focus on the “whole” which is more than its isolated elements or parts to understand how performance is achieved in entrepreneurship.

Building on this idea, we argue that the performance effect of ADHD symptoms depends on their interdependence with particular entrepreneurial passions, that is passion for developing and passion for founding. Building on the notion that intense positive feelings for venture growth are associated with focused attention (Cardon et al. 2013), we propose that passion for developing counteracts the urgency that characterizes individuals with ADHD symptoms. If the ADHD entrepreneur is passionate for developing activities, he or she is more likely to find the wherewithal to stay focused on developing new sales strategies and finding investors to fund the expansion of the venture. Similarly, as passion for founding is associated with increased perseverance (Cardon et al. 2013), intense positive feelings for founding activities may counteract the difficulty persevering as another defining characteristic of individuals with ADHD symptoms. If the entrepreneur with ADHD symptoms is passionate for founding activities, he or she will be more likely to mobilize action and the energy needed to assemble critical financial, social, and human capital. This is because the intense positive feelings for founding increase continued engagement in the activities that invoke those feelings—simply to maintain the positive emotional state (Pham 2004).

In turn, we argue that passion for inventing is not able to crowd out ADHD-associated weaknesses in terms of entrepreneurial performance, and may additionally limit the neurodevelopmental features’ strengths. Both ADHD and passion for inventing are associated with increased creativity so that this Gestalt bears the risk of overstimulation in combination with the ADHD-associated trait of sensation seeking. Also, it could increase the risk of disengagement from tasks relevant to

other activities that are critical to entrepreneurial performance, which is intensified by the lack of premeditation associated with ADHD symptoms. In this constellation, the ADHD entrepreneur may be so passionate about inventing that they never actually take their products or services to market or hire employees, build networks, and secure funding to exploit the opportunity.

More generally, given the ADHD entrepreneur’s tendency to hyperfocus, i.e., to become extremely immersed in tasks they are passionate about (Schecklmann et al. 2008; Wiklund et al. 2016), we propose that entrepreneurial performance can only be achieved if ADHD symptoms combine with passion for more than one domain, i.e., passion for founding and passion for developing. This Gestalt may limit ADHD-associated weaknesses, i.e., difficulty persevering and sustaining focused attention, while activating ADHD-associated strengths, i.e., openness to new situations and proactivity, thus ensuring a person–environment fit that manifests in entrepreneurial performance. Moreover, the two domains of founding and developing are significantly related (Cardon et al. 2013) and thereby can be harmoniously integrated, ensuring attentional and motivational balance that may positively affect entrepreneurial performance.

*P3: The combination of ADHD symptoms and high levels of passion for developing together with high levels of passion for founding is sufficient for entrepreneurial performance.*

### 3 Methodology

We understand that reality is complex and reflects causal conditions that are asymmetrically related to an outcome (Woodside 2013). Asymmetry implies that the conditions resulting in the presence of the outcome may differ from those resulting in the absence of the outcome (Greckhamer et al. 2008). While the net-effect approach (e.g., regression analysis) assumes that a high value on a predictor relates to a high value of an outcome, the asymmetry principle serves as the foundation of complexity theory in that whether the presence or absence of a condition positively or negatively contributes to the outcome depends on other conditions (Woodside 2014).

To match theory and empirics, we embrace causal complexity (Misangyi et al. 2017) theoretically in terms of a Gestalt perspective and methodologically by using fsQCA—simply because fsQCA allows to analyze asymmetrical relationships, to consider the causal effect of combinations of conditions (conjunction), and to identify alternative causal paths that can produce the outcome (equifinality) (Berg-Schlusser et al. 2009; Greckhamer et al. 2008; Woodside 2013). Specifically, based on Boolean algebra, fsQCA enables the analysis of set relationships, describing asymmetrical relations and thereby situations of complex causality (Ragin 2006). While conventional statistical methods mostly indicate whether and how isolated independent variables influence the level of the outcome, fsQCA produces causal configurations, that is constellations of conditions that occur together to explain the outcome (Meyer et al. 1993; Ragin 2008a). Also, fsQCA addresses the possibility that the outcome can result from different conjunctural causations (Berg-Schlusser et al. 2009). These alternate causal configurations are seen as logically equivalent rather than as competing when explaining the outcome (Ordanini and Maglio 2009).

In particular, we use fsQCA to substantiate our propositions about the (in)-sufficiency of conditions for the outcome. A condition is sufficient “if by itself it can produce a certain outcome” (Ragin 2008b, p. 36). For example, ADHD symptoms would be a sufficient condition for a high degree of entrepreneurial performance, if ADHD symptoms would be present in all high-performing entrepreneurial ventures. Whether or not a condition is sufficient is measured by the fsQCA indicator of consistency. It indicates the extent to which the cases that are characterized by a specific configuration also exhibit the outcome (Fiss 2011).

fsQCA is increasingly applied in management research (e.g., Chang and Cheng 2014; Dwivedi et al. 2018; Fiss 2011; Frazier et al. 2016; Zaefarian et al. 2017) and, particularly, by entrepreneurship scholars (e.g., Del Sarto et al. 2019; Harms et al. 2019; Kraus et al. 2017; Muñoz 2018; Muñoz and Kibler 2016), indicating both the method’s robustness and usefulness for this study’s purpose of also analytically embracing causal complexity.

### 3.1 Data and sample

To examine how ADHD symptoms in conjunction with entrepreneurial passion form configurations that are related to entrepreneurial performance, we rely on a survey among

Dutch entrepreneurs. We selected 2401 entrepreneurial ventures from what is now a Bureau van Dijk database including data from the KvK Dutch Chamber of Commerce database (registration is mandatory for all ventures in The Netherlands). The selection criteria included ventures that were in business for 10 years or less, thus using the cutoff suggested by Jin et al. (2017), and employed at least one employee. The entrepreneurs were initially contacted by phone and were invited to fill out the survey by phone or online (response rate 6.8%). No incentives were given. Our final sample consists of 164 entrepreneurs being, on average, 40 years old (SD 13.02) (81% males). These characteristics are comparable to the population of Dutch entrepreneurs (Bernoster et al. 2018; CBS 2019; Verheul and Thurik 2001). The ventures in our sample are, on average, 6 years old (SD 2.37) and have 11.80 employees (SD 22.72).

### 3.2 Measures

#### 3.2.1 Entrepreneurial performance

Entrepreneurial performance was assessed using the 10-item scale developed by Wiklund and Shepherd (2003), including subjective ratings of growth of sales, revenue, and number of employees, as well as net profit margin, product/service innovation, process innovation, adoption of new technology, quality, variety of product and service, and customer satisfaction compared to main competitors on a 5-point scale. The Cronbach’s alpha for entrepreneurial performance was 0.71.

#### 3.2.2 ADHD symptoms

ADHD symptoms were measured using the established Adult ADHD Self-Report Scale (ASRS-6). The ASRS-6 consists of six of the original 18 DSM-IV “Criterion A” symptoms of ADHD measured on 5-point scales and has proven effective in screening for ADHD (Kessler et al. 2007). These six items included four inattentive symptoms and two hyperactive symptoms. Reliability, as indicated by Cronbach’s alpha, was 0.69, which is higher than the lower bound of 0.63, as reported in Kessler et al.’s (2007) validation of the six-item screener.

Based on the criteria developed by Kessler et al. (2007), which are widely adopted in practice, we recoded the three inattentive items as 1 if respondents had a self-reported value equal or greater than three (i.e., answering “sometimes”, “often”, or “very often”), and

recoded them as 0 otherwise. The fourth inattentive item and the two hyperactivity items were recoded as 1 when respondents' values were equal or greater than 4 (i.e., answering "often" or "very often") and as 0 otherwise. These recoded items were summed up, with a score adding up to 4 or more suggesting a high probability that the person would be diagnosed with ADHD. In our sample, 20.7% ( $n = 34$ ) out of 164 respondents may be diagnosed with ADHD. This is comparable to a general ADHD entrepreneur prevalence rate of 29% (Freeman et al. 2019).

### 3.2.3 Entrepreneurial passion

To assess entrepreneurial passion, we used the three validated entrepreneurial passion scales by Cardon et al. (2013) measured on 5-point scales, assessing passion in one of three domains: (1) inventing (opportunity recognition; 5 items), (2) founding (venture creation; 4 items), and (3) developing (venture growth; 4 items). Each scale incorporates two dimensions: (1) positive, intense feelings for activities associated with the role, and (2) the identity centrality of the role, with the feelings items being averaged and multiplied by the identity item. The alphas for the feelings' components were 0.75 for inventing, 0.72 for founding, and 0.77 for developing.

### 3.2.4 Construct validity and common method bias

We used confirmatory factor analysis (CFA) to evaluate different aspects of validity and reliability (see Appendix 1). Results indicate that the fitness, construct validity, and reliability of our five-factor model with ADHD symptoms and entrepreneurial performance as higher-order constructs and the three passion domains of inventing, founding, and developing being treated as separate conditions are satisfactory.

In addition to procedural remedies addressing common method bias (CMB) (Podsakoff et al. 2003), we tested for possible CMB using the comprehensive CFA marker technique of Williams et al. (2010). The results support the notion that CMB is unlikely to affect the validity of our measures (see Appendix 1).

Descriptive statistics indicate that the three domains of entrepreneurial passion co-vary to a moderate extent (see Table 1), which suggests that the scales capture different foci of entrepreneurial passion as implied by Cardon et al. (2013). None of the three passion domains are—per correlation analysis—associated with

entrepreneurial performance. ADHD symptoms are, based on the correlation logic, negatively related to performance.

### 3.3 Calibration

fsQCA is a set-theoretic approach that evaluates cases according to their set-membership, thus requiring calibration. To transform the raw data measured on interval scales into fuzzy-set scores ranging from 0 to 1, we used direct calibration (Ragin 2008b). Direct calibration is based on the log odds of full membership (Ragin 2008b). We specified the three thresholds or qualitative anchors as follows: full inclusion (fuzzy score = 0.95), full exclusion (fuzzy score = 0.05), and a crossover point (fuzzy score = 0.50) (Ragin 2008a). Full inclusion or full exclusion denotes a case that fully meets or does not meet at all, respectively, the characteristics of the set and thereby conditions. In turn, the crossover point represents the maximum ambiguity to which a case is neither in nor out of the set (Ragin 2009).

To set the thresholds for full inclusion, exclusion, and crossover, we used the empirical distributions (i.e., maximum, the minimum, and the mean) of the raw scores for entrepreneurial performance and entrepreneurial passion (Muñoz and Kimmitt 2019). The extreme values can be considered full-in/full-out of the set, and the mean value can be understood as the value of maximum ambiguity. The calibration procedure for ADHD symptoms was based on the clinical suggestion of Kessler et al. (2007) that individuals would be diagnosed with ADHD if their diagnosis score added up to 4 or higher. Thus, we set a value closest to 4 (i.e., 3.9) as crossover point (membership = 50%). If we had set a value of 4 as the crossover point for ADHD symptoms, a case scoring exactly 4 on the diagnosis score would be at the most ambiguous position, making it analytically impossible to evaluate whether the case exhibits ADHD symptoms or not. Accordingly, 3.9 rather than 4 represents the crossover point, whereas the maximum value (i.e., 6) and minimum value (i.e., 0) indicate full inclusion and full exclusion, respectively. The calibration thresholds are shown in Table 2. Table 1 also displays the descriptive statistics and correlation matrix for the fuzzy scores.



**Table 1** Descriptive statistics and correlations

Factors	Min	Max	Mean	SD	1.	2.	3.	4.	5.
1. ADHD ASRS-6	1.00	4.67	2.64	0.63					
2. ADHD symptoms	0.00	6.00	2.16	1.62	0.90**				
3. Passion for inventing	4.00	25.00	16.96	5.63	0.12	0.13			
4. Passion for founding	2.33	25.00	16.93	6.12	0.00	0.06	0.40**		
5. Passion for developing	1.33	25.00	14.37	6.52	0.12	0.10	0.53**	0.56**	
6. Entrepreneurial performance	2.40	5.00	3.65	0.46	-0.31**	-0.29**	-0.02	0.10	0.00
Fuzzy scores					7.	8.	9.	10.	
7. ADHD symptoms	0.05	0.95	0.31	0.26					
8. Passion for inventing	0.05	0.95	0.54	0.30	0.06				
9. Passion for founding	0.05	0.95	0.56	0.30	0.05	0.41**			
10. Passion for developing	0.05	0.95	0.51	0.30	0.07	0.51**	0.58**		
11. Entrepreneurial performance	0.05	0.95	0.49	0.22	-0.25**	-0.01	0.12	0.02	

\*\*  $p < 0.01$

### 3.4 fsQCA

fsQCA consists of several steps (Ragin 2008b); the first step involves constructing a truth table, which lists the logically possible combinations of causal conditions (configurations) and the cases associated with those configurations, based on calibrated fuzzy scores (Ragin 2008a). Our four conditions result in 16 ( $= 2^4$ ) possible configurations (see the rows in Table 3). While we could assign 156 cases to specific configurations in the truth table, eight cases (including two cases with ADHD symptoms) had to be dropped from the subsequent analysis because they were at the maximum ambiguity.

The next step involves establishing two thresholds to retain the most relevant configurations, that is, the frequency threshold (i.e., the minimum amount of cases to define the relevant configurations) and the consistency

threshold (i.e., the acceptable level of raw consistency to define the configurations supporting the outcome) (Ragin 2009). A frequency threshold of 1 is recommended when using a small- and medium-sized sample (Ragin 2008a). However, as our 16 configurations consist of 2 to 37 cases (see Table 3), we applied a frequency threshold of 2. This value is above the recommended threshold and allows us to retain all 16 configurations. Consistency assesses the extent to which the cases that belong to a specific configuration support the presence of the outcome (Fiss 2011). Thus, high consistency ensures the empirical relevance of the configurations. Ragin (2008a, b) indicates that the choice of the threshold can correspond to gaps observed in the distribution of consistency scores, and experimenting with different thresholds while assessing the consequences is most beneficial. Table 3 suggests several gaps in the

**Table 2** Calibration thresholds

	Fuzzy membership		
	Exclusion (5%)	Crossover (50%)	Inclusion (95%)
Conditions			
ADHD symptoms	0.00	3.90	6.00
Passion for inventing	4.00	16.96	25.00
Passion for founding	2.33	16.94	25.00
Passion for developing	1.33	14.37	25.00
Outcome			
Entrepreneurial performance	2.40	3.65	5.00

**Table 3** Truth table

ADHD symptoms	Passion for inventing	Passion for founding	Passion for developing	Number of cases	Exhibition of the outcome	Raw consistency	Proportional reduction in inconsistency (PRI)
High	Low	High	High	2	Yes	0.916	0.385
Low	High	High	Low	7	Yes	0.914	0.539
High	Low	High	Low	5	No	0.908	0.369
High	High	Low	Low	3	No	0.907	0.306
Low	Low	Low	High	6	No	0.907	0.441
High	High	High	Low	2	No	0.906	0.313
Low	Low	High	Low	8	No	0.905	0.482
Low	Low	High	High	13	No	0.905	0.587
High	Low	Low	High	5	No	0.904	0.271
Low	High	Low	Low	11	No	0.891	0.491
High	Low	Low	Low	4	No	0.885	0.285
Low	High	Low	High	7	No	0.885	0.385
High	High	Low	High	3	No	0.883	0.283
High	High	High	High	8	No	0.856	0.316
Low	High	High	High	35	No	0.806	0.464
Low	Low	Low	Low	37	No	0.780	0.338

distribution of consistency scores. We raised the consistency threshold gradually until we reached the acceptable solution consistency and unique coverage values by assessing the consequences. The final consistency threshold was set to 0.91.

The third step consists in producing solutions based on the edited truth table (Ragin 2008b). To consider the configurations with no or few cases (remainders), fsQCA differentiates between easy and difficult counterfactuals (Fiss 2011). While easy counterfactuals assume that a known configuration would still display the outcome when adding a redundant causal condition to that configuration, difficult counterfactuals assume that removing a redundant causal condition from a configuration known to produce the outcome would still produce the outcome (Fiss 2011; Ragin 2008a). By considering the different types of counterfactuals, fsQCA produces the complex (no counterfactuals are included), intermediate (only easy counterfactuals are considered), and parsimonious solutions (counterfactuals that can help simplify assumptions are considered regardless of their types). The intermediate solution is superior to other solutions because it restricts remainders to those that are the most plausible (Fiss 2011; Ragin 2009). However, these different types of solutions displayed the same result in our analysis in that none of the

remainders were excluded from the minimization process, and thus, none of the counterfactuals needed to be considered.

## 4 Results

### 4.1 Main results

Table 4 indicates that two sufficient configurations are associated with high entrepreneurial performance. We

**Table 4** Causal configurations for entrepreneurial performance

Conditions	S1	S2
ADHD symptoms	●	○
Passion for inventing	○	●
Passion for founding	●	●
Passion for developing	●	○
Raw coverage	0.28	0.40
Unique coverage	0.05	0.18
Consistency	0.92	0.91
Solution coverage	0.46	
Solution consistency	0.89	

The ● symbol represents the presence of the condition, whereas the ○ symbol represents the absence of the condition

rely on two parameters to assess the fit of our configurations: consistency and coverage. Consistency, similar to significance, measures how much of the empirical evidence supports the existence of a relationship between the configurations and the outcome of entrepreneurial performance (Fiss 2011; Ragin 2008a). As the values of consistency for the separate configurations (0.92 and 0.91) and the overall solution (0.89) exceed the cutoff value suggested by Ragin (2006) (0.80), the two configurations can be considered as sufficient for the outcome.

Coverage, similar to  $R^2$ , measures the empirical relevance of the configurations and overall solution, thus indicating the extent to which configurations or a solution explains the outcome (Fiss 2011). While raw coverage refers to the size of the overlap between the size of the causal combination set and the outcome set relative to the size of the outcome set, unique coverage controls for overlapping explanations by partitioning the raw coverage (Ragin 2006, 2008a). Our configurations (raw coverage = 0.28 and 0.40) and overall solution (solution coverage = 0.46) are in the recommended range between 0.25 and 0.65 (Ragin 2008a; Woodside 2013), which indicates their empirical relevance. Moreover, the configurations' unique coverage (0.05 and 0.18) is greater than zero (Ragin 2008b), implying that they both uniquely contribute to the explanation of entrepreneurial performance.

Our two configurations (see Table 4) represent the causal conditions that are sufficient for entrepreneurial performance for entrepreneurs with ADHD symptoms (S1) and without ADHD symptoms (S2).

According to configuration S1, entrepreneurs with ADHD symptoms who are highly passionate about developing and founding, while not having intense positive feelings for inventing, achieve entrepreneurial performance. This configuration strengthens proposition 1 (P1) in that ADHD symptoms by themselves are not sufficient for entrepreneurial performance. Also, the findings reveal that not only combinations of passion for developing and passion for founding are sufficient for the entrepreneurial performance of ADHD entrepreneurs (P3), but that for this outcome also low levels of passion for inventing need to exist. As such, our empirical findings strengthen the theoretical arguments developed in this study; this Gestalt counteracts ADHD-associated weaknesses through passions' focused attention and perseverance, while preventing potential overstimulation associated with high levels of passion for inventing, and thereby fully activates

ADHD-associated strengths for P-E fit manifesting in entrepreneurial performance.

According to configuration S2, entrepreneurs without ADHD symptoms can achieve entrepreneurial performance when they are highly passionate for inventing and founding activities, while not having intense positive feelings for developing activities. In other words, their passion-related creativity and persistence stimulate effectiveness in opportunity recognition and exploitation only if the non-ADHD entrepreneurs are not passionate for growing their venture. This finding suggests that for entrepreneurs without ADHD symptoms—as opposed to entrepreneurs with ADHD symptoms—the enhanced focused attention associated with passion for developing is likely to turn into hyperfocus, preventing them from effectively identifying, inventing, and exploring new opportunities or market niches, as well as from continuously motivating key people, organizing and obtaining resources.

Finally, our empirical findings also resonate with the idea that isolated entrepreneurial passion (P2a) and the simultaneous activation of all three domains of entrepreneurial passion (P2b) are insufficient for entrepreneurial performance: Both entrepreneurs with ADHD symptoms and entrepreneurs without ADHD symptoms need to be highly and thereby ambidextrously passionate about two entrepreneurial activities, whereas the third domain has to be low (i.e., passion for inventing in case of ADHD symptoms and passion for developing in case of no ADHD symptoms).

#### 4.2 Predictive validity and robustness test

This study tests for predictive validity, examining how well the configuration predicts the outcome across different samples (Woodside 2014). Following the procedure of Khedhaouria and Cucchi (2019) and Pappas et al. (2016), we randomly split the sample into two subsamples with an equal number of cases. In the next step, we ran the fsQCA for the first subsample and identified two complex configurations, C1 and C2, with acceptable coverage and consistency indices (see Table 5). C1 and C2 are congruent with S1 and S2 in Table 4. Finally, we tested the obtained findings against the second subsample. The findings point to the configurations' high consistency (C1 0.96; C2 0.94) and coverage (C1 0.23; C2 0.40), suggesting highly consistent models across subsamples and thereby predictive validity of our configurations explaining entrepreneurial performance.

**Table 5** Complex configurations for entrepreneurial performance—subsample 1

Configurations	Raw coverage	Unique coverage	Consistency
C1: ADHD*~inventing*founding*developing	0.29	0.06	0.91
C2: ~ADHD*inventing*founding*~developing	0.42	0.19	0.90
Solution coverage	0.48		
Solution consistency	0.89		

~ indicates the absence of the condition, whereas \* denotes logical “AND” operation in the fuzzy-set algorithms

We employ a confirmatory necessity test and two sensitivity tests (see Appendix 2) to check the stability and robustness of our main findings (Dwivedi et al. 2018; Muñoz and Kimmitt 2019). The confirmatory necessity test indicates that no single condition taken by itself is capable of producing the outcome, thus supporting causal complexity for entrepreneurs with ADHD symptoms when achieving entrepreneurial performance. To further check the solutions’ robustness, we used alternative specifications for editing the truth tables and calibrations. These sensitivity analyses corroborate the robustness of the main solutions and strengthen our propositions (see Appendix 2).

## 5 Discussion

This study was motivated by recent theorizing and empirical evidence that ADHD-type entrepreneurs have particular strengths that are positively related to entrepreneurial intention and start-up activity. While immensely valuable, this past research has not strongly focused on entrepreneurial outcomes and deflected scholarly attention away from considering the trait-associated weaknesses of ADHD symptoms, which may ultimately reduce entrepreneurial performance. Indeed, it is not yet well understood whether and why some entrepreneurs with ADHD symptoms fail to perform well, while other ADHD entrepreneurs overcome their weaknesses to run successful ventures (Wiklund et al. 2016). This has led some scholars to suggest that to develop actionable entrepreneurship psychology theory, researchers must focus on outcomes that are important to practicing entrepreneurs and refrain from taking an isolated approach to ADHD symptoms; instead, we need to focus on factors that shape variability within ADHD-type entrepreneurs and thereby mitigate/reinforce the effect of ADHD’s weaknesses/strengths,

respectively, on entrepreneurial performance (e.g., Antshel 2018).

To this end, we built on a Gestalt perspective of entrepreneurial performance and integrated research on P-E fit and broaden-and-build theory to investigate how entrepreneurs’ ADHD symptoms (at the subclinical level) combined with passion for key entrepreneurial activities jointly determine entrepreneurial performance. Our exploratory qualitative comparative study uncovered different combinations of conditions sufficient for the entrepreneurial performance of entrepreneurs with and without ADHD symptoms in running successful ventures. In essence, our findings show that neither ADHD symptoms alone (proposition 1) nor passion for a single or all three entrepreneurial domains (propositions 2a and b) is a condition for entrepreneurial performance. Instead, ADHD symptoms and entrepreneurial passion ambidexterity act as complements for entrepreneurial performance (proposition 3). Our findings further indicate that the performance configuration ADHD entrepreneurs differs from the Gestalt of non-ADHD entrepreneurs’ entrepreneurial performance. Per our configurational focus, we first discuss and interpret our findings by performance recipes, rather than by individual factor.

First, our results contribute to the debate on whether or not ADHD symptoms can be beneficial to entrepreneurial performance and thereby outcomes in entrepreneurship (e.g., Antshel 2018; Lerner et al. 2019)—they evidently can be beneficial—but also suggest that a lack of entrepreneurial passion and domain-related overactivation are detrimental to the achievement of entrepreneurial performance among ADHD-type entrepreneurs. This points to the fundamental role played by the alignment of task-related emotions in the entrepreneurial effectiveness of ADHD symptoms. Successful ADHD-type entrepreneurs are those that combine passion for developing and founding but lack passion for inventing. This echoes the idea that the ADHD-specific difficulty sustaining focused attention (urgency) is mitigated by the sustained focus that is induced

by passion for developing, and that the ADHD-specific difficulty persevering is balanced out by perseverance that is induced by passion for founding (Cardon et al. 2009, 2013). As ADHD-type entrepreneurs already seek sensations, thus enhancing creativity (Wiklund et al. 2017), this would be amplified by the creativity that is induced by passion for inventing (Cardon et al. 2009, 2013) and may lead to dysfunctional obsessive passion (Ho and Pollack 2014). By moving beyond isolated neurodevelopmental and emotional features, our study, therefore, helps to clarify prior research findings regarding the uniformly good or bad role of individual success factors in entrepreneurship, thus contributing to a more holistic understanding of entrepreneurial performance. ADHD symptoms and entrepreneurial passion are substantial gray or “fuzzy” areas that are contingent on each other.

In that sense, our findings also indicate that the affective mechanisms that have allowed people with ADHD symptoms to own and run successful ventures are not the same for non-ADHD entrepreneurs. Successful non-ADHD entrepreneurs are those that combine a passion for inventing with a passion for founding but lack a passion for developing. As for entrepreneurs with ADHD symptoms, entrepreneurs without ADHD symptoms need to be passionate about founding, as it enables them to mobilize the action and energy needed to assemble critical financial, social, and human capital. However, as entrepreneurs without ADHD symptoms lack not only ADHD-specific weaknesses but also strengths, they need to nourish their passion for inventing to make up for their potentially inherent difficulties in recognizing novel patterns of information and combine them with existing knowledge to develop creative solutions. Interestingly, and opposed to prior research that advanced our understanding of how isolated passion for developing influences venture growth (Drnovsek et al. 2016), our findings suggest a dysfunctionality of passion for developing for non-ADHD entrepreneurs. We theorize that this occurs because business development is highly challenging, especially in young venture contexts where uncontested success is unlikely and where performance goals are continuously set to higher levels (Cardon et al. 2009). While this may be exciting for an entrepreneur fired by passion for developing, the associated enhanced focus may lead to hyperfocus among non-ADHD entrepreneurs, consuming considerable cognitive resources and limiting resources available for engaging in founding and inventing activities. In line with this theorizing, a growing body of research suggests that when a strength is overused, there is a risk of reduced

capacity on the opposite pole, with such overlap turning strengths into weaknesses (Kaplan and Kaiser 2009). Beyond contributing specifically to the literature on ADHD symptoms in entrepreneurship, we believe our study contributes, more broadly, to the growing stream of work pursuing deeper insight into the potentially detrimental influences of psychological variables that have generally been viewed as positive in entrepreneurship (Wiklund et al. 2018).

A second important contribution of our work is that it shows when entrepreneurial passion has dysfunctional outcomes and why, as has been called for by Cardon et al. (2009). Our findings imply that entrepreneurs fired by passion for a single entrepreneurial domain become resistant to engaging in other activities critical to entrepreneurial performance, potentially fearing that doing so may dilute and distract the intense positive experience. Consistent with this, Vallerand et al. (2003) suggested that extremely intense passion, as it likely occurs when experiencing intense positive feelings for only one entrepreneurial activity, may invoke an obsessive response indicated by a rigid rather than flexible manner of engagement in activities that are central and meaningful to the entrepreneur. Thus, drawing on the distinction between harmonious and obsessive passion (Ho and Pollack 2014), we suggest that passion for only one entrepreneurship domain may bear the risk of producing response patterns that are obsessive or misdirected, especially for entrepreneurs with ADHD symptoms.

In turn, experiencing high levels of passion in all three entrepreneurial domains equally interferes with entrepreneurial performance. On the one hand, this is surprising as prior research has argued that with increasing positive emotions, entrepreneurs are more likely to be effective because of the broaden-and-build effect. On the other hand, drawing on the affect-as-information theory (Clore and Parrott 1991), which postulates that emotions function as information, there is the risk that entrepreneurs having intense positive feelings for all three domains experience information overload and thereby attentional conflicts. In this situation, individuals typically adopt simplified heuristic processing strategies by relying on stereotypical information rather than on analytic strategies (Forgas 1995). While this strategy enables entrepreneurs to make fast decisions that are needed in entrepreneurship, it may explain declined entrepreneurial performance as it increases susceptibility to biases (Baron 2008; Baron et al. 2012). Overall, our findings enrich theorizing on emotions in

entrepreneurship in that passion ambidexterity is essential for entrepreneurial performance.

Our study has moved beyond the linear perspective on how ADHD symptoms and entrepreneurial passion affect entrepreneurship. We show that ADHD–passion configurations exist as conditions for entrepreneurial performance. Consequently, by indicating that “negative” and “excessive” characteristics are associated with entrepreneurial performance, this study, in concert with a growing stream of research (Wiklund et al. 2018), supports the notion of equifinality in entrepreneurial endeavors and plurality in entrepreneurial logics for successful action. In a broader context, we expect the Gestalt perspective to be relevant for research on other mental health conditions and entrepreneurship, such as sensory processing sensitivity (Harms et al. 2019), dyslexia (Logan 2009), bipolar traits (Johnson et al. 2018), and mood disorders (Bogan et al. 2013). Because entrepreneurship happens at the interface between the individual, opportunity, and environment, entrepreneurs with different characteristics will perform well under different conditions. Research that identifies those conditions provides value by unlocking the potential of those entrepreneurs and pushing the boundaries of existing theories.

### 5.1 Limitations and future research

While our research has advanced the literature on the performance implications of ADHD symptoms and entrepreneurial passion, future research may address the shortcomings of this research and address new questions that have emerged. First, our cross-sectional inquiry, and configurational approach more generally, do not allow for claims of causality, nor do they help rule out any potential reverse causality among the relationships. As the current set-theoretic methodology is not yet equipped to resolve these issues of causality and endogeneity, future configurational research that addresses this issue, using longitudinal designs (Misangyi and Acharya 2014), is needed. Here, future research could analyze the relative importance of particular ADHD–passion configurations at different stages of the entrepreneurial process, i.e., pre-start-up, start-up, early growth, rapid growth, and stabilization. For example, passion for founding may be even more critical during the start-up stage. In turn, passion for developing may become part of the performance recipe of non-ADHD entrepreneurs at later stages of venture development, where first adaptations of the business model may

become necessary. Thus, future research that probes more deeply into particular performance recipes along the entrepreneurial process is warranted.

Second, we need to consider a more extensive variety of performance indicators. The Wiklund and Shepherd (2003) scale is useful because it covers several domains of entrepreneurial performance, and has been validated in previous research (see, e.g., Irwin et al. 2018; Naldi et al. 2007; Wiklund et al. 2017; Yu et al. 2019). Nevertheless, an essential step in establishing additional evidence for performance recipes among entrepreneurs with ADHD symptoms is exploring configurations for other entrepreneurial outcomes. For example, objective performance indicators, although difficult to obtain and to interpret for new ventures, may nuance our findings. Also, to provide a more holistic picture of entrepreneurial performance (e.g., Hatak and Zhou 2019; Wach et al. 2016), we encourage future research to differentiate specifically between financial performance and nonfinancial performance in the form of entrepreneurs’ subjective well-being.

Third, we posited mechanisms by which ADHD symptoms and passion affect entrepreneurial performance, but did not explicitly examine these mediating mechanisms. Future work may directly test the pathways we suggested. In this regard, an exciting direction for future research may be to explore the dimensionality of ADHD symptoms, i.e., inattention, hyperactivity, and impulsivity, in conjunction with the three domains of entrepreneurial passion.

Another avenue for future research triggered by our study concerns how ADHD-type entrepreneurs can work together with other entrepreneurs in teams. For example, entrepreneurs with limited ability to sustain mental effort may substitute passion for developing with other team members to perform such tasks for them (Lerner et al. 2018; Wiklund et al. 2018). A deeper, likely qualitative investigation into performance-relevant team dynamics between entrepreneurs with and without ADHD symptoms is likely to make an important contribution to the entrepreneurship literature and hopefully also to the literatures on team diversity and management. Also, we look forward to research that applies the Gestalt perspective to other types of mental health conditions.

### 5.2 Implications and conclusions

The findings of this research provide input for entrepreneurial decision-making and choice regarding

appropriate approaches for the specific venture. In particular, the findings of this study suggest a two-step approach. First, the configurational analyses by neurodevelopmental features and task-related emotions help entrepreneurs better understand the differential trait mobilization requirements for achieving entrepreneurial performance. Entrepreneurs need to assess for which entrepreneurial activities they have intense positive feelings so that they can decide whether and how they have to nourish their passion for inventing and founding in case of no ADHD symptoms and their passion for developing and founding in case of ADHD symptoms.

Second, the findings of the configurational analysis of trait mobilization through ADHD symptoms and entrepreneurial passion suggest that different action repertoires for entrepreneurial performance exist, thus providing managerial choice. Specifically, an analysis of the current ADHD–passion portfolio of the owner–manager can provide an impetus for a gap analysis, which helps uncover discrepancies between the status quo and the venture’s target performance. Such information would provide managerial guidance for the delegation of critical tasks to members of the venture team and recruitment.

Finally, the understanding that mental health conditions and ADHD in particular have dark and bright sides in entrepreneurship suggests the opportunity for research to help educators, coaches, and consultants focus on strengths (such as openness to new situations, proactivity) and compensate for weaknesses through nourishing positive feelings for founding and developing activities.

Overall, the present work contributes to theory by linking recent research on ADHD symptoms, entrepreneurial passion, and entrepreneurial performance with fuzzy-set methodology. Consistent with this approach, our findings point to a configurational nature of entrepreneurial performance. As such, our study provides a significantly richer understanding of how and why ADHD symptoms interact with entrepreneurial passion. In conclusion, future researchers and policymakers would do well to take a more configurational approach, in terms of how they think about, design, and study dark constructs in entrepreneurship. To truly understand performance outcomes in entrepreneurship, we must stop thinking about the constructs in isolation, give up the search for the “superhero” or “evil” constructs, and instead direct attention to how the various individual characteristics combine effectively with each other for the particular outcomes desired.

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## Appendix 1: Construct validity and common method bias

Several confirmatory factor analysis (CFA) models were compared to evaluate of validity and reliability (see Table 6). For discriminant validity, results indicated that the one-factor CFA model had the worst fit ( $\chi^2 = 1227.69$ ,  $df = 299$ ), whereas the second-order five-factor model (M8) fitted the data significantly better than the other models ( $\Delta\chi^2 = 115.99$ ,  $\Delta df = 3$ ,  $p < 0.000$ ), which supports discriminant validity. Our five-factor model indicates that ADHD symptoms and entrepreneurial performance are higher-order constructs, and we can treat the three passion domains of inventing, founding, and developing as separate conditions.

Table 7 displays the model’s standardized factor loadings, average variance extracted (AVE), and composite reliability (CR). The CRs of all factors ranged from 0.59 to 0.78, which are close to or meet the acceptable level of 0.60 (Fornell and Larcker 1981), except for the measure of entrepreneurial performance. The lower CR score for entrepreneurial performance follows from its conceptualization and operationalization as a formative construct (Wiklund and Shepherd 2003). Although the AVE scores for passion for inventing and passion for founding were below the recommended level of 0.50, the factors’ acceptable CR scores allow concluding adequate convergent validity, with AVE being a more conservative estimate of the measurement model’s validity (Fornell and Larcker 1981).

CMB was addressed by the fact that the cover story and survey content did not suggest social desirability, positive or negative affectivity, or a particular relation between the variables (Podsakoff et al. 2003). The respondents were ascertained about their anonymity, and the survey emphasized that there are no right or wrong answers and encouraged honest response behavior (Podsakoff et al. 2003, p. 888). To test for possible CMB, we used the comprehensive CFA marker technique of Williams et al. (2010) and compared a series of CFA models. According to Williams et al. (2010), a marker should be theoretically unrelated to the core measures—

**Table 6** Comparison of confirmatory factor analysis (CFA) models

	CFA model	$\chi^2$	<i>df</i>	CFI	SRMR	$\Delta\chi^2$ ( <i>df</i> )	<i>p</i> value
M1	One-factor model	1227.69	299	0.27	0.15		
M2	Two-factor model	907.91	298	0.52	0.11	M2 vs. M1: 319.79 (1)	0.000
M3	Three-factor model	766.60	296	0.63	0.10	M3 vs. M2: 141.31 (2)	0.000
M4	Four-factor model	731.56	293	0.66	0.09	M4 vs. M3: 35.04 (3)	0.000
M5	Second-order three-factor model (1)	748.05	294	0.64	0.10	M4 vs. M5: 16.49 (1)	0.000
M6	Second-order three-factor model (2)	638.03	291	0.73	0.09	M6 vs. M4: 93.53 (2)	0.000
M7	Second-order five-factor model (1)	632.95	288	0.73	0.09	M7 vs. M6: 5.08 (3)	0.166
M8	Second-order five-factor model (2)	516.96	285	0.82	0.08	M8 vs. M7: 115.99 (3)	0.000
M9	Second-order six-factor model	514.30	282	0.82	0.08	M9 vs. M8: 2.66 (3)	0.447

M2: The first factor included the items of ADHD symptoms and entrepreneurial passion, whereas the second factor covered entrepreneurial performance. M3: The three latent factors were ADHD symptoms, entrepreneurial passion, and entrepreneurial performance. M4: ADHD symptoms were split into attention deficit and hyperactivity. M5: ADHD symptoms were the higher-order factor, and the two latent factors were entrepreneurial passion and entrepreneurial performance. M6: ADHD symptoms and entrepreneurial passion were the higher-order factors, with entrepreneurial performance being the latent factor. M7: ADHD symptoms were the higher-order factor, and the four latent factors were the three domains of entrepreneurial passion and entrepreneurial performance. M8: ADHD symptoms and entrepreneurial performance were the higher-order factors, and the three latent factors were three domains of entrepreneurial passion. M9: ADHD symptoms were the higher-order factors, and the five latent factors were three domains of entrepreneurial passion and two dimensions of entrepreneurial performance

*CFI* comparative fit index, *SRMR* standardized root mean square residual

in this study, an established five-item measure of entrepreneurs' social identity, that is the communitarian entrepreneurial identity (Sieger et al. 2016). The presence of a non-zero correlation of the marker with core variables indicates CMB. Our results indicate that the fit of the baseline model (without linking the marker to the core measures) is significantly better than method-C (assuming the marker has equal influence on all measures;  $\Delta\chi^2 = 445.72$ ,  $\Delta df = 93$ ,  $p < 0.000$ ) or method-U models (assuming the marker has an unequal influence on all measures;  $\Delta\chi^2 = 399.35$ ,  $\Delta df = 65$ ,

$p < 0.000$ ). These results support the notion that CMB is unlikely to affect the validity of our measures.

## Appendix 2: Predictive validity and robustness test

As regards the confirmatory necessity test, a condition is necessary when the condition is always present/absent along with the presence/absence of the outcome (Ragin 2008a). In other words, the outcome can be explained

**Table 7** Standardized factor loadings, average variance extracted (AVE), and composite reliability (CR)

Factors	Standardized factor loadings	AVE	CR
ADHD	0.39* to 0.98*	0.56	0.68
Inattention	0.41*** to 0.74***	0.41	0.73
Hyperactivity	0.45*** to 0.82***	0.44	0.59
Passion for inventing	0.51*** to 0.76***	0.44	0.75
Passion for founding	0.55*** to 0.79***	0.48	0.73
Passion for developing	0.61*** to 0.89***	0.54	0.78
Entrepreneurial performance	0.39*** to 0.56***	0.23	0.37
Financial performance	-0.04 to 0.99***	0.49	0.72
Operational performance	0.21* to 0.77***	0.30	0.69



**Table 8** Confirmatory necessity analysis

	The presence of entrepreneurial performance		The absence of entrepreneurial performance	
	Consistency	Coverage	Consistency	Coverage
ADHD symptoms	0.42	0.72	0.47	0.83
~ADHD symptoms	0.90	0.62	0.84	0.60
Passion for inventing	0.75	0.68	0.74	0.69
~Passion for inventing	0.66	0.71	0.66	0.73
Passion for founding	0.77	0.68	0.71	0.66
~Passion for founding	0.61	0.67	0.65	0.74
Passion for developing	0.72	0.69	0.70	0.69
~Passion for developing	0.67	0.68	0.68	0.72

~ indicates the absence of a condition

solely by the necessary condition, i.e., the condition is the superset of the outcome. The consistency scores of all our conditions (see Table 8) are below the threshold value of 0.95 (Ragin 2006) so that none of the conditions is necessary for the outcome. This finding confirms the causal complexity for entrepreneurs with ADHD symptoms when achieving entrepreneurial

performance in that no single condition taken by itself is capable of producing the outcome.

Table 9 presents the sensitivity analyses. In these analyses, we used different thresholds for frequency and consistency and alternative calibrations. The results show that configurations S6, S7, and S8 are the superset of S1, and configurations S3, S4, and S5 are the superset of S2. Also,

**Table 9** Sensitivity tests

Conditions	Sensitivity test 1 <sup>a</sup>		Sensitivity test 2 <sup>b</sup>			Sensitivity test 3 <sup>c</sup>	
	S3	S4	S5	S6	S7	S8	S9
ADHD		○	○	●			○
Passion for inventing	●		●		○	○	●
Passion for founding	●	●		●	●	●	●
Passion for developing	○	○	○	●	●	●	○
Raw coverage	0.43	0.45	0.44	0.26	0.3	0.36	0.33
Unique coverage	0.02	0.07	0.17	0.03	0.06	0.16	0.09
Consistency	0.88	0.87	0.98	0.99	0.99	0.84	0.86
Solution coverage	0.62		0.55			0.45	
Solution consistency	0.82		0.98			0.82	

The ● symbol represents the presence of the condition, whereas the ○ symbol represents the absence of the condition. The blank cell denotes the “do not care” condition

<sup>a</sup> The first sensitivity test was conducted using the frequency threshold of 5 and consistency threshold of 0.90

<sup>b</sup> The second sensitivity test was conducted with the alternative calibration procedure, in which the specification of the three anchors was based on the definition of the scale (Fiss 2011). Specifically, 5, 3, and 1 were used as the thresholds for full inclusion, crossover, and full exclusion in terms of entrepreneurial performance. The three domains of passion used 25, 13, and 1 as thresholds. ADHD symptoms were calibrated following the suggestion of Kessler et al. (2007). The truth table in this sensitivity analysis was edited using the frequency threshold of 3 and the consistency threshold of 0.99

<sup>c</sup> The third sensitivity test was conducted with the alternative calibration procedure, in which the specification of the three anchors was based on the 5th, 50th, and 95th percentiles of conditions, except for ADHD symptoms, which were calibrated following the clinical suggestion of Kessler et al. (2007). The truth table in this sensitivity analysis was edited using the frequency threshold of 2 and the consistency threshold of 0.85

S9 is congruent with S2. Thus, the sensitivity analyses corroborate the robustness of the main results.

In addition, our sensitivity analyses can substantially complement S1 and S2. According to S1 (see Section 4.1), entrepreneurs with ADHD symptoms need to be highly passionate for developing and founding activities to ensure effective P-E fit and thereby entrepreneurial performance. Nevertheless, they can additionally rely on passion for inventing as a success factor if they balance out potential overstimulation through nourishing their intense positive feelings for founding and developing (S6). Consequently, our sensitivity analyses strengthen proposition P1 and enrich proposition P3.

Moreover, the performance recipe for entrepreneurs with ADHD symptoms (S1) is relevant for entrepreneurs without ADHD symptoms (S7, S8). Our sensitivity analyses imply that entrepreneurs running successful ventures exhibit ambidexterity in terms of entrepreneurial passion (S3, S7, S8). Thus, in line with proposition P2b, the simultaneous experience of intense positive feelings for all three entrepreneurial domains would lead to attentional conflicts that dilute the effectiveness of both ADHD entrepreneurs and non-ADHD entrepreneurs.

Comparing S2 with S4 and S5 indicates that entrepreneurs without ADHD symptoms can resort to either one domain of entrepreneurial passion or maximally two passion domains in running successful ventures. Entrepreneurs without ADHD symptoms can flexibly transcend between passion for inventing (S5) and passion for founding (S4)—or be passionate for both activities (S2, S9)—to achieve entrepreneurial performance, as long as they are not passionate for market growth activities. Consequently, our sensitivity analyses nuance proposition P2a for non-ADHD entrepreneurs. Entrepreneurs who are passionate for only a single entrepreneurial activity may suffer from hyperfocus—even more so under the condition of passion for developing as it increases focused attention. However, the absence of ADHD symptoms, together with the absence of passion for developing (S4, S5), limits the risk of isolated entrepreneurial passion extremely and thereby unproductively activating entrepreneurs' focus.

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## References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders DSM-5* (5th ed.). Washington, DC: American Psychiatric Association. <https://doi.org/10.1176/appi.books.9780890425596>.
- Antshel, K. M. (2018). Attention deficit/hyperactivity disorder (ADHD) and entrepreneurship. *Academy of Management Perspectives*, 32(2), 243–265. <https://doi.org/10.5465/amp.2016.0144>.
- Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: constructing a unifying theory of ADHD. *Psychological Bulletin*, 121(1), 65–94. <https://doi.org/10.1037/0033-2909.121.1.65>.
- Baron, R. A. (2008). The role of affect in the entrepreneurial process. *Academy of Management Review*, 33, 328–340. <https://doi.org/10.2307/20159400>.
- Baron, R. A., Hmieleski, K. M., & Henry, R. A. (2012). Entrepreneurs' dispositional positive affect: the potential benefits – and potential costs – of being 'up'. *Journal of Business Venturing*, 27, 310–324. <https://doi.org/10.1016/j.jbusvent.2011.04.002>.
- Baum, J. R., & Locke, E. A. (2004). The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology*, 89(4), 587–598. <https://doi.org/10.1037/0021-9010.89.4.587>.
- Berg-Schlosser, D., De Meur, G., Rihous, B., & Ragin, C. C. (2009). Qualitative comparative analysis (QCA) as an approach. In B. Rihoux & C. C. Ragin (Eds.), *Configurational comparative methods: qualitative comparative analysis (QCA) and related techniques (applied social research methods)* (pp. 1–18). Thousand Oaks and London: Sage. <https://doi.org/10.4135/9781452226569.n1>.
- Bernoster, I., Mukerjee, J., & Thurik, R. (2018). The role of affect in entrepreneurial orientation. *Small Business Economics*, 54, 235–256. <https://doi.org/10.1007/s11187-018-0116-3>.
- Bogan, V., Fertig, A., & Just, D. (2013). *Self-employment and mental health*. <https://doi.org/10.2139/ssrn.2259765>.
- Cardon, M. S., Wincent, J., Singh, J., & Drnovsek, M. (2009). The nature and experience of entrepreneurial passion. *Academy of Management Review*, 34(3), 511–532. <https://doi.org/10.5465/AMR.2009.40633190>.
- Cardon, M. S., Gregoire, D. A., Stevens, C. E., & Patel, P. C. (2013). Measuring entrepreneurial passion: conceptual foundations and scale validation. *Journal of Business Venturing*, 28(3), 373–396. <https://doi.org/10.1016/j.jbusvent.2012.03.003>.
- CBS. (2019). Ondernemers; persoonskenmerken, bedrijfsgrootte, bedrijfstak. <https://mkbstatline.cbs.>

- nl/#/MKBNl/dataset/48001NED/table?ts=1573120212974, Accessed 27 Nov 2019.
- Chang, M.-L., & Cheng, C.-F. (2014). How balance theory explains high-tech professionals' solutions of enhancing job satisfaction. *Journal of Business Research*, 67(9), 2008–2018. <https://doi.org/10.1016/j.jbusres.2013.10.010>.
- Chen, X.-P., Yao, X., & Kotha, S. (2009). Entrepreneur passion and preparedness in business plan presentations: a persuasion analysis of venture capitalists' funding decisions. *Academy of Management Journal*, 52, 199–214. <https://doi.org/10.5465/amj.2009.36462018>.
- Clore, G. L., & Parrott, G. (1991). Moods and their vicissitudes: thoughts and feelings as information. In J. P. Forgas (Ed.), *Emotion and social judgments* (pp. 107–123). Oxford: Pergamon.
- de Graaf, R., Kessler, R. C., Fayyad, J., et al. (2008). The prevalence and effects of adult attention deficit/hyperactivity disorder (ADHD) on the performance of workers: results from the WHO World Mental Health Survey Initiative. *Occupational and Environmental Medicine*, 65(12), 835–842. <https://doi.org/10.1136/oem.2007.038448>.
- Del Sarto, N., Di Minin, A., Ferrigno, G., & Piccaluga, A. (2019). Born global and well educated: start-up survival through fuzzy set analysis. *Small Business Economics*. <https://doi.org/10.1007/s11187-019-00238-6>.
- Dmowsek, M., Cardon, M. S., & Patel, P. C. (2016). Direct and indirect effects of passion on growing technology ventures. *Strategic Entrepreneurship Journal*, 10(2), 194–213. <https://doi.org/10.1002/sej.1213>.
- Dwivedi, P., Joshi, A., & Misangyi, V. F. (2018). Gender-inclusive gatekeeping: how (mostly male) predecessors influence the success of female CEOs. *Academy of Management Journal*, 61(2), 379–404. <https://doi.org/10.5465/amj.2015.1238>.
- Edwards, J. R., Cable, D. M., Williamson, I. O., Lambert, L. S., & Shipp, A. J. (2006). The phenomenology of fit: linking the person and environment to the subjective experience of person-environment fit. *Journal of Applied Psychology*, 91(4), 802–827. <https://doi.org/10.1037/0021-9010.91.4.802>.
- Fiss, P. C. (2011). Building better causal theories: a fuzzy set approach to typologies in organization research. *Academy of Management Journal*, 54(2), 393–420. <https://doi.org/10.5465/amj.2011.60263120>.
- Forgas, J. P. (1995). Mood and judgment: the affect infusion model (AIM). *Psychological Bulletin*, 117, 39–66. <https://doi.org/10.1037/0033-2909.117.1.39>.
- Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.2307/3151312>.
- Frazier, M. L., Tupper, C., & Fainshmidt, S. (2016). The path(s) to employee trust in direct supervisor in nascent and established relationships: a fuzzy set analysis. *Journal of Organizational Behavior*, 37(7), 1023–1043. <https://doi.org/10.1002/job.2091>.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: the broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218. <https://doi.org/10.1037/0003-066X.56.3.218>.
- Freeman, M. A., Staudenmaier, P. J., Zisser, M. R., & Andresen, L. A. (2019). The prevalence and co-occurrence of psychiatric conditions among entrepreneurs and their families. *Small Business Economics*, 53(2), 323–342. <https://doi.org/10.1007/s11187-018-0059-8>.
- Greckhamer, T., Misangyi, V. F., Elms, H., & Lacey, R. (2008). Using qualitative comparative analysis in strategic management research. *Organizational Research Methods*, 11(4), 695–726. <https://doi.org/10.1177/1094428107302907>.
- Harms, R., Hatak, I., & Chang, M.-L. (2019). Sensory processing sensitivity and entrepreneurial intention: the strength of a weak trait. *Journal of Business Venturing Insights*, 12, 1–12. <https://doi.org/10.1016/j.jbvi.2019.e00132>.
- Hatak, I., & Zhou, H. (2019). Health as human capital in entrepreneurship: individual, extension, and substitution effects on entrepreneurial success. *Entrepreneurship Theory and Practice*. <https://doi.org/10.1177/1042258719867559>.
- Ho, V. T., & Pollack, J. M. (2014). Passion isn't always a good thing: examining entrepreneurs' network centrality and financial performance with a dualistic model of passion. *Journal of Management Studies*, 51(3), 433–459. <https://doi.org/10.1111/joms.12062>.
- Irwin, K. C., Landay, K. M., Aaron, J. R., McDowell, W. C., Marino, L. D., & Geho, P. R. (2018). Entrepreneurial orientation (EO) and human resources outsourcing (HRO): a “HERO” combination for SME performance. *Journal of Business Research*, 90, 134–140. <https://doi.org/10.1016/j.jbusres.2018.05.016>.
- Jackson, C. J. (2011). How sensation seeking provides a common basis for functional and dysfunctional outcomes. *Journal of Research in Personality*, 45(1), 29–36. <https://doi.org/10.1016/j.jrp.2010.11.005>.
- Jin, L., Madison, K., Kraiczky, N. D., Kellermanns, F. W., Crook, T. R., & Xi, J. (2017). Entrepreneurial team composition characteristics and new venture performance: a meta-analysis. *Entrepreneurship Theory and Practice*, 41(5), 743–771. <https://doi.org/10.1111/etap.12232>.
- Johnson, S. L., Madole, J., & Freeman, M. (2018). Mania risk and entrepreneurship: overlapping personality traits. *Academy of Management Perspectives*, 32(2), 207–227. <https://doi.org/10.5465/amp.2016.0165>.
- Kaplan, R. E., & Kaiser, R. B. (2009). Stop overdoing your strengths. *Harvard Business Review*, 87(2), 100–103.
- Kessler, R. C., Adler, L. A., Gruber, M. J., Sarawate, C. A., Spencer, T., & Van Brunt, D. L. (2007). Validity of the World Health Organization adult AD/HD self-report scale (ASRS) in a representative sample of health plan members. *International Journal of Methods in Psychiatric Research*, 16, 52–65. <https://doi.org/10.1002/mpr.208>.
- Khedhaouria, A., & Cucchi, A. (2019). Technostress creators, personality traits, and job burnout: a fuzzy-set configurational analysis. *Journal of Business Research*, 101, 349–361. <https://doi.org/10.1016/j.jbusres.2019.04.029>.
- Kraus, S., Ribeiro-Soriano, D., & Schüssler, M. (2017). Fuzzy-set qualitative comparative analysis (fsQCA) in entrepreneurship and innovation research – the rise of a method. *International Entrepreneurship and Management Journal*, 14(1), 15–33. <https://doi.org/10.1007/s11365-017-0461-8>.
- Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: a meta-analysis of person-job, person-organization, person-group,

- and person-supervisor fit. *Personnel Psychology*, 58(2), 281–342. <https://doi.org/10.1111/j.1744-6570.2005.00672.x>.
- Larsson, J. O., Larsson, H., & Lichtenstein, P. (2004). Genetic and environmental contributions to stability and change of ADHD symptoms between 8 and 13 years of age: a longitudinal twin study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 43(10), 1267–1275. <https://doi.org/10.1097/01.chi.0000135622.05219.bf>.
- Lerner, D. A., Hunt, R. A., & Verheul, I. (2018). Dueling banjos: harmony and discord between ADHD and entrepreneurship. *Academy of Management Perspectives*, 32(2), 266–286. <https://doi.org/10.5465/amp.2016.0178>.
- Lerner, D., Verheul, I., & Thurik, R. (2019). Entrepreneurship and attention deficit/hyperactivity disorder: a large-scale study involving the clinical condition of ADHD. *Small Business Economics*, 53, 381–392. <https://doi.org/10.1007/s11187-018-0061-1>.
- Lewin, K. (1935). *A dynamic theory of personality: selected papers*. New York: McGraw-Hill.
- Lewin, K. (1952). *Field theory in social science: selected theoretical papers*. New York: Harper & Row.
- Logan, J. (2009). Dyslexic entrepreneurs: the incidence; their coping strategies and their business skills. *Dyslexia*, 15(4), 328–346. <https://doi.org/10.1002/dys.388>.
- Magnusson, D., & Torestad, B. (1993). A holistic view of personality: a model revisited. *Annual Review of Psychology*, 44(1), 427–452. <https://doi.org/10.1146/annurev.ps.44.020193.002235>.
- Markman, G. D., & Baron, R. A. (2003). Person–entrepreneurship fit: why some people are more successful as entrepreneurs than others. *Human Resource Management Review*, 13(2), 281–301. [https://doi.org/10.1016/S1053-4822\(03\)00018-4](https://doi.org/10.1016/S1053-4822(03)00018-4).
- Meyer, A. D., Tsui, A. S., & Hinings, C. R. (1993). Configurational approaches to organizational analysis. *Academy of Management Journal*, 36(6), 1175–1195. <https://www.jstor.org/stable/256809>.
- Miner, J. (1997). A psychological typology and its relationship to entrepreneurial success. *Entrepreneurship & Regional Development*, 9(4), 319–334. <https://doi.org/10.1177/0021886300361003>.
- Miner, J. B., Smith, N. R., & Bracker, J. S. (1994). Role of entrepreneurial task motivation in the growth of technologically innovative firms: interpretations from follow-up data. *Journal of Applied Psychology*, 79(4), 627–630. <https://doi.org/10.1037/0021-9010.79.4.627>.
- Misangyi, V. F., & Acharya, A. G. (2014). Substitutes or complements? A configurational examination of corporate governance mechanisms. *Academy of Management Journal*, 57(6), 1681–1705. <https://doi.org/10.5465/amj.2012.0728>.
- Misangyi, V. F., Greckhamer, T., Furnari, S., Fiss, P. C., Crilly, D., & Aguilera, R. V. (2017). Embracing causal complexity: the emergence of a neo-configurational perspective. *Journal of Management*, 43(1), 255–282. <https://doi.org/10.1177/0149206316679252>.
- Muñoz, P. (2018). A cognitive map of sustainable decision-making in entrepreneurship: a configurational approach. *International Journal of Entrepreneurial Behavior & Research*, 24(3), 787–813. <https://doi.org/10.1108/IJEBR-03-2017-0110>.
- Muñoz, P., & Kibler, E. (2016). Institutional complexity and social entrepreneurship: a fuzzy-set approach. *Journal of Business Research*, 69(4), 1314–1318. <https://doi.org/10.1016/j.jbusres.2015.10.098>.
- Muñoz, P., & Kimmitt, J. (2019). Social mission as competitive advantage: a configurational analysis of the strategic conditions of social entrepreneurship. *Journal of Business Research*, 101, 854–861. <https://doi.org/10.1016/j.jbusres.2015.10.098>.
- Naldi, L., Nordqvist, M., Sjöberg, K., & Wiklund, J. (2007). Entrepreneurial orientation, risk taking, and performance in family firms. *Family Business Review*, 20(1), 33–47. <https://doi.org/10.1111/j.1741-6248.2007.00082.x>.
- Nicolaou, N., & Shane, S. (2014). Biology, neuroscience, and entrepreneurship. *Journal of Management Inquiry*, 23(1), 98–100. <https://doi.org/10.1177/2F1056492613485914>.
- Nicolaou, N., Shane, S., Cherkas, L., & Spector, T. D. (2008). The influence of sensation seeking in the heritability of entrepreneurship. *Strategic Entrepreneurship Journal*, 2(1), 7–21. <https://doi.org/10.1002/sej.37>.
- Nofal, A. M., Nicolaou, N., Symeonidou, N., & Shane, S. (2018). Biology and management: a review, critique, and research agenda. *Journal of Management*, 44(1), 7–31. <https://doi.org/10.1177/2F0149206317720723>.
- Ordanini, A., & Maglio, P. P. (2009). Market orientation, internal process, and external network: a qualitative comparative analysis of key decisional alternatives in the new service development. *Decision Sciences*, 40(3), 601–625. <https://doi.org/10.1111/j.1540-5915.2009.00238.x>.
- Pappas, I. O., Kourouthanassis, P. E., Giannakos, M. N., & Chrissikopoulos, V. (2016). Explaining online shopping behavior with fsQCA: the role of cognitive and affective perceptions. *Journal of Business Research*, 69(2), 794–803. <https://doi.org/10.1016/j.jbusres.2015.07.010>.
- Pham, M. T. (2004). The logic of feeling. *Journal of Consumer Psychology*, 14(4), 360–369. [https://doi.org/10.1207/s15327663jcp1404\\_5](https://doi.org/10.1207/s15327663jcp1404_5).
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>.
- Ragin, C. C. (2006). Set relations in social research: evaluation their consistency and coverage. *Political Analysis*, 14(3), 291–310. <https://doi.org/10.1093/pan/mpj019>.
- Ragin, C. C. (2008a). *Redesigning social inquiry: fuzzy sets and beyond*. Chicago: University of Chicago Press. <https://doi.org/10.7208/chicago/9780226702797.001.0001>.
- Ragin, C. C. (2008b). User’s guide to fuzzy-set/qualitative comparative analysis. [www.fsqca.com](http://www.fsqca.com), accessed 30.10.2019.
- Ragin, C. C. (2009). Qualitative comparative analysis using fuzzy sets (fsQCA). In B. Rihoux & C. C. Ragin (Eds.), *Configurational comparative methods: qualitative comparative analysis (QCA) and related techniques (applied social research methods)* (pp. 87–121). Thousand Oaks and London: Sage.
- Rauch, A., & Frese, M. (2007). Let’s put the person back into entrepreneurship research: a meta-analysis on the relationship between business owners’ personality traits, business creation, and success. *European Journal of Work and Organizational Psychology*, 16(4), 353–385. <https://doi.org/10.1080/13594320701595438>.

- Schecklmann, M., Ehlis, A. C., Plichta, M. M., Romanos, J., Heine, M., Boreatti-Hümmer, A., et al. (2008). Diminished prefrontal oxygenation with normal and above-average verbal fluency performance in adult ADHD. *Journal of Psychiatric Research*, 43(2), 98–106. <https://doi.org/10.1016/j.jpsychires.2008.02.005>.
- Schindehutte, M., Morris, M., & Allen, J. (2006). Beyond achievement: entrepreneurship as extreme experience. *Small Business Economics*, 27, 349–368. <https://doi.org/10.1007/s11187-005-0643-6>.
- Settles, R. E., Fischer, S., Cyders, M. A., Combs, J. L., Gunn, R. L., & Smith, G. T. (2012). Negative urgency: a personality predictor of externalizing behavior characterized by neuroticism, low conscientiousness, and disagreeableness. *Journal of Abnormal Psychology*, 121(1), 160–172. <https://doi.org/10.1037/a0024948>.
- Sieger, P., Gruber, M., Fauchart, E., & Zellweger, T. (2016). Measuring the social identity of entrepreneurs: scale development and international validation. *Journal of Business Venturing*, 31(5), 542–572. <https://doi.org/10.1016/j.jbusvent.2016.07.001>.
- Vallerand, R. J., Mageau, G. A., Ratelle, C., Leonard, M., Blanchard, C., Koestner, R., & Gagne, M. (2003). Les passions de l'ame: on obsessive and harmonious passion. *Journal of Personality and Social Psychology*, 85, 756–767. <https://doi.org/10.1037/0022-3514.85.4.756>.
- Verheul, I., & Thurik, R. (2001). Start-up capital: “does gender matter?”. *Small Business Economics*, 16(4), 329–345. <https://doi.org/10.1023/A:1011178629240>.
- Verheul, I., Block, J., Burmeister-Lamp, K., Thurik, R., Tiemeier, H., & Turturea, R. (2015). ADHD-like behavior and entrepreneurial intentions. *Small Business Economics*, 45(1), 85–101. <https://doi.org/10.1007/s11187-015-9642-4>.
- Verheul, I., Rietdijk, W., Block, J., Franken, I., Larsson, H., & Thurik, R. (2016). The association between attention-deficit/hyperactivity (ADHD) symptoms and self-employment. *European Journal of Epidemiology*, 31(8), 793–801. <https://doi.org/10.1007/s10654-016-0159-1>.
- Wach, D., Stephan, U., & Gorgievski, M. (2016). More than money: developing an integrative multi-factorial measure of entrepreneurial success. *International Small Business Journal*, 34(8), 1098–1121. <https://doi.org/10.1177/2F0266242615608469>.
- Wertheimer, M. (1938). Gestalt theory. In W. D. Ellis (Ed.), *A source book of Gestalt psychology* (pp. 1–11). New York: Harcourt (original work published in 1924).
- Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: using a structural model of personality to understand impulsivity. *Personality and Individual Differences*, 30(4), 669–689. [https://doi.org/10.1016/S0191-8869\(00\)00064-7](https://doi.org/10.1016/S0191-8869(00)00064-7).
- Wiklund, J., & Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal*, 24(13), 1307–1314. <https://doi.org/10.1002/smj.360>.
- Wiklund, J., Patzelt, H., & Dimov, D. (2016). Entrepreneurship and psychological disorders: how ADHD can be productively harnessed. *Journal of Business Venturing Insights*, 6, 14–20. <https://doi.org/10.1016/j.jbvi.2016.07.001>.
- Wiklund, J., Yu, W., Tucker, R., & Marino, L. (2017). ADHD, impulsivity, and entrepreneurship. *Journal of Business Venturing*, 32(6), 627–656. <https://doi.org/10.1016/j.jbusvent.2017.07.002>.
- Wiklund, J., Hatak, I., Patzelt, H., & Shepherd, D. (2018). Mental disorders in the entrepreneurship context: when being different can be an advantage. *Academy of Management Perspectives*, 32(2), 182–206. <https://doi.org/10.5465/amp.2017.0063>.
- Williams, L. J., Hartman, N., & Cavazotte, F. (2010). Method variance and marker variables: a review and comprehensive CFA marker technique. *Organizational Research Methods*, 13(3), 477–514. <https://doi.org/10.1177/1094428110366036>.
- Wisnans, A., Thurik, R., Verheul, I., Torrès, O., & Kamei, K. (2020). Attention-deficit hyperactivity disorder symptoms and entrepreneurial orientation: a replication note. *Applied Psychology*, 69(3), 1093–1112. <https://doi.org/10.1111/apps.12247>.
- Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *Journal of Business Research*, 66(4), 463–472. <https://doi.org/10.1016/j.jbusres.2012.12.021>.
- Woodside, A. G. (2014). Embraceperformmodel: complexity theory, contrarian case analysis, and multiple realities. *Journal of Business Research*, 67(12), 2495–2503. <https://doi.org/10.1016/j.jbusres.2014.07.006>.
- Yu, W., Wiklund, J., & Perez-Luno, A. (2019). ADHD symptoms, entrepreneurial orientation and firm performance. *Entrepreneurship Theory & Practice*. <https://doi.org/10.1177/2F1042258719892987>.
- Zaefarian, G., Thiesbrummel, C., Henneberg, S. C., & Naudé, P. (2017). Different recipes for success in business relationships. *Industrial Marketing Management*, 63(1), 69–81. <https://doi.org/10.1016/j.indmarman.2016.12.006>.
- Zhao, H., Seibert, S. E., & Lumpkin, G. T. (2010). The relationship of personality to entrepreneurial intentions and performance: a meta-analytic review. *Journal of Management*, 36(2), 381–404. <https://doi.org/10.1177/2F0149206309335187>.

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