

6-11-2016

## ENTREPRENEURIAL INTENTIONS, BEHAVIOR, ADHD, & FLOW

Daniel A. Lerner

*Deusto Business School, Spain, daniel.lerner@colorado.edu*

Ingrid Verheul

*Erasmus University, Netherlands*

---

### Recommended Citation

Lerner, Daniel A. and Verheul, Ingrid (2016) "ENTREPRENEURIAL INTENTIONS, BEHAVIOR, ADHD, & FLOW," *Frontiers of Entrepreneurship Research*: Vol. 36 : Iss. 3 , Article 1.

Available at: <https://digitalknowledge.babson.edu/fer/vol36/iss3/1>

This Paper is brought to you for free and open access by the Entrepreneurship at Babson at Digital Knowledge at Babson. It has been accepted for inclusion in Frontiers of Entrepreneurship Research by an authorized editor of Digital Knowledge at Babson. For more information, please contact [digitalknowledge@babson.edu](mailto:digitalknowledge@babson.edu).

## ENTREPRENEURIAL INTENTIONS, BEHAVIOR, ADHD, & FLOW



*Daniel A. Lerner, Deusto Business School, Spain*  
*Ingrid Verheul, Erasmus University, Netherlands*

### ABSTRACT

Entrepreneurial intentions are typically theorized to precede entrepreneurial action. However, many people do not follow-through on intentions. This raises questions regarding the link between ADHD (Attention Deficit/Hyperactivity Disorder) and entrepreneurship. On the one hand, individuals with ADHD may be among the least likely to follow-through on intentions. Alternatively, ADHD may facilitate entrepreneurial behavior, since action is prepotent. With a sample of over 9800 individuals, we tested potential links between *actual* ADHD, entrepreneurial intentions, action, and flow. The clinical condition of ADHD positively predicted not just entrepreneurial intentions, but also entrepreneurial action. Our results replicate and extend recent findings linking ADHD and entrepreneurship, using the stricter conceptualization of actual ADHD (a clinical diagnosis). In spite of downsides, ADHD enhances the odds of entrepreneurial action.

### INTRODUCTION

Entrepreneurial intentions are central to extant nascent entrepreneurship theory, and empirically relevant to predicting the occurrence of action *ex ante*. However, the coupling between entrepreneurial intentions and behavior is imperfect, with many individuals never following through on such intentions (van Gelderen, Kautonen, & Fink, 2015). This raises an interesting question in relation to recent findings. Verheul and colleagues (2015) find that ADHD is positively linked to intentions. Nevertheless, individuals with ADHD may be among the least likely to follow-through on intentions (e.g. Barkley et al., 2008). On the other hand, ADHD may facilitate entrepreneurial behavior – since action rather than deliberation is prepotent (Wiklund, Patzelt, & Dimov, 2014). This paper examines whether *actual* ADHD predicts entrepreneurial intentions and (nascent) entrepreneurial action. Building on research relating ADHD-type behavior to entrepreneurship (Lerner, 2016; Verheul et al., 2015; 2016), we offer the first large-scale study of actual ADHD on intentions and action. In doing so, we also provide a unique examination of nascent entrepreneurship by focusing on individuals who may particularly struggle with goal-directed intentions and follow-through.

Before elaborating specific hypotheses, we offer a few clarifications germane to the inquiry. We do not argue that ADHD is good or bad for entrepreneurial performance, examine the prevalence in full-time entrepreneurs, or start/limit our inquiry to individuals with entrepreneurial intentions. Rather, we start with a broad, professional oriented population (over 9,800 university students) and provide a focused test whether actually having the condition of ADHD positively predicts entrepreneurial intentions and the initiation of entrepreneurial action.

### HYPOTHESIS DEVELOPMENT

The starting point for our inquiry begins with the recent work of Verheul and colleagues (2015). These authors find ADHD-type behavior predictive of entrepreneurial career intentions. We begin by attempting to replicate and extend the ADHD-entrepreneurial intentions link using a more stringent conceptualization of ADHD – actual “attention-deficit/hyperactivity disorder.” In other words, rather than examining ADHD as a behavioral tendency, we take a clinical perspective and focus on whether, within a normal professional-oriented adult population (university students), those actually having the diagnosed *disorder* of ADHD espouse significantly higher entrepreneurial intentions. This approach fits with emergent research focusing on the link between mental health and entrepreneurship, and adds to scholarly discussion of the potential up-sides of traditionally *dark* or *problematic* constructs – such as narcissism (Wales et al., 2013), the dark triad (Hmieleski & Lerner, 2016), greed (Akhtar et al., 2013), and dyslexia (Gilger et al., 2016). Replicating and extending prior research indicating a positive link between ADHD and entrepreneurial intentions, we hypothesize:

*Hypothesis 1: Individuals' with actual ADHD (diagnoses) have higher entrepreneurial intentions.*

The consequences of ADHD may have opposing effects on actually undertaking entrepreneurial action. On one hand, even if individuals with ADHD espouse entrepreneurial preferences and intentions (Verheul et al., 2015), this does not mean they take action toward that end. For example, problems with sustained attention and distractibility may cause people

with ADHD to lose focus and engage in task-irrelevant activities (Halbesleben et al., 2013), and as such, entrepreneurial intentions may not be acted upon. Furthermore, although entrepreneurship is generally perceived to involve risky, complex and innovative activities, the reality of actually starting a business may be less exciting or motivating. In particular, starting a firm involves many tasks that are formal, protracted, administrative, and require attention to detail. Individuals with ADHD not only struggle with such activities, but also perceive them as less attractive (e.g., Barkley, 1997). Thus, when it comes to actually starting a venture, individuals with ADHD may be apt to procrastinate action or be otherwise distracted by more stimulating possibilities (including *thinking* about other opportunities). Following this line of reasoning one might expect individuals with ADHD to be less likely to take entrepreneurial action.

However, it could be otherwise, considering entrepreneurship requires an action-oriented approach (e.g., Sarasvathy, 2001) and findings that intentions may not always precede action (Kautonen et al., 2015). In relation to the latter, an individual could take action somewhat on impulse rather than on the basis of consciously held intentions/goals. Accordingly, we individually consider intentions and action. Within the context of studying entrepreneurial or other career intentions and ADHD, not presuming intentions always precede behavior is even more pertinent – since ADHD individuals often have particular difficulty in planning and committing to a career (Painter et al., 2008) and are prone to take action without deliberation (Barkley et al., 2008). In individuals with ADHD action itself is often prepotent (will be expressed absent top-down restraint). This suggests that, at least for experimenting with entrepreneurship, those with ADHD may proceed based on *less-reasoned* more impulse-driven actions, without much if any consideration of potential consequences. In this respect, ADHD's disinhibition (e.g. Barkley, 1997; Lerner, 2016) promotes action. Additionally, it allows the possibility of opportunistic action independent of ex ante conscious intended goals. The action-oriented behavioral logic of ADHD (and concomitant lack of reflection/deliberation) can bypass what Van Gelderen and colleagues (2015) found to be inhibitors of entrepreneurial action – “action-related fear, doubt, and aversion.” This implies a possible positive association between ADHD and entrepreneurial action.

While apparently juxtaposing, the differential potential effects of ADHD on entrepreneurial action are largely emblematic of the different activities and stages of the entrepreneurial process – and whether consciously held intentions necessarily precede and underlie (all) action. Notwithstanding the later importance of successfully regulating heterogeneous activities over time, at the earliest stage, entrepreneurial action is primarily about initiating entrepreneurial behavior in spite of relatively extreme uncertainty. Consequently, we posit individuals' with ADHD will be more likely to take action, given the behavioral disinhibition described above. We hypothesize:

*Hypothesis 2: Individuals' with actual ADHD (diagnoses) are more likely to engage in entrepreneurial behavior, i.e. act towards venture formation than those without ADHD.*

Not yet considered in the emerging scientific research involving ADHD and entrepreneurship is the notion of *hyper-focus*. Popular press and books by practicing clinicians suggest that while ADHD individuals particularly struggle and fail to pay attention to disinteresting activities, they readily (if not overly) become absorbed and hyper-focus on activities of interest (Archer, 2014; Hallowell & Ratey, 2011). Of course, non-ADHD individuals, compared to themselves, are also better able to maintain attention on more interesting activities. The difference, central to the clinical disorder of ADHD in adults, is the significant deficit in attentional regulation. In essence, unlike the non-ADHD individual with more normally distributed attention, the ADHD individual is apt to be highly unfocused/distractible on activities of little interest (having abnormal difficulty sustaining attention) – and yet otherwise be hyper-focused in activities of interest. The hyper-focus suggested in ADHD is akin to what other non-clinical psychology literature refers to as the concept of flow, defined as a positive experiential state in which individuals are completely absorbed by an activity that they enjoy and feel in control of (Csikszentmihalyi, 1997).

Entrepreneurship, a career characterized by high levels of challenge and outcome uncertainty, can trigger highly motivated individuals to show peak performance and enter a state of flow when working on the challenging intrinsically interesting demands of a venture (Schindehutte et al., 2006). The absorbing focus that individuals experience in interesting challenging activities may contribute to individuals with ADHD self-selecting toward the stimulation of a career in entrepreneurship, given its ability to accommodate one's interests (e.g. via self-selected industry/role) and higher risk-preferences (Verheul et al., 2015). More simply, to the extent an ADHD individual is disposed to be hyper-focused on that of interest, the potential of distractibility inhibiting action is reduced. Thus (on one hand), flow might positively moderate the hypothesized effect of ADHD on action.

Alternatively, to the extent that the hyper-focus of ADHD mirrors flow, for ADHD individuals, flow (as an additional variable) might add little explanatory value. In other words: if ADHD typically involves a flow-like hyper-focus on activities of interest, individuals with ADHD would report flow proclivities, and for them flow may not explain incremental (unique)

variance. For them flow is not negative, but rather may already be captured to a considerable degree within ADHD/ADHD's hyper-focus (and thus would show a relatively flat incremental effect). Since non-ADHD individuals may or may not show flow (Csikszentmihalyi, 1997), likely being more heterogeneous in it as a group, higher flow proclivity in non-ADHDs may positively affect their likelihood of action. In other words: flow might be a unique positive predictor of action for individuals without ADHD.

In any case, it reasons that individuals who are more apt to become engrossed in something of interest would (on average) be more apt to take action. Given the relative paucity of prior research and extant theory upon which to offer a well specified directional interaction with flow as it relates to ADHD and entrepreneurial action, for the purposes of exploration we simply hypothesize:

*Hypothesis 3: Flow moderates the relationship between ADHD and the likelihood of action.*

## METHOD

Given the research question, we were not interested in full-time entrepreneurs or employees -- but rather in a population heterogeneous in career intentions (i.e. with and without entrepreneurial intentions), and in whether they have started undertaking entrepreneurial activities. Accordingly, following Verheul and colleagues (2015), we sampled almost 10,000 adults. The data collection included the following variables:

1. *ADHD* – as clinical diagnosis (yes/no);
2. *Attentional Flow* – based on the Flow State Scale's 'focused concentration' dimension (Jackson & March, 1996; Quinn, 2005);
3. *Entrepreneurial Intentions* – based on Linan and Chen (2009); for robustness and replication, also, operationalized dichotomous with post-secondary career intention (Verheul et al, 2015);
4. *Entrepreneurial Behavior/Action* – operationalized as whether the individual had acted toward venture formation, i.e., was in the process of starting or already running a business;
5. Relevant control variables (gender, age, self-employed parents, academic performance, management study).

Our final sample consists of the approximately 9,800 students who participated in GUESSS Netherlands 2014. Comparing the GUESSS Netherlands sample with the global GUESSS sample, reported in Sieger et al. (2014), our sample is representative in terms of age (median 22 years), gender (~60% female), management students (~20%), and rate of self-employed parents (~30%). In terms of ADHD, 4.2% reported to have been diagnosed with ADHD; this is comparable to the adult ADHD community prevalence rates in the Netherlands (5%) and more broadly (3.4% across 10 countries according to World Health Organization studies) (de Graaf, et al., 2008). Sample characteristics and correlations among the variables are presented in Table 1. Differences in reported Ns throughout are due to missing data from some subjects (SPSS pairwise exclusion).

*Table 1: Descriptive Statistics and Correlations*

	Mean	SD	Min.	Max.	1	2	3	4	5	6	7	8	9
ADHD	0.04	0.20	0	1									
Flow	5.36	1.07	1	7	.03								
Parent entrepreneur	0.31	0.46	0	1	.02	.02							
Academic performance	4.92	0.93	1	7	-.04	.11	.02						
Mgmt. Major	0.21	0.41	0	1	-.01	-.004	.06	.02					
Age	22.40	3.39	17	40	.04	.02	-.06	.03	-.05				
Gender	0.38	0.49	0	1	.04	-.01	-.01	-.004	.09	.08			
Intentions (dummy)	0.05	0.21	0	1	.03	.05	.03	.001	.03	.05	.09		
Intentions (continuous)	3.28	1.76	1	7	.03	.15	.14	.01	.18	-.03	.16	.25	
Action	0.13	0.33	0	1	.06	.06	.08	.03	.06	.06	.17	.43	.38

N=9749; All correlations  $\geq |.02|$  are significant at 5% or less; correlations  $\geq |.03|$  are significant at 1% or less.

## RESULTS

Replicating and extending prior findings (Verheul et al., 2015), based on the stricter conceptualization and operationalization, actual ADHD (diagnosis) positively predicted entrepreneurial intentions (H1) robust to either operationalization (Table 2, Models 1a-1d). Furthermore, actual ADHD also positively predicted entrepreneurial action (H2) robust to all models (Table 3, Models 2a-2d). Specifically, we observe that university enrolled adults with ADHD are almost 2-times, i.e. almost 100% more likely to have initiated entrepreneurial action than those without; furthermore we find quite stable odds-ratio estimates, ranging from 1.7 to 1.9 across models (2a-2d). The relatively low  $R^2$  of the models in Tables 2 and 3 are in line with other entrepreneurship research. It indicates that there are myriad factors influencing whether an individual is interested and will engage in entrepreneurial behavior. Moreover, given the relatively few individuals with clinical ADHD diagnoses (~4%) in the total sample, very low  $R^2$ s are not just normal but mathematically guaranteed, with easily interpretable odds-ratios being much more informative. Building on prior research, our results provide the logical next steps: replication based on actual *A.D.H.D.* Furthermore, considering the age and nature of the sample, the design offers the advantage of capturing individuals prior to the possibility of being *pushed* into entrepreneurship. Given the up and downsides of ADHD and of entrepreneurship, the results extend prior research and have implications for future research (e.g. examining the effect on organizing outcomes/performance).

Table 2: OLS and Logistic Regression Results, Predicting Entrepreneurial Intention

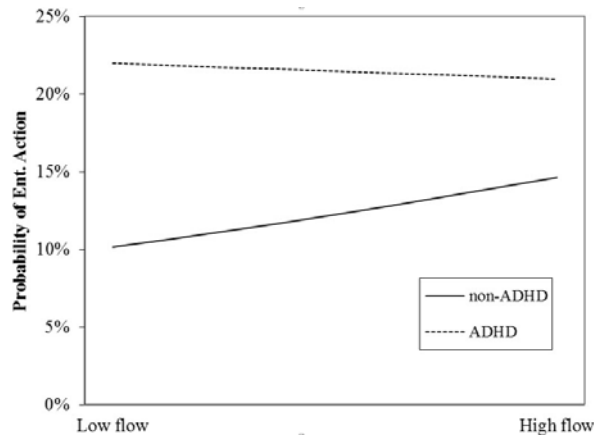
Dependent Variable	Entrepreneurial Intentions			
	Continuous (Linan & Chen 2009)		Dichotomous (Verheul et al., 2015)	
Model	1a: Simple Main-effect	1b: with Controls	1c: Simple Main-effect	1d: with Controls
Variables	B Estimates (standard errors)		Odds Ratios: Exp(B) (95% confidence interval)	
Constant	3.268*** (0.019)	3.109*** (0.152)	0.048***	0.009***
Age		-0.015* (0.005)		1.053*** (1.028-1.078)
Self-Employed Parents		0.495*** (0.039)		1.429*** (1.177-1.736)
Academic Performance		0.001 (0.019)		0.998 (0.904-1.101)
Management Major (0,1)		0.688*** (0.044)		1.322** (1.068-1.636)
Gender (male=1)		0.536*** (0.037)		2.151*** (1.778-2.602)
ADHD Diagnosis (0,1)	0.231* (0.095)	0.200* (0.092)	1.802** (1.247-2.605)	1.625* (1.119-2.360)
Model				
$R^2$ // Nagelkerke $R^2$	0.001	0.071	0.003	0.036
Chi-square			8.511**	113.849***
-2 Log likelihood			3770.50	3631.53
N	9,211	9,124	9,869	9,770

Table 3: Logistic Regression Results, Predicting Entrepreneurial Action

Dependent Variable	Entrepreneurial Action (yes=1)			
	2a: Simple Main-effect	2b: with controls	2c: with controls & flow	2d: with controls, flow, interaction
<b>Model</b>				
<b>Variables</b>	Odds Ratios: Exp(B) (95% confidence interval)			
Constant	0.141***	0.017***	0.019***	0.019***
Age		1.039*** (1.022-1.057)	1.039*** (1.022-1.056)	1.039*** (1.022-1.056)
Self-Employed Parents		1.665*** (1.469-1.888)	1.650*** (1.454-1.872)	1.645*** (1.450-1.866)
Academic Performance		1.111** (1.041-1.187)	1.088* (1.019-1.162)	1.088* (1.019-1.163)
Management Major (0,1)		1.355*** (1.179-1.558)	1.351*** (1.175-1.554)	1.352*** (1.175-1.555)
Gender (male=1)		2.709*** (2.394-3.066)	2.710*** (2.394-3.068)	2.719*** (2.401-3.078)
Attentional Flow			1.187*** (1.118-1.260)	1.214*** (1.140-1.293)
Flow * ADHD				0.769** (0.626-0.945)
<b>ADHD Diagnosis (0,1)</b>	<b>1.926***</b> (1.510-2.457)	<b>1.792***</b> (1.393-2.305)	<b>1.730***</b> (1.343-2.228)	<b>1.830***</b> (1.421-2.358)
<b>Model</b>				
Nagelkerke R <sup>2</sup>	0.005	0.077	0.083	0.084
Chi-square	24.795***	412.292***	440.128***	446.115***
-2 Log likelihood	7513.90	7037.85	6992.75	6986.76
N	9,869	9,770	9,749	9,749

Significant at: †=0.10, \*=0.05, \*\*=0.01, \*\*\*=0.001, 2-tailed.

There was also a significant interaction with flow (H3). Higher flow increased the likelihood of entrepreneurial action in the non-ADHD individuals. This is shown in the Figure. Examining the scale items, the variable appears consistent with the hyper-focus on activities of interest often suggested to accompany ADHD. The significant positive correlation between ADHD and flow (Table 1), in conjunction with the main-effect of ADHD on action (H2) and the interaction observed would thus be consistent with the following. Individuals with ADHD indeed typically report greater flow (related to ADHD hyper-focus), and since such individuals are already about 70-80% more likely to act (Models 2b-d), for ADHD-individuals flow adds negligible incremental explanatory power (the Figure's approximately flat line, and the relatively offsetting Flow versus Flow\*ADHD coefficients). Concurrently, with higher flow propensity generally linked to action (Model 2c), it uniquely increases the marginal likelihood of action in non-ADHD individuals (the ~50% increase in likelihood of action for non-ADHD individuals).



### DISCUSSION & IMPLICATIONS

Most entrepreneurship literature is based on the premise that entrepreneurial intentions precede entrepreneurial action. However, many people never follow-through on such intentions (van Gelderen et al., 2015). This raises an important question in relation to recent findings linking ADHD and entrepreneurship. Our study replicates and extends findings linking ADHD and entrepreneurship, using a stricter conceptualization and measurement of ADHD, actual Attention-Deficit/Hyperactivity Disorder – a clinically diagnosed condition. The results find that, in spite of ADHD's downsides and individuals having sufficient disorder as to be clinically diagnosed, it positively rather than negatively affects the likelihood of entrepreneurial action. Given our focus and research design, we do not suggest ADHD is necessarily adaptive for venturing outcomes nor that our findings are generalizable to the extended entrepreneurial process. Rather, this work foments and contributes to various scholarly conversations, particularly those involving mental health or ADHD and entrepreneurship (e.g. Lerner, 2016; Verheul et al., 2015; Wiklund et al., 2014). It also serves as a basis for future research. For example, with ADHD individuals *almost 2-times more likely* to initiate the entrepreneurial action, it indicates the importance for studying the effects ADHD and other conditions once seen as aberrant in respect to entrepreneurship. This is particularly so once considering the otherwise squandered human capital, the costs of business failure and or the many adverse outcomes associated with unchanneled ADHD. Related research implications include highlighting the need for further study of the role of flow and hyper-focus in entrepreneurship – as well as when ADHD is a strength/weakness, and is adaptive/counter-productive in venturing. In regards practice and policy, understanding mental health and ADHD in particular has dark and bright sides for entrepreneurship has various implications. For example, it suggests the opportunity for applied research to help educators and clinicians focus on strengths (e.g., an imperturbable focus on activities of interest, a willingness to act) and compensate for weaknesses (e.g., distractibility, poor attention to detail in mundane activities). While more research is needed, this work offers a timely contribution and starting point – bridging current conversations of theoretical and practical relevance: such as the intentions--behavior link (e.g. van Gelderen et al., 2015), the ADHD--entrepreneurship link (e.g. Lerner, 2016; Verheul et al., 2015; Wiklund et al., 2014), and the general relevance of potentially dark or clinical constructs to entrepreneurship (e.g. Hmieleski & Lerner, 2016; Wales et al., 2013).

**CONTACT:** Daniel Lerner; daniel.lerner@colorado.edu; Deusto Business School, Bilbao, Spain.

**ACKNOWLEDGEMENTS:** The authors gratefully acknowledge the support of Dr. Roy Thurik.