

OPPORTUNITY PURSUIT AND THE DISINHIBITION PARADOX

by

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Opportunity Pursuit and The Disinhibition Paradox

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The perception, pursuit, and exploitation of opportunity are central to entrepreneurship (new venture, corporate, social) and some theories of behavioral strategy. While relatively unfettered cognition, appetitive impulse, and behavior may favor perceiving and acting on opportunities, such disinhibition may present a social liability and thus interfere with reaching opportunity exploitation. This dissertation examines the connection between disinhibition and nascent opportunity pursuit. Drawing primarily on psychological and entrepreneurial literature, this work develops hypotheses related to the effects of disinhibition in a would-be founder/entrepreneur on other individuals. The research focuses on the earliest stage of nascent entrepreneurial action. The underlying research motivation is based on abductive reasoning, triangulating existing findings, cases, and theory.

An experiment was designed to provide a focused, causal test of the research hypotheses. The design eliminated endogeneity issues, confounds, winners' bias, retrospective post-hoc bias, and other biases inherent to highly nascent entrepreneurship. The results shed light on a multilevel tension at the heart of early stage entrepreneurship.

In particular, previous research has shown a positive relationship between disinhibition and entrepreneurial intention, nascent entrepreneurial action, and being an entrepreneur. However results of the research presented here show a significant negative social effect of disinhibition. Specifically, apparent disinhibition in a potential founder has sizable adverse effects on others' assessments: of the founder, of the likelihood of venture success, and of interest in supporting (joining)

the venture. These findings indicate that an individual factor impelling individual entrepreneurial action presents a friction for advancing in the entrepreneurial process.

This research makes several contributions to existing literature. In relation to entrepreneurship, it contributes needed insight into the social psychology of nascent opportunity pursuit. In relation to the psychological sciences, it provides a vocationally contextualized examination of disinhibition. In connection with other work reviewed, this dissertation contributes to a developing disinhibition perspective of entrepreneurial action. In relation to other organizational literature, it suggests important cross-level tensions related to less inhibited actors and innovation. In relation to broader policy, it suggests the importance of programs and other interventions to harness entrepreneurial behavior and proclivities, and to channel disinhibition to productive ends.

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Contents

Chapter 1 Introduction.....	1
Overview	1
Nascent Venturing	2
The Basis for a Disinhibition—Entrepreneurship Connection and Tension	4
Chapter 2 Literature and Hypotheses.....	6
Opportunity Perception and Initial Pursuit	6
Beyond the Individual: Social Sphere Entrepreneurial Pursuit	10
Basic Psychology of Disinhibition	13
<i>What is (dis)inhibition? The General Term/Concept.....</i>	<i>14</i>
<i>Scientific Usage of the Term and Illustrations</i>	<i>15</i>
<i>Cognitive, Motivational, and Behavioral (Dis)Inhibition.....</i>	<i>16</i>
<i>ADHD Disinhibition</i>	<i>19</i>
<i>Summary.....</i>	<i>24</i>
Entrepreneurial Pursuit and Disinhibition	25
Chapter 3 Method.....	33
High-level Overview of Research Procedure	33
Motivation for Controlled Experiment, and Factorial Design Summary	34
Presentation of Experimental Stimuli: Rationale for Written Descriptions.....	37
The Written Descriptions: Independent Variable Manipulation and Other Information Presented	38
<i>Overview.....</i>	<i>38</i>
<i>Balancing Experimental Manipulation and Realism.....</i>	<i>39</i>
<i>Other Information and Adjustments in the Descriptions/Stimuli.....</i>	<i>42</i>
<i>Manipulation Check</i>	<i>44</i>
Dependent and Mediating Variables	45
<i>Judgments about the Target Entrepreneur</i>	<i>45</i>
<i>Judgments about Venture Success Likelihood.....</i>	<i>48</i>
<i>Interest in Joining the Entrepreneurial Pursuit.....</i>	<i>48</i>
<i>Controls.....</i>	<i>50</i>
Sample	52
Context provided to Sample	53
Pilot Testing of the Research Instrument.....	54
Data Checking	54
Sensitivity/Power Analysis.....	55
Chapter 4 Results.....	57
Data Overview	57
Item Scoring and Variables	58
Factor Analyses and Reliabilities	59
Variable Means and Standard Deviations.....	63
Manipulation Check	66
Possible Effect of Entrepreneurial Idea	68
Possible Order Effect.....	68
Disinhibition Main Effect Results	70
<i>Hypothesis 1</i>	<i>70</i>
<i>Hypotheses 2a-c.....</i>	<i>71</i>
<i>Hypotheses 3a-b</i>	<i>72</i>
<i>Hypotheses 5a and 6a.....</i>	<i>73</i>
<i>Test of ADHD Condition Effects with Repeated Measures GLM</i>	<i>74</i>
Other Tests and Results	76

Chapter 5 Discussion	87
Discussion of Findings	87
<i>Overall</i>	87
<i>General Social Interaction</i>	89
<i>Judgments About Potential Founders</i>	90
<i>Judgments about Venture Success Likelihood, and Interest in Joining the Venture</i>	93
Strengths, Limitations, and Future Research	94
<i>Design</i>	94
<i>Data Collection and Sample</i>	96
<i>Generalizability</i>	98
<i>Synopsis</i>	100
Practical Considerations	101
Conclusion	108
References.....	110

List of Tables

Table 1: Descriptions of Would-be Founders (Focal Stimuli).....	43
Table 2: Key Differences (Manipulation) and Similarities between Stimuli.....	44
Table 3: Summary of Primary Variables.....	59
Table 4: Rotated Factor Item Loadings, showing Interest to Interact, Generative and Administrative Assessments, and Interest to Join.....	62
Table 5: Full-sample Variable Means, Standard Deviations, and Mean Difference T-tests.....	64
Table 6: Conservative Half-sample Means, Standard Deviations, and Mean Difference T-tests, on Variables with Partial Order Effect.....	65
Table 7: Manipulation Check.....	66
Table 8: Results of General Linear Model (GLM) Repeated Measures Analyses – ADHD Disinhibition Condition as Independent Variable (Within-Subjects).....	75
Table 9: Rotated Factor Item Loadings, without Entrepreneur and Manager Competence Judgments.....	78
Table 10: Rotated Factor Item Loadings, including Entrepreneur and Manager Competence Judgments.....	78

List of Figures

Figure 1: Hypothesized Model (Main and Indirect Effects)	30
Figure 2: T-Test Difference Sensitivity Analysis, Power (X-axis) Needed to Detect True Effect Size (Y-axis)	56
Figure 3: Within-Subject Repeated Measures ANOVA Sensitivity Analysis, Power (X-axis) Needed to Detect True Effect Size (Y-axis)	56
Figure 4: Simplified Path Model	79
Figure 5: Path Tests based on Single Regressions	81
Figure 6: Path Tests based on Multiple Regressions	83
Figure 7: Path Test based on Single Regressions	83
Figure 8: Hierarchical Multiple Regression Results for Second and Third Step Variables	85

Chapter 1

Introduction

Overview

Entrepreneurship presents a tension. On one hand, the pursuit and exploitation of entrepreneurial opportunity drives new value creation, and is thus desired. On the other hand, opportunities involve uncertainty (something averse to most individuals), and opportunities of consequence reside beyond the cognitive and behavioral bounds of most actors (Gavetti, 2012). Accordingly, actors unfettered in thought and action are needed to initiate opportunity pursuit. Yet exploiting opportunities requires resources not held by the individual actor. For that reason, *would-be* founders must engage other individuals in spite of inertia and frictions favoring certainty and convention.

Thus, the understanding of opportunity pursuit necessitates a more complete picture of the social psychology of nascent entrepreneurship – namely the effect of the would-be founder on others' evaluations (of the would-be founder, the likelihood of venture success, and interest in supporting the pursuit). This is because others' perceptions and evaluations of the target individual are important determinants of their resource allocation decisions (e.g., Chen, Yao, & Kotha, 2009; Clark, 2008; MacMillan, Siegel, & Narasimha, 1985). Would-be founders who are not successful in securing resources from others fail to found organizations, since an organization is by definition more than a single individual.¹ Even individuals who are successful in founding an organization need later-stage resource acquisition (e.g., venture financing) to ultimately exploit entrepreneurial opportunities.

¹ Individual self-employment, while also an important area of study, is not the focus of this dissertation. Related to this, the term *would-be founder* is used to denote that an aspiring founder is a yet-to-be founder until founding an organization (of more than him or herself).

Prior research has uncovered founder characteristics such as gender or displays of passion affect other individuals' financing decisions (Chen, Yao, & Kotha, 2009; Fay & Williams, 1993). However, before arriving at the point of material venture financing, the would-be founder needs others to join the pursuit. Among other reasons, investors expect to see an organization, and a new organization's team is an important factor in future financing and outcomes (e.g., Beckman, Burton, & O'Reilly, 2007; Zacharakis & Meyer, 1998). Yet before there is a team, there is a would-be founder and other individuals. Nonetheless, the literature is surprisingly silent on would-be founder factors affecting others' non-financing judgments such as whether to join an entrepreneurial pursuit. Thus to fully understand nascent entrepreneurship, further social psychological inquiry is needed.

As the pursuit of opportunity is ultimately a social phenomenon, individuals' perceptions and judgments of entrepreneurial actors are a matter of consequence. This dissertation focuses on a particular would-be founder psychological characteristic, disinhibition, later discussed. While facilitating initial individual entrepreneurial action, disinhibition might have a paradoxical and ultimately negative effect on other individuals' judgments.

Nascent Venturing

Business venturing occurs when actors pursue opportunity. Past literature has documented differences between entrepreneurs and other groups (e.g., Busenitz & Barney, 1997). Recently, the literature has looked deeper into the individual—opportunity nexus, illuminating entrepreneurs' processes of opportunity recognition (e.g., Baron & Ensley, 2006; Gregoire, Barr, & Shepherd, 2009), the importance of networks (e.g., Jenssen, 2001; Hallen, 2008), and the effect of psychological characteristics of a founder on venture outcomes (e.g., Hmieleski & Baron, 2009). However, the existing literature is based on observable founders or

focused on factors of existing ventures (e.g., teams) and venture outcomes (e.g., firm performance or receiving venture capital). Relatively absent is a complete understanding of more nascent-stage phenomena. This includes questions related to why within a general population *some* individuals will explore and begin to pursue entrepreneurial opportunities and succeed or fail in getting others to join the pursuit – before a winner’s bias bifurcates founders and non-founders. Survivor bias is a serious issue for entrepreneurial research. Findings and theory are often limited to the early winning *exceptions*, considering estimates of “only half of aspiring founders succeed in creating new organizations that are ever recorded in public records (Aldrich, 1999)” (Davidsson & Honig, 2003: 311). Also there is a gap in the literature between opportunity recognition and the existence of new ventures. While the Panel Study of Entrepreneurial Dynamics (PSED) and related studies (e.g., Davidsson & Honig, 2003) have shed light on gestational activities of the start-up process (e.g., building a prototype) and some individual-level factors (e.g., the effect of individuals’ capital), such studies have not fully addressed the individual and social psychology of nascent entrepreneurship.

In relation to nascent entrepreneurship, before there can be a venture to finance, or venture team dynamics, there must be a new venture. For the existence of a new venture, an individual opportunity pursuit needs to have transitioned to some type of organizational opportunity pursuit. In terms of opportunity pursuit, individual factors positively associated with initiating entrepreneurial pursuits in a general population could be a social liability. For example, individual disinhibition, though impelling opportunity pursuit, might interfere with getting others involved in the pursuit. Since individual factors posing a social liability would reduce the likelihood of reaching the point of *founder* and *new venture* status, such factors would likely have eluded observation in organizational research to date.

The Basis for a Disinhibition—Entrepreneurship Connection and Tension

Entrepreneurship is characterized by uncertainty (Knight, 1921; McMullen & Shepherd, 2006) and action (Bird & Schjoedt, 2009; Frese, 2009). As uncertainty increases, calculative planned action becomes increasingly futile. Conscientious follow-through on established plans can become even counter-productive (cf. Knight, 1921; Sarasvathy, 2001). Since action based on incomplete knowledge and without the benefit of defined rules is the only way to advance under conditions of high uncertainty, and considering the time and resource constraints faced by nascent entrepreneurs, would-be founders often have little choice but to act somewhat more on impulse (cf. Knight, 1921; Sarasvathy, 2001). The higher the rate of doing (activity), the greater the potential for learning, advancement, and creative discovery (cf. Simonton, 2003). As noted by Frese (2009: 440) and others, “entrepreneurs [are and] have to be more active than normal employees and even managers (Utsch et al., 1999).” In conjunction with uncertainty undermining the potential of acting on established plans and parameters, this suggests that some hyperactivity and a proclivity to act more on impulse may favor (initiating) early-stage entrepreneurship, since such individual characteristics facilitate greater action under conditions of high uncertainty. Additionally, an atypical pattern of attention (e.g., defocused or picking up on *apparent* distractors) leads to atypical perception. This offers the potential to breach conventional cognitive bounds and can facilitate action in the presence of potential threats. This may be because of inattention to potential threats, unique insight, or both.

In line with the above, there are suggestions of greater behavioral disinhibition, specifically hyperactivity, impulsivity, and attention deficit, in entrepreneurs (Hayek & Harvey, 2012; Levander & Raccuia, 2001; Mannuzza et al., 1993; Tice, 2010). This type of disinhibition is elaborated in the next chapter. Past psychology literature (e.g., Canu et al., 2008; Chew et al.,

2009; Paulson et al., 2005) has however shown that the appearance or suggestion of a target individual as hyperactive, impulsive, or attention deficit (ADHD) has adverse effects on others' judgments of the target (e.g., the target is judged to possess more negative attributes or be less socially desirable). Yet the question exists as to the social effect in an entrepreneurial context. In the context of nascent entrepreneurial opportunity pursuit, is ADHD disinhibition a social liability? Or is it perceived by other individuals as more ambiguous, or potentially even a plus?

This dissertation follows past research that separately examined the effect of target entrepreneur characteristics, and the effect of ADHD disinhibition, on others. More specifically, my research is based on prior research examining: 1) the effect of target entrepreneur characteristics on others' judgments of the target and entrepreneurial pursuits associated with the target (e.g., Baron, Markman, & Bollinger, 2006), and 2) the effect of ADHD disinhibition in a target on others' judgments of the target outside an entrepreneurial context (Canu et al., 2008; Chew, et al., 2009; Paulson et al., 2005). This dissertation examines the effect of ADHD-type disinhibition in an entrepreneurial target on other individuals' judgments of the target and the associated entrepreneurial pursuit.

This work contributes to our understanding of social psychology and nascent entrepreneurship. In particular, I test the effect of ADHD-type disinhibition in a target entrepreneur on others' perceptions of the entrepreneur, judgments of the likelihood of success, and interest in joining the pursuit. The work contributes to the organizational literature by surfacing an important tension in opportunity pursuit (e.g., that a facilitator of individual nascent entrepreneurial behavior appears to impair transition to the social pursuit of opportunity). The work can also contribute to the psychology literature by advancing the understanding of the social effects of ADHD disinhibition and related vocational behavior.

Chapter 2

Literature and Hypotheses

In this section, I first discuss entrepreneurship. Then, focusing on basic psychology, I review disinhibition, ultimately focusing on ADHD-type disinhibition. Subsequently, I discuss the association between disinhibition and nascent opportunity pursuit, concluding with hypotheses about the social psychological effects of would-be founder disinhibition on other individuals.

Opportunity Perception and Initial Pursuit

Entrepreneurship is fundamentally about perception, pursuit, and exploitation of opportunity (Shane & Venkataraman, 2000; Davidsson, 2003; Alvarez & Barney, 2005). Considerable scholarly attention has been paid to the individual—opportunity nexus (see Shane, 2012, for a review). The literature notes that individuals vary in their proclivities to recognize entrepreneurial opportunities, to form ventures, and to ultimately exploit opportunities (Baron, 2004; 2007; Shane, 2003; Shane & Venkataraman 2000). This dissertation focuses on initial pursuit of opportunity and does not attempt to consider differences in the survival or performance of existing ventures.

Entrepreneurial opportunities are the possibility of an economically viable product, service, or conversion process (Shane & Venkataraman, 2000). Given ex-ante uncertainty about the economic outcome of an entrepreneurial pursuit, opportunity recognition or perception resides in the eye of the beholder. In other words, whether an entrepreneurial idea is recognized as an opportunity depends on the perceiver's belief as to whether the idea could generate net benefit if enacted (e.g., Gregoire, Barr, & Shepherd, 2009). Thus opportunity recognition or

perception is subjective cognition. Moving beyond the perception of opportunity, and considering the central question of why some and not others pursue entrepreneurial action, it is important to consider the nature of entrepreneurship itself.

The nature of entrepreneurial action and the barriers to it have long been discussed. Knight (1921) suggests that inherent and irreducible uncertainty is the source of entrepreneurial profit. Based on Knight (1921), entrepreneurial action requires an actor with relatively less concern for prediction and calculative expected value. This is because under true uncertainty neither is possible. This suggests that, all else equal, some level of deviation from or disregard for established business thinking favors entrepreneurial cognition and action, with such an approach serving to overcome the chasm of uncertainty present for calculative planned action.

Schumpeter (1934) identifies internal and external impediments to individuals' consideration of entrepreneurial opportunity and entrepreneurial action. Schumpeter highlights how the potential entrepreneur may be inhibited psychologically, both from within and by the social sphere. In relation to restraining internal factors, Schumpeter (1934: 84) notes that an entrepreneur operates outside of "accustomed channels" leaving him "without those data for his decisions and those rules of conduct which are usually very accurately known to him." Continuing on, "it is not only objectively more difficult to do something new than what is familiar and tested by experience, but the individual feels reluctance to do it ... even if the objective difficulties did not exist" (Schumpeter, 1934: 86).

Regarding restraining social forces, Schumpeter (1934: 86) notes,

[for the entrepreneur there is] the reaction of the social environment against one who wishes to do something new. Any deviating conduct by a member of a social group is condemned, ... mere astonishment at the deviation, even merely noticing it, exercises a pressure on the individual. ... Surmounting this opposition is always a special kind of task which does not exist in the customary course of life, a task which also requires a special kind of conduct.

The essential point is, for entrepreneurial pursuit, an actor needs to be sufficiently unconstrained internally and in relation to the social sphere. Other scholars (e.g., Goss, 1995) have also noted and considered this inhibitory effect of the social sphere on entrepreneurial pursuit. The research suggests that entrepreneurial cognition and particularly action requires going beyond conventional thought and expressing less-inhibited behavior. Concurrently, would-be entrepreneurs still exist within a social sphere from which they must secure resources (e.g., initial labor). Thus, while a lack of inhibitions might facilitate entrepreneurial action by individuals, this presents a tension. The lack of inhibition may undermine the capacity of an individual to draw on others and operate within a social sphere.

To understand nascent entrepreneurship, researchers have typically examined observable full-time entrepreneurs. For example, opportunity recognition in existing entrepreneurs has received scholarly attention (e.g., Baron & Ensley, 2006; Gregoire & Shepherd, 2012). Yet these studies, like others sampling entrepreneurs, limit the sample to *winner*s – i.e., individuals who have: 1) successfully passed the idea stage, 2) achieved venture formation, and 3) survived at least a year. The Panel Study on Entrepreneurial Dynamics and related research (e.g., Davidsson & Honig, 2003) has attempted to examine the opportunity pursuit activities of nascent entrepreneurs, and socio-demographic differences between nascent entrepreneurs and the overall population. These studies suggest the importance of human, social, and financial capital in predicting a nascent entrepreneur status (yes/no), entrepreneurial behaviors (e.g., developing a

business plan), and nascent venture outcomes (e.g., sales revenues) (e.g., Davidsson, 2006; Davidsson & Honig, 2003). However, in relation to individual and social psychology, the literature is still relatively silent in understanding the broader population who may begin to pursue opportunity.

What of those who begin to pursue opportunities but are unsuccessful in engaging others, and are thus apt to disappear before observation by organizational researchers? Even for new ventures reaching the point of observation by the Small Business Administration, 25% disappear within a year (Shane, 2008). This suggests that the pool of observable founders churns with survivor bias. Yet theory and practice necessitate understanding the early abandonments and failures as well as the survivors. Recent work by Yang and Aldrich (2012) and by Hunt and Lerner (2012; 2013) offers a powerful illustration of the propensity of entrepreneurship research to miss the early abandonments and failures, and the effect on empirical results and theory. So questions remain as to: *if* what we know of observable entrepreneurs generalizes to potential or would-be entrepreneur populations, *if* a survivor bias has colored our understanding of opportunity recognition and nascent entrepreneurship, and (the focus of this dissertation) *if* a particular psychological factor (i.e., disinhibition) appearing to facilitate initiation of opportunity pursuit presents a social liability (which would reduce the likelihood of arriving to the point of venture formation and observation by prior research).

Many have noted (e.g., Baron 2007: 167) that opportunity pursuit by would-be founders is “crucial to the entrepreneurial process; in the absence of action by individual[s], there would simply be no entrepreneurship and no new ventures.” As highlighted by Bird and Schjoedt (2009: 327), “The end of all the cognition [related to entrepreneurial activity] ... is to take some action in the world, and by doing so, give rise to a venture, an organization.” In other words,

ideas must be translated into actions for any entrepreneurial pursuit. Before any action can be taken by a team or by other individuals, the initial opportunity perceiver must have initiated pursuit and then along the way engaged other individuals. So while initial nascent entrepreneurial behavior is first individual, given a would-be founder's finite resources (cognitive, behavioral, temporal, financial), pursuing opportunities to the point of exploitation requires more than the lone individual and gives rise to a firm (Zander, 2007).

Beyond the Individual: Social Sphere Entrepreneurial Pursuit

Beyond the initial individual-opportunity nexus, the pursuit of entrepreneurial opportunity requires resources. Resources are “input factors such as human capital (e.g., employees)... needed to create organizations” (Zott & Huy 2007: 70). While the specifics of what human and other resources are needed and how they are to be assembled varies by context, others possess needed resources. In other words, labor and other resources are needed from the social sphere for the would-be founder to enact the envisioned means-ends framework (Zander, 2007).

While scholars have paid considerable attention to start-up firm financing, less attention has been given to the earlier transition from an individual pursuit to an organizational pursuit. This is surprising considering that the incorporation of other individuals is a precursor to the firm and to later-stage financing. Others' subjective judgments about a would-be founder and entrepreneurial pursuit are germane to the point of potential transition from individual to organizational pursuit, given high uncertainty and limited if any objective evidence to consider likely ex-post outcomes.

Even in terms of later venture financing, subjective social judgments are involved in arriving to the point of formal consideration by potential investors. Founders and nascent

ventures not judged favorably based on a brief pitch will not “[reach] even the traditional first screening stage of the investor decision-making process – the evaluation of their business plan” (Clark, 2008: 258).

Before there can be a firm to finance, the yet-to-be founder must found an organization. This means that other individuals must be engaged. So, the would-be founder must present the entrepreneurial pursuit to other individuals (e.g., would-be labor), such that they perceive the pursuit to be an opportunity worthy of their attention and support. The pursuit can be expected to evolve over time, as the perceived opportunity evolves from a “hazy picture of the future state” (Zander, 2007: 1146) to a crisper higher-dimensional representation (Gavetti, 2012).

There are, however, material obstacles to engaging others in the pursuit. As Zander (2007: 1148) notes, “convincing other market participants of the value and correctness of the means-ends framework (Aldrich & Foil, 1994; Lounsbury & Glynn, 2001)” is problematic.

Asymmetrically dispersed knowledge and the creative element in entrepreneurial decision making represent a double-edged sword. On the one hand, it permits the [would-be] entrepreneur to discover and pursue a particular business opportunity, expecting that the uniqueness of insight can be turned into sizable profits. On the other hand, it tends to create problems because other individuals and firms affected by and needed in the exploitation process are unlikely to see and understand the logic of the new idea, or to share the same expectations, and as a result may resist or even actively oppose it (Zander, 2004: 1144).

Furthermore, the would-be founder cannot command or outright purchase others’ support. Although markets might exist for external sourcing of some labor (e.g., legal counsel), founders must bring some activity inside a new organization. This is necessarily the case as entrepreneurial opportunities represent incomplete existing markets. This means that the “entrepreneur must activate and coordinate resources beyond established market relationships”

(Zander, 2004: 1149). Thus the would-be founder must ask others to support the pursuit and accomplish this while lacking managerial fiat over yet-to-exist employees.

In sum, the would-be founder needs others to support the pursuit of subjective opportunity (e.g., committing their time and possibly part of their career). However, there are inherent obstacles to others' interest. As previously noted, opportunity pursuit requires individuals to go beyond what is established, is known to them, and can be readily specified (Schumpeter, 1934; Knight, 1921). Asymmetric knowledge and the creative element of entrepreneurial perception and pursuit suggest problems of cognitive incompleteness or incongruence between the would-be founder and others (Zander, 2007). Even if a would-be founder's creative idea and subjective opportunity is understood by others, others may be averse to the would-be founder or simply not interested in the entrepreneurial pursuit itself.

The creative component involved in entrepreneurship presents a social tension worth further noting. Entrepreneurial ideas involve at least some variation to the status quo, and thus novelty, uncertainty, and breach of convention. McMullen and Shepherd (2006: 133) explicitly note that uncertainty is "enhanced by the novelty intrinsic to entrepreneurial actions (Amabile, 1997; Smith & DiGregorio, 2002), such as the creation of new products, new services, new ventures, and so forth (Gartner, 1990; Schumpeter, 1934)."

While creativity is central to perception of opportunity (e.g., Ward, 2004), biases against creativity have recently been shown. Mueller, Melwani, and Goncalo (2012) suggest the potential for implicit biases against creativity based on the uncertainty aversion, while also acknowledging social pressures to express favorable attitudes about creativity (Flynn & Chatman, 2001; Runco, 2010). Indeed, this is what Mueller, Melwani, and Goncalo (2012) empirically find: while explicit attitudes toward creativity are positive, implicit negative biases

are shown based on uncertainty aversion. Other work by Mueller, Goncalo, and Kamdar (2011) has looked into social biases against creativity in an organizational setting. The authors find that expressing creative ideas undermines others' perceptions of a target's leadership potential, apparently through prototype models. Mueller and colleagues specifically note (2011: 494):

Research on prototypes of the creative individual underscores that social perceivers most often diagnose creative potential based on targets' expression of creative ideas in social contexts (Elsbach & Kramer, 2003). However, far from matching fundamental leadership expectations associated with exuding control and promoting clear goals, the expression of creative solutions may actually introduce ambiguity or uncertainty, in part, because by definition, novel ideas involve deviations from the status quo and are not yet proven (Amabile, 1996; Staw, 1995). Prototype theory confirms this view that the expression of creative ideas is often associated with uncertainty, nonconformity, unorthodoxy and unconventionality (Elsbach & Kramer, 2003; Sternberg, 1985)—traits which run contrary to deeply rooted expectations that prototypical leaders diminish uncertainty and provide normative order (Phillips & Lord, 1981).

Hence, the very things associated with nascent entrepreneurship (e.g., uncertainty, creativity, deviance from the status quo) present friction at both the individual and social level. At the social level, founder behavior influences perceptions of the founder on various attributes (e.g., the extent to which a founder is creative) (cf. Chen, Yao, & Kotha, 2009). Such perceptions stand to affect others' judgments of and interest in a founder and an opportunity pursuit. I will return to this near the end of this chapter, after reviewing the concept of disinhibition.

Basic Psychology of Disinhibition

Regarding the psychology of individual-opportunity nexus, “[entrepreneurship] researchers have analyzed a wide range of psychological factors, [and] they can be organized

into three broad categories: aspects of personality and motives, core self-evaluation, and cognitive characteristics” (Shane, 2003: 96). Recent organizational literature has been advanced based on these topics and others (e.g., Baron & Tang, 2011; Hmieleski & Baron, 2009), with individual cognition, motives, and behavior remaining relevant. However, questions remain as to the effect of psychological factors in would-be founders on the transition from individual pursuit to an organizational pursuit. Central to cognition, motives, and behavior is the concept of (dis)inhibition.

Based on literature subsequently discussed, I pose disinhibition as a relevant factor affecting entrepreneurial opportunity pursuit. The discussion is organized as follows. I first describe the general term disinhibition and its various usages in scientific literatures. Thereafter, I focus on motivational, cognitive, and behavioral disinhibition. As ADHD represents a particular type of disinhibition (e.g., Barkley, 1997), is well established in scientific literature (e.g., Barkley, Murphy & Fischer, 2008; Goldman et al., 1998; Kessler et al., 2005; 2007), and is germane to organizations and vocational behavior (e.g., Patton, 2009; de Graf et al., 2008; Biederman & Faraone, 2006), I ultimately focus on ADHD-type disinhibition. After discussing disinhibition, I then elaborate on the connection between disinhibition and entrepreneurship including hypotheses of the social psychological effect on others.

What is (dis)inhibition? The General Term/Concept

As a general term, inhibition simply refers to a restraint, suppression, attenuation, or blocking. The converse is disinhibition, a general term referring to a lack or loss of inhibition. Highlighting the general nature of the term, inhibition is defined in the Merriam-Webster dictionary as:

1. a. the act of inhibiting : the state of being inhibited,
b. something that forbids, debars, or restricts;
 2. an inner impediment to free activity, expression, or functioning : as
 - a. a mental process imposing restraint upon behavior or another mental process (as a desire),
 - b. a restraining of the function of a bodily organ or an agent (as an enzyme).
- (Merriam-Webster, 2013, <http://www.merriam-webster.com>, accessed 2/22/2013)

Scientific Usage of the Term and Illustrations

In scientific discourse the terms *inhibition* and *disinhibition* are often used side by side and in different ways according to the type of research. For example, (dis)inhibition can be used to describe neural activity, basic individual behavior, general social behavior, online behavior, sexual behavior, or other disorder-type behavior.

Scholars typically use the word *disinhibition* to convey a focus on one side of the (dis)inhibitory coin. Depending on the context, *disinhibition* can be used to convey a focus on unfettered appetitive impulse, the absence of inhibition, the removal of an inhibitor, or to position on a spectrum from *inhibited* to *neutral* to *disinhibited* (e.g., from *social inhibition* to *social disinhibition*).

To offer specific examples of usage of the term *disinhibition* in the psychological sciences, the following are scholarly paper titles: *Inhibition and disinhibition of pyramidal neurons by activation of nicotinic receptors on hippocampal interneurons* (Ji & Dani, 2000); *Inhibition and disinhibition of self-stimulation and feeding* (Hoebel, 1968); *Effects of alcohol priming on social disinhibition* (Freeman et al., 2010); *The online disinhibition effect* (Suler, 2004); *Sexual disinhibition in schizophrenia...* (Lam, Fong, & Wing, 2007); *Behavioral disinhibition: liability for externalizing spectrum disorders and its genetic and environmental relation to response inhibition across adolescence* (Young et al., 2009).

In sum, the term disinhibition is a versatile concept in the scientific literature. I now elaborate on types of (dis)inhibition relevant to the research at hand.

Cognitive, Motivational, and Behavioral (Dis)Inhibition

(Dis)inhibition is central to cognition, motivation, and behavior (Nigg, 2000). Inhibition in cognition and motivation underpin behavioral inhibition. Each is respectively discussed.

Cognitive (Dis)Inhibition. In relation to cognition, perceptual and latent inhibition restrict the stimuli reaching conscious awareness. Inhibiting awareness of irrelevant stimuli is important given limits on human processing capability. More specifically, this is important for protecting working memory and attention. Latent inhibition protects our thought process (and behavior) from being overwhelmed from a never-ending barrage of stimuli being received at every moment, such as the background sound of a bell or co-worker. Beyond sensory stimuli, inhibition of irrelevant thoughts is also important to adaptive cognition. For example, while trying to comprehend new information or to edit a manuscript, extraneous thoughts tax attention or may hijack attention completely. At the level of the neural networks underlying cognition, inhibition of spreading neural activity/arousal is necessary for focused linear thought (as opposed to more divergent associative thought).

Overall, cognitive inhibition is central to the (neo-cortical) *executive functions* and *executive functioning*. The *executive functions* are the basic cognitive abilities such as working memory and attention necessary for higher-order cognition and non-reflexive behavior (Miller & Cohen, 2001). *Executive functioning* refers to the overall executive performance of an individual. As an example, impairment in one executive *function* (e.g., working memory) typically impairs an individual's overall *executive functioning*. In the psychological literature, the term *executive* refers to the supervisory CEO-type role of directing, integrating, coordinating, and executing

various functions. Here, the metaphysical *executive* resides within the prefrontal cortex. The theoretical *executive* receives input from and orchestrates lower-order systems, integrates information, and deploys attentional and other resources.² The purpose of the executive is to ultimately assemble and execute adaptive organized behavior. Thus the *executive functions* of cognitive psychology and *executive functioning deficits* are highly germane to individual behavior. Disinhibition in lower-order cognitive systems (e.g., low latent inhibition) provides greater inputs for potential use by the *executive* yet at a potential cost to overall executive functioning.

Motivational (Dis)Inhibition. In relation to motivation, a somewhat similar situation exists. Individuals face a barrage of drives, with some needing to be inhibited in the service of others. As a very simple and broad example, individuals are motivated to both seek pleasure (appetitive motivation) and to avoid pain (aversive motivation). For adaptive functioning, it is important that appetitive drives are inhibited in service of pain avoidance. Concurrently, pain avoidance drives also need to be inhibited for adaptive functioning. This is because an uninhibited drive to avoid possible discomfort would radically restrict or eliminate adaptive gain-seeking behavior. In other words, behavior is motivated by both appetitive gain-seeking drives, and by aversive loss-avoidance drives. Considering myriad lower and higher-order motives simultaneously existing in an individual, motivational (dis)inhibition is central to driving complex behavior.

Two motivational systems underlying gain-seeking and loss-avoiding behavior are discussed in the next subsection. For the moment, the important point is the following. Relatively unfettered appetitive drive yields greater appetitive impulses. With limited underlying (sub-

² Note: such psychology, extending to the level of neuroscience, is of increasing interest to organizational research (e.g., see Becker, Cropanzano, & Sanfey, 2011; Senior, Lee, & Butler, 2011).

cortical) inhibition of drives, greater behavioral impulses are generated. Whether these impulses are expressed will depend on higher-order (e.g., executive) functioning. Overall, stronger impulses are more likely to be expressed and otherwise require more executive resources to inhibit.

Behavioral (Dis)Inhibition. Behavioral disinhibition refers broadly to unrestrained behavior, understood from cognitive and motivational origins (Nigg, 2000). From the cognitive perspective, behavioral disinhibition is a manifestation of reduced executive functioning; behavior is less restrained based on reduced cognitive inhibition and control (Nigg, 2000). This relative lack or deficit in executive inhibition means prepotent (cued, immediately reinforcing) behavioral impulses will be expressed, irrespective of their adaptiveness. For example, this may refer to attending to off-task stimuli, not withholding a prepotent behavioral response to an event, or continuing an in-progress activity that should be stopped. In other words, from the cognitive perspective, behavioral disinhibition refers to uninhibited internal behavior (e.g., mentally attending to off-task stimuli) and external behavior (e.g., failure to suppress prepotent motor behavior) (e.g., Barkley, 1997).

From the motivational perspective, behavior is driven by separable bottom-up (limbic-cortical) motivational systems, the Behavioral Activation System (BAS) and the Behavioral Inhibition System (BIS) (Carver & White, 1994; Gray, 1981; 1982; Corr, 2004; Nigg, 2000). The BAS reflects reward sensitivity and appetitive motivation. The BIS reflects punishment sensitivity and aversive motivation. Higher BIS sensitivity motivates loss-avoidance behavior; higher BAS sensitivity motivates gain-seeking behavior. From this perspective, behavioral inhibition refers to strong BIS; behavioral disinhibition refers to weak BIS (e.g., van den Bos et al., 2009), strong BAS (e.g., Patterson & Newman, 1993), or relative BAS to BIS strength (e.g.,

Nigg, 2000). In other words, relatively greater appetitive drives generate impulses for gain-seeking behavior. Behavior is unrestrained, owing to the relative imbalance in appetitive and aversive motivations.

The cognitive and motivational perspectives and underpinnings of behavioral disinhibition are complementary (Nigg, 2000). They are concerned with relatively unfettered behavior, placing greater emphasis on either cognitive executive functions or motivational drives underlying behavior. Interestingly, Attention Deficit/Hyperactivity Disorder (ADHD) offers a well-researched type of behavioral disinhibition (e.g., Barkley, 1997) and is grounded in executive functioning deficits and appetitive impulses (Nigg, 2000; Barkley, 1997). Further, it offers a particular and circumscribed type of behavioral disinhibition as is subsequently discussed.

ADHD Disinhibition

Attention Deficit/Hyperactivity Disorder (ADHD) represents a well-studied type of disinhibition (e.g., Barkley, 1997; Barkley, Murphy, & Fischer, 2008). ADHD disinhibition reflects weak executive functioning, and is defined as impulsive, hyperactive, and inattentive behavior (American Psychiatric Association, 2000; 2013; Barkley, 1997; Barkley, Murphy, & Fischer, 2008).

As a clinical construct, ADHD is defined as a pervasive and clinically significant level of the specified behavioral disinhibition (i.e., impulsive, hyperactive, inattentive behavior). This means that for a clinical diagnosis an individual must meet diagnostic criteria, which indicate that the impulsive, hyperactive, inattentive behavior is enduring and materially impairs individual functioning (APA, 2000; 2013). The defining symptomatic behavior can manifest in various ways. For example, in a classroom or office setting, hyperactivity may be expressed as

excessive moving about while presenting, an inability to remain seated when appropriate, and or other uninhibited motor behavior such as fidgeting (e.g., relentlessly tapping one's feet or a pencil). To be indicative of clinical ADHD, the defining behavioral symptoms must be material, pervasive, impairing, and not due to alternative conditions (e.g., schizophrenia).

In terms of validity and significance, “ADHD is one of the best-researched disorders in medicine, and the overall data on its validity are far more compelling than for many medical conditions (Cantwell, 1996; Hinshaw, 1987; Munoz-Millan & Casteel, 1989)” (Goldman et al., 1998: 1102). ADHD is recognized by the American Medical Association, the National Institutes of Health, and the World Health Organization (Goldman et al., 1998; Kessler et al., 2007). Furthermore, ADHD is not an obscure condition or limited to youth but rather, “ADHD is one of the most prevalent mental [conditions] among American adults” (Patton, 2009: 326; Kessler et al., 2005). The prevalence of clinical ADHD in the adult workforce is no small matter. It affects around 4.5% of US workers and 3.5% of workers across a ten country sample (de Graaf et. al., 2008). Yet most adults with clinical ADHD are unaware they have it (e.g., Nadeau, 2005).

With ADHD, like many other clinical constructs, individuals fall on a relatively continuous spectrum of indicators or symptoms (Kessler et al., 2005; 2007). For clinical purposes, individuals above a specified threshold are considered “cases.” Clinical psychology is typically concerned with clinical “cases” and “non-cases.” However other branches of psychology and organizational research have fruitfully leveraged initially clinical constructs.³ In relation to ADHD, without bifurcating *cases* and *non-cases*, Verheul and colleagues (2012) find that greater levels of ADHD (i.e., ADHD indicators/symptomatic behavior) are associated with

³ Other examples of initially clinical and continuous constructs include narcissism and psychopathy. In relation to organizational research, Chatterji and Hambrick (2007) for example, find that greater levels of narcissism are associated with organizational strategy and outcomes, without concern for whether subjects meet clinical diagnostic criteria for narcissistic personality disorder. Similarly, non-clinical psychopathy has been linked to entrepreneurship (Akhtar, Ahmetoglu, & Chamorro-Premuzic, 2013).

increased entrepreneurial intentions. The essential point is that in discussing ADHD disinhibition, I am not referring to explicitly diagnosed cases; nor am I necessarily referring to a level of disinhibition that would qualify for a clinical diagnosis. Rather, ADHD disinhibition represents a relatively continuous spectrum of hyperactivity, impulsivity, and inattention/distractibility, with individuals distributed across the spectrum (Kessler et al., 2005). Thus, my argument is not contingent on a “yes/no” clinical diagnosis or on which side of a clinical cut-point a particular individual would fall. My argument is also independent of popular press discussion about the diagnosis and treatment of clinical ADHD cases (e.g., the possibility of over-diagnosis or the entirely pathological focus of conventional clinical psychology/psychiatry). Rather, ADHD behavior is an exemplar of disinhibition; akin to Verheul and colleagues (2012), my general thesis considers the general effect of ADHD-type disinhibition.

In terms of the effects of ADHD disinhibition, the psychology literature has shown serious deficits in individual persistence, follow-through on intrinsically uninteresting tasks, and rule governed behavior (e.g., Barkley, 1989; Barkley, Murphy & Fischer, 2008), and the importance of supporting mechanisms. Support can focus on environmental manipulation (e.g., a distraction minimized workspace), exogenous support (e.g., administrative or secretarial assistance), developing compensatory internal procedures (e.g., use of routines, checklists, electronic reminders), and any combination thereof.

At a social level, in a non-entrepreneurial context, behavioral displays of ADHD disinhibition can present a social liability. Such displays reduce others’ interest to interact with a target and liking of a target (Canu & Carlson, 2003; Paulson et al., 2005). Also the suggestion that an individual has ADHD is a liability on others’ judgments about the target; the liability is

not just relative to a normal control, but also relative to having an adverse physical condition or an ambiguous weakness (Canu et al., 2008). ADHD is also associated with negative attitudes and judgments of an individual target (Chew, Jensen, & Rosen, 2009).

There have, however, been suggestions in scientific literature (White & Shah 2006; 2011) and in other press (e.g., Hartman, 1997; 2002; Palladino, 2010; Weiss, 1999) of a positive connection between ADHD and creativity, creative achievement, and other productive potential. For example, White and Shah (2006) find a positive relationship between ADHD and creative ideation. More recently, White and Shah (2011) uncovered a positive connection between ADHD and creative achievement (i.e., life accomplishments in creative activities). The general premise of this and most non-scholarly press (including books by clinical psychologists and psychiatrist practitioners) is that the inhibitory weakness of ADHD facilitates unrestrained perception and action. While this may be a liability for in-the-box activity and environments, less fettered thought and action can be an asset for creative pursuits and overcoming inertia.

Regarding the connection to entrepreneurship, Hayek and Harvey (2012: 6) propose ADHD as “an entrepreneurial marker,” drawing parallels between the cognitive and behavioral aspects of ADHD and entrepreneurial cognition and action. Also, as previously noted, Verheul and colleagues (2012) found ADHD level positively predictive of entrepreneurial intentions (i.e., whether an individual intends to become an entrepreneur). Other studies, looking at entrepreneurs or the vocational outcomes of clinical ADHD individuals, have also shown links to entrepreneurship. For example, Levander and Raccuia (2001) found entrepreneurs were substantially higher in ADHD, relative to what would be expected from ADHD base rates as well as relative to a comparison group of non-entrepreneurs. Mannuzza and colleagues (1993)

found ADHD individuals with clinical diagnoses were approximately four times more likely to be entrepreneurs than non-clinical individuals.

Beyond the scientific literature, a positive connection between ADHD and entrepreneurship is often suggested by practicing clinicians (e.g., Hallowell & Ratey, 2005; 2011; Pallidino, 2010) and others based on logical augmentation and various cases (e.g., Hartmann, 2010). There are also an increasing number of high-profile cases of ADHD entrepreneurs, such as the founders of Virgin, Kinkos, and JetBlue (Branson, 2002; Hantula, 2006; Orfalea & Marsh, 2005; Wynbrandt, 2004). Popular suggestions of the ADHD-entrepreneur connection are not limited to celebrity cases. For example, as Tice (2010) writes for Entrepreneur magazine:

Seasoned venture capitalist Jeffrey Bussgang of Flybridge Capital, who's authored a new book on getting VC, says, "There's a super-high correlation between ADD and entrepreneurs. I think it's because great entrepreneurs are impatient. When things are stable, they get bored. They're always looking to shake things up, because they need that stimulation and change."

Atlanta-based professional interim chief financial officer Evan Rogoff, who's worked with dozens of startups through the years, chimes in, "Most entrepreneurs have ADD. Really -- there's a significant number of successful entrepreneurs with undiagnosed ADD."

Bussgang and Rogoff agree that while ADD might be considered a handicap as a worker bee, entrepreneurs' ADD turns out to be a positive in the small-business world.

A commonality between the scientific and popular literature is the relevance of task, environment, and support related to ADHD. Both literatures suggest the importance of individuals high in ADHD disinhibition selecting into dynamic environments, focusing on non-

routine stimulating tasks, and using interventions to mitigate the short-comings (Hartman, 2002; Nadeau, 2005; Orfalea & Marsh, 2005; Painter, Prevatt, & Welles, 2008). Examples of the latter include having the support of assistants or complementary others to follow through on details and balance impulse-driven behavior.

Summary

Disinhibition, specifically ADHD disinhibition, is an individual psychological factor relevant to behavior. With greater levels of ADHD disinhibition, individual behavior is more hyperactive, impulsive, and distractible. Underlying the observable behavior, cognitive and motivational disinhibition tax executive functioning. Executive functioning impairment unfetters thought and behavior. This means prepotent cognition, motives, and behavior are increasingly expressed. Unfettered thought and behavior risk distracting the individual or otherwise interfering with adaptive individual or social behavior. Concurrently, unfettered cognition, appetitive drive, and behavior may explain popular suggestions of associations with creativity and entrepreneurs. Unfettered cognition and behavior also fit scholarly models of creativity, which indicate cognitive and behavioral variation as creativity antecedents (e.g., Amabile et. al., 2006). Given executive functioning weakness, with greater ADHD disinhibition it is increasingly important that such individuals work with complementary others. However, general psychological literature has found ADHD disinhibition presents a social liability on interest to interact with and judgments of an ADHD target (e.g., Canu et al., 2008; Chew, Jensen, & Rosen, 2009; Paulson et al., 2005). Hence, biases against the individual with ADHD may make it more challenging for such an individual to obtain the support needed. Thus the lingering question is, in an entrepreneurial context what effect does disinhibition have on others? Before hypothesizing

about this question, I speak further to the general nascent entrepreneurship-disinhibition connection.

Entrepreneurial Pursuit and Disinhibition

Cognition and motivation play a central role in entrepreneurial action and outcomes (Baron, 2004; Brockner, Higgins, & Low, 2004; McMullen & Shepherd, 2006; Mitchell, Busenitz, Bird, Gaglio, McMullen, Morse, & Smith, 2007; Shane, 2003). In relation to cognition, entrepreneurial ideas are the seeds of potential entrepreneurial action. As novelty is involved in entrepreneurship, entrepreneurial ideas are uncertain (e.g., McMullen & Shepherd, 2006) and beyond the established convention. In relation to entrepreneurial ideas, relatively weaker executive (cognitive) suppression of tangential ideation and stimuli provide greater recombinatory inputs for potential creative synthesis. Breaks in attention or distractions (e.g., failures in sustained attention) can also increase creative insights (George, 2007). This does not mean that a level of constraint or cognitive inhibition is not important to the screening of ideas and any following exploitation/performance; it simply implies that cognitive disinhibition and apparently inattentive behavior can facilitate entrepreneurial ideation.

In relation to motivation, a connected story exists. Regulatory focus theory suggests that individuals are driven by promotional aspirations (appetitive motivation toward gains/ideal-self) and prevention desires (aversive motivation for avoiding loss/failure of ought-self) (Higgins, 1988). Applying Regulatory Focus theory to entrepreneurial behavior, a promotion focus drives attention to potential opportunities and motivates pursuing opportunities. A prevention focus (on avoiding failures) facilitates perception of potential threats and motivates pursuit aversion. A strong promotion focus impels opportunity recognition and initial action on such entrepreneurial ideas (Tumasjan & Braun, 2012). Prevention focus is, however, important in idea evaluation,

selection among alternatives, and loss-avoidance aspects of opportunity exploitation (Brockner, Higgins, & Low, 2004). In other words, appetitive motivation impels initiating action. After the entrepreneurial idea and willingness are generated, and action is set into motion, aversive motivation is important to prudently screen possibilities and administer any exploitation. While eventual venture performance and survival necessitates a balance of motivations, relatively imbalanced appetitive drive facilitates greater exploration of entrepreneurial pursuits (cf. Tumasjan & Braun, 2012).

All else equal, the more uninhibited an actor, the greater the likelihood and size of any deviation from conventional perception and action. With greater disinhibition, an individual's limited attention is increasingly directed to potential rewards and less devoted to threat-avoidance and established convention (e.g., Barkley, 1989; Barkley, Murphy, & Fischer, 2008). This logically increases the more disinhibited actor's potential for novel cognition and behavior. With elevated levels of disinhibition, an actor increasingly struggles and fails to maintain a narrow focus, yet in the process may synthesize or stumble upon alternative possibilities.

Related to this, lower latent inhibition has been positively linked with creative achievement (Carson, Petersons, & Higgins, 2006), suggesting the positive potential of cognitive disinhibition. Simonton (2003: 488) notes that accumulated research "suggests that the creative process is far less logical and deterministic than is often claimed." In fact, creative discovery according to Simonton (2003: 475) can be "accurately modeled as a quasi-random combinatorial process." In line with other models of creativity (e.g., Amabile et. al., 2006), the point is that more cognitive and behavioral variation enhance the likelihood of novel discovery or creation. Furthermore, Simonton (2003) was speaking about the creative process leading to scientific discovery, which is constrained absolutely by the laws of natural science. Thus, the potential of

quasi-random combinatorial thought and action for entrepreneurial discovery and creation is at least as great, since entrepreneurship is a social artifact not constrained by natural laws (cf. Sarasvarthy, 2003).

In relation to entrepreneurship, I am not asserting that greater creativity or greater disinhibition leads to superior venture performance or other venture outcomes. I am also not asserting that all founders are high in disinhibition. Rather, I simply speak to the logical basis for disinhibition facilitating initiation of entrepreneurial opportunity pursuit. Unrestrained cognition and motivation underlie behavioral inattention (breaks in selective narrow attention), impulsivity, and hyperactivity. These define ADHD disinhibition, and increase the potential for nascent entrepreneurial action. Besides the previously cited scholarly and popular works directly or indirectly suggestive of this connection, further evidence of the connection has recently been suggested. Lerner (2010; 2011; 2012) and Lerner and Hunt (2012) found a significant linkage between underlying disinhibition and initial individual entrepreneurial action. This however leaves the question of the effect of would-be founder disinhibition on the social sphere.

To advance from individual nascent entrepreneurial behavior to a nascent start-up firm, other individuals beyond the founder are needed. This implies that others' perceptions and judgments of a would-be founder matter. The would-be founder needs other individuals to change their bystander behavior and contribute to the pursuit; yet the would-be founder lacks both fiat and the resources of an established organization. Thus, others are in the position to judge the would-be founder and whether to invest their time and resources. At the most nascent stage, others have very limited information upon which to make their judgments. Particularly when individuals lack evidence of more objective factors on which to evaluate a target, a target's

personal attributes influence the decision making of others, with “inferences drawn from a person’s appearance, communication and conduct (Goffman, 1959)” (Clark, 2008: 206).

In sum, at the initial nexus between a would-be founder and other individuals, the information others have is typically limited to what the would-be founder says and does, often from a brief presentation and potentially a few moments of questioning. Signals of disinhibition in a would-be founder could have both positive and negative effects on others’ evaluations of the would-be founder, the venture, and any interest in joining the pursuit. Considering popular conceptions of entrepreneurs possessing ADHD characteristics, in an entrepreneurial context ADHD disinhibition could be considered more neutral or ambiguous. Thus unlike the results of non-entrepreneurial studies that found ADHD disinhibition in a target adversely affected others’ interest to interact (Paulson et al., 2005; Canu et al., 2008), here it may not present that liability. Stated as a formal hypothesis:

Hypothesis 1: In an entrepreneurial context, ADHD disinhibition presented by a would-be founder is not a liability on others’ interest in general social interaction (with the would-be founder).

In terms of evaluations of a target, ADHD disinhibition should positively align with creative types and negatively align with administrative types. Whereas suggestions of hyperactivity, impulsivity, and attentional variability would seem to fit with conceptions of more artistic, innovative, creative types (i.e., those who explore and *generate* new things), the same defining characteristics also seem contra-indicators of administrator types (i.e., those who structure and administer action for exploiting new or existing things). This does not suggest that a particular individual cannot have both generative qualities and administrative qualities. Simply, I hypothesize that:

Hypothesis 2: ADHD disinhibition presented by a would-be founder

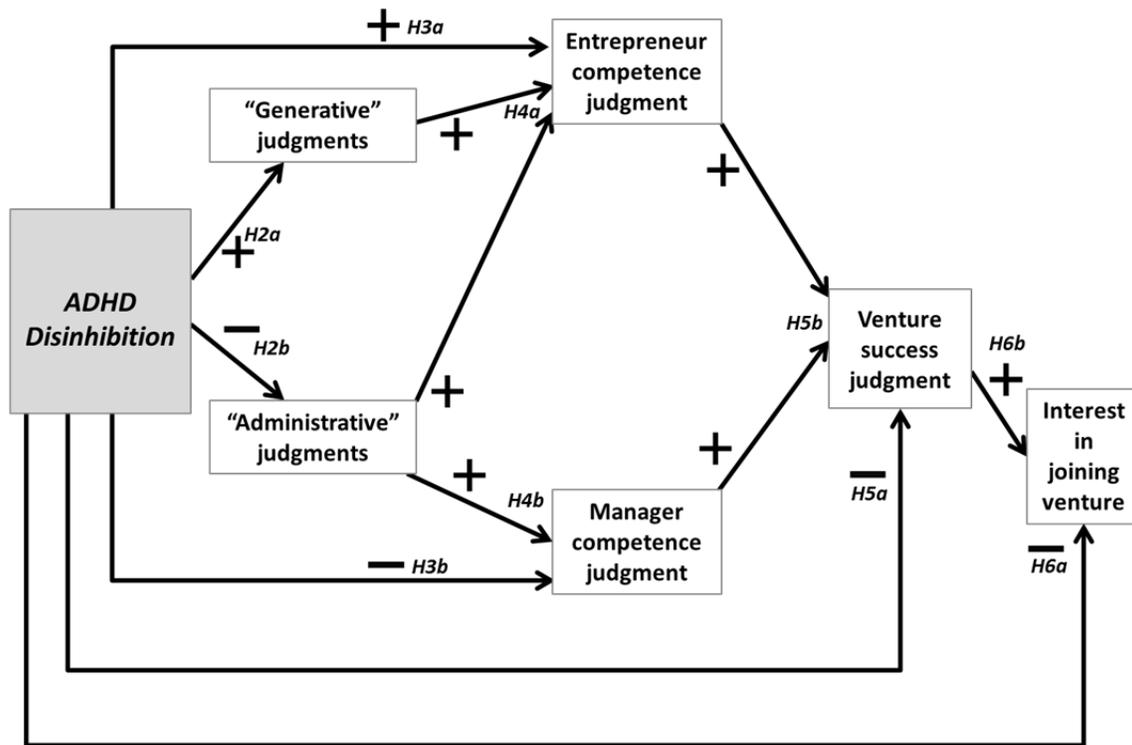
- a. is positively associated with others' judgments of (the founder's) "generative" attributes: being creative, visionary, good at idea generation, and good at recognizing opportunities.*
- b. is negatively associated with others' judgments of (the founder's) "administrative" attributes: being reliable, consistent, good at planning next-steps, and good at implementing.*

In relation to further judgments, the extent to which the would-be founder is perceived to be intelligent, trustworthy, or hardworking should be relatively independent of ADHD disinhibition. The characteristics of ADHD indicate executive functioning weakness, not a lack of intellect, integrity, or willingness to work. As these are relatively independent of generative and administrative qualities, in an entrepreneurial context I posit that ADHD disinhibition in a target will not affect these other judgments. While this hypothesis is not central to the overall argument of this dissertation, it offers a further test, and can be compared with the negative findings of Chew, Jensen, and Rosen (2009). As Hypothesis 2c:

- c. ADHD disinhibition presented by a would-be founder is neither positively nor negatively associated with observers' Other judgments of the would-be founder (i.e., intelligent, trustworthy, and hardworking).*

Figure 1 displays the general model, simultaneously illustrating the hypothesized main effects and the shorter mediated pathways. The social psychological effect of ADHD disinhibition in a target on other individuals is shown. With the exception of the shaded box (representing the would-be founder), the boxes refer to others' evaluations. Hypotheses 1 and 2c are not shown in the model for simplicity.

Figure 1: Hypothesized Model (Main and Indirect Effects)



Based on popular conceptions of entrepreneurs possessing more ADHD and the hypothesized connections to “generative” capacities and attributes, ADHD disinhibition in a target should be positively related to assessments of the target’s competence as an entrepreneur *relative* to other positions. Concurrently, ADHD disinhibition in a would-be founder should be negatively related to others’ assessments of the would-be founder’s managerial competence based on the negative connection to administrative qualities. Finally, as administrative qualities are ultimately important to implementing and exploiting entrepreneurial ideas, there should also be a positive relationship between perceptions of administrative qualities and competence as an entrepreneur. Stated as both main effect and mediated hypotheses:

Hypothesis 3: ADHD disinhibition presented by a would-be founder

- a. is positively related to others' perceptions of competence as an entrepreneur over other work positions.*
- b. is negatively related to others' perceptions of competence as a manager.*

Hypothesis 4: Individuals' perceptions of a would-be founder's entrepreneurial and managerial competence are mediated as follows:

- a. perceptions of entrepreneurial competence are positively mediated by both generative and administrative judgments.*
- b. perceptions of managerial competence are positively mediated by administrative judgments.*

Based on the hypothesized negative effect of ADHD disinhibition on others' judgments of managerial competence, and considering the importance of both entrepreneurial and managerial competence for ultimate venture successes, I posit ADHD disinhibition in a would-be founder undermines (reduces) others' judgments of the probability of venture success. Again, as main effect and mediated hypotheses:

Hypothesis 5: ADHD disinhibition in a would-be founder

- a. undermines (reduces) others' judgments of the probability of venture success.*
- b. This negative association is mediated by others' perceptions of both entrepreneurial and managerial competence.*

Finally, considering the risks of investing one's time and career in working with an more unfettered founder or for an unsuccessful venture, ADHD disinhibition in a target founder may undermine (reduce) interest in joining the target's venture. Specified as main effect and mediated hypotheses:

Hypothesis 6: ADHD disinhibition in a would-be founder

- a. undermines (reduces) others' interest in joining the opportunity pursuit/venture.*
- b. This negative association is partially mediated by others' perceived likelihood of venture success.*

Chapter 3

Method

This chapter describes the empirical research design. It is organized as follows. The first section provides a high-level overview of the research procedure. Then, the motivation for the experimental design is discussed, and the experimental factors are summarized. Thereafter the experimental stimuli are discussed, including the manipulation of the ADHD disinhibition (independent variable). This is followed by explanation of the dependent variables. After this, the research sample is discussed. The chapter concludes with a short discussion summarizing pilot testing of the research instrument, data checking, and a sensitivity (power) analysis.

High-level Overview of Research Procedure

The procedure was modeled after past research using experimental designs where subjects evaluated apparent entrepreneurs (e.g., Baron, Markman, & Bollinger, 2006) and entrepreneurial pursuit ideas (e.g., Gregoire & Shepherd, 2012). In particular, participants received and evaluated two different would-be founders and their associated pursuits (i.e., the study stimuli). This was done with an electronic instrument, organized in the sequence listed below. Subsequent subsections provide further details.

1. *Cover page*: An explanation of the context and task.
2. *Study Stimuli 1 (Condition 1)*: A written description of the first would-be founder (randomized between the two ADHD disinhibition conditions), and the associated entrepreneurial idea/pursuit (randomized between the two pursuits).
3. *Data Collection Part 1*: Questions where subjects evaluated the first would-be founder, entrepreneurial pursuit, and their interest in joining it.
4. *Study Stimuli 2 (Condition 2)*: The written description of the second would-be founder (counter-balanced), and the second associated (counter-balanced) entrepreneurial pursuit.

5. *Data Collection Part 2*: Questions (equivalent to the prior ones) where subjects evaluated the second would-be founder, entrepreneurial pursuit, and their interest in joining it.
6. *Data Collection Part 3*: Questions where subjects evaluated side by side the two different entrepreneurial ideas, founders, and ventures.
7. *Data Collection Part 4*: Questions where subjects provided demographic and other information.

Motivation for Controlled Experiment, and Factorial Design Summary

A number of factors guided the consideration of possible research designs. As discussed in the previous chapter, research involving highly nascent stage phenomena is particularly subject to winners' bias, since it is the initially successful actors who become and remain visible. Thus, designs based on actual founders would start with winners and would not be appropriate given the possibility of ADHD disinhibition impairing advancement to founder status. Also, myriad confounding factors would be present in a field study (e.g., endogeneity and omitted variable problems related to differences in the would-be entrepreneurs). Furthermore, the aforementioned problems are not unique to quantitative designs but would also be present in qualitative field studies.

Considering these factors and the trade-offs of various designs, a controlled experimental design was chosen. The design serves as a basis for future research and theory building by offering a controlled setting for testing and establishing the hypothesized effects. When using an experimental design with random assignment, "although there are still unmeasured variables, there is no longer an unmeasured variables problem (James, 1980). For this reason, random assignment has been termed 'the great ceteris paribus' of causal inference (Cook & Campell, 1979: 5). Moreover, the fact that the experimenter controls [the] independent variable, rules out the possibility that the outcome actually caused the predictor in a given study" (Colquitt 2008:

616). In further support of randomized experimental designs, Chatman and Flynn (2005: 437) note:

A critical advantage of experimental design is that it enables researchers to identify causal relationships and rule out alternative explanations.

[In regards to generalizability] the underlying links among constructs likely apply to other people (because of randomization) in other contexts (because of the artificiality of the laboratory context). [The] increased control of manipulation-based research helps to uncover general relationships rather than idiosyncratic ones resulting from ‘noisy’ or unmeasured factors present in the field. Thus, experimental research helps to build theory by making more elegant, parsimonious predictions.

Of possible experimental designs, a within-subjects design was desirable as it would provide a direct causal test of the effect of ADHD disinhibition in a would-be founder on other individuals’ judgments. The effect of would-be founder disinhibition on an individual’s judgments could be observed from the subject’s ratings of potential would-be founders who varied only on ADHD disinhibition. However because a subject rates more than one would-be founder and associated venture, a single within-subjects factor manipulating only founder disinhibition would not suffice. Two other factors of *order* and of venture *pursuit/idea* would be prudent. While there is no reason to believe there would be an effect of order (i.e., which founder is presented and evaluated first), order is a factor to be counterbalanced and examined for a possible effect. Also, with individuals being presented and rating two different would-be founders, for realism it would be important to have at least slightly different associated venture pursuits/ideas. This is because two different would-be founders, side by side, pursuing the exact same venture would be unusual and could be perceived as unrealistic.

Based on these considerations the experimental design was a 2 x 2 x 2 mixed factorial, with subjects evaluating two different would-be founders and associated pursuits. Following established experimental protocol, assignment to each condition was randomized and counterbalanced. The factors were the following: 2 levels of ADHD disinhibition in the would-be founder (within-subjects) x 2 different entrepreneurial pursuit ideas (within-subjects) x 2 orders of presentation (between-subjects).

The first factor was the independent variable of interest. The two levels of ADHD disinhibition are abbreviated herein as *ADHD+* and *ADHD-*. These reflect the indication (or contra-indication) of ADHD disinhibition in the would-be founder. This factor is described in detail in subsequent subsections.

The two other factors were prudent for proper experimental design. Two different entrepreneurial ideas were used for realism. This factor was crossed with the independent variable so any idea effect can be parceled out. The entrepreneurial ideas presented were real ideas based on commercialized products, and followed prior research. One of the entrepreneurial ideas presented was that used by Mueller and colleagues (2012) of a high-performance *running shoe* based on nanotechnology. The other idea was for a high-performance *jacket* using nanotechnology. The two different venture ideas were relatively similar (i.e., wearable consumer products incorporating nanotechnology) to limit any idea effect. While the randomized counterbalanced design allows parceling out of any such effect, minimizing the difference between ideas was desirable to limit variance unrelated to the research hypotheses.

For experimental control, the order of presentation was randomized and counterbalanced. This means that approximately half of the subjects received and evaluated the *ADHD+* target

(and randomized venture idea) first. While unrelated to the research hypotheses, this was necessary to be able to test for an order effect.

Overall, the design fits with calls for laboratory research in our field (Colquitt, 2008). Similarly, the experimental design fits with calls for research where controlled experiments contribute to larger research agendas (Chatman & Flynn, 2005).

Presentation of Experimental Stimuli: Rationale for Written Descriptions

As overviewed at the beginning of this chapter, the research stimuli were provided to subjects in a written format. This was based on various considerations, and consistent with extensive research where subjects are presented written descriptions for evaluating and making judgments or hypothetical choices, in the (artificial) research setting (e.g., Baron et al., 2006; Gregoire & Shepherd, 2012; Kahneman & Tversky, 1979).

In the organizational literature, experimental manipulations of ADHD disinhibition are lacking. In the psychology literature, manipulations of ADHD disinhibition have been presented in written and video format. For example, Canu et al. (2008) present written descriptions of target individuals, manipulating whether a target is described to have ADHD or another apparent weakness. Alternatively, Paulson et al. (2005) use a video with a trained actor, displaying the established ADHD criteria of hyperactivity, impulsivity, and inattention (APA, 2000).

Attempting to manipulate ADHD disinhibition in the would-be entrepreneur through visual (versus described) behavior was considered. This might have been attempted by using videos with differences in actors' motor activity (e.g., hyperactive fidgeting such as foot or pencil tapping) and attentional breaks (for inattention). However in the entrepreneurial evaluative context, using a video could interject potential confounds related to the follow-on judgments (e.g., if fidgeting was interpreted as a lack of confidence in the business concept).

Additionally, using video stimuli would interject other confounds (or further complicate the design with a fourth factor/dimension) since two different actors would be needed; this is because the same actor could not be believed to be the two different would-be founders. However if two different actors were used, it would be uncertain as to if any apparent effect of the independent variables was actually because of the ADHD disinhibition difference or other differences between the two individuals (e.g., physical attractiveness, mannerisms, voice, etc.). Finally, unlike other modes of presentation, providing the research stimuli in a written form would allow inclusion of the actual stimuli in this document and allow future research to use the identical manipulation.

So, for control and other reasons it was deemed prudent to use written stimuli, consistent with other experiments in entrepreneurial research (e.g., Baron et al., 2006; Fay & Williams 1993; Gregoire & Shepherd, 2012; Gregoire, Shepherd, & Lampert 2010; Sexton & Bowman-Upton, 1990). Written stimuli allowed crafting a manipulation more realistic to a nascent entrepreneurial context than using explicit stereotyping labels (e.g., “he is hyperactive”) or more ambiguous visual stimuli. Described in the next section, the written descriptions presented a target based on what could have been observed from watching a target present and briefly talking with him.

The Written Descriptions: Independent Variable Manipulation and Other Information Presented

Overview

For realism and to mask the explicit research question from subjects, the descriptions of the would-be founders were crafted to present the information composing the ADHD disinhibition manipulation interspersed with other details. In terms of the manipulation, the

would-be founder was not explicitly characterized with the words hyperactive, impulsive, and inattentive. Rather, in the descriptions of the would-be founders, each component was positively suggested (for the ADHD+ target) or contra-indicated (for the ADHD- target).

Balancing Experimental Manipulation and Realism

Manipulating ADHD disinhibition in the target would-be founder, while simultaneously maintaining ecological realism, was challenging. Here, ecological realism refers to representing what could reasonably be expected and observed in a highly nascent entrepreneurial context between a would-be founder and other individuals. For example, a would-be founder might briefly present his entrepreneurial pursuit to others in a one-on-one setting (e.g., to a classmate or coworker), in a small group setting (e.g., to class of entrepreneurship students), or at an organized pitch event (e.g., where aspiring founders have 1-minute to present their pursuit to an audience). In all cases, individuals have relatively limited information about the would-be founder upon which to make judgments – including whether one is interested in investing time to find out more about the would-be founder and his pursuit.

In the case the would-be founder is initially successful in engaging others' interest, *thereafter* others could gather further information about the target such as a resume, references, or a business plan (Clark, 2008). Yet at the point of initial contact, others typically lack such information. Particularly when individuals lack evidence of the more tangible and objective human capital factors of a would-be founder, more subjective human factors such as personal attributes influence the decision making of resource holding others, with “inferences drawn from a person’s appearance, communication and conduct (Goffman, 1959)” (Clark 2008: 206). In sum, at the initial nexus between a would-be founder and other individuals, the information

others have is limited to what the would-be founder says and does, typically from a brief presentation and potentially a few moments of questioning.

In terms of the experimental manipulation, the established indicators of ADHD disinhibition were manipulated based on more innocuous descriptions of the target. This was to avoid use of the three explicit indicating terms and the ADHD label which would be less realistic in a nascent entrepreneurial setting. For example, it would be unrealistic that entrepreneurs interested in attracting others would self-declare being inattentive, impulsive, hyperactive, or ADHD. Also, explicitly describing a target entrepreneur as “*inattentive, impulsive, and hyperactive*” was considered questionable. The three descriptors, especially in concert, are unlikely to be used naturally in describing an entrepreneur and seemed overly pathological. Thus the target was described to suggest the three factors in a more subtle and not overtly pathological way.

In terms of the validity of the manipulation, cues of ADHD behavioral disinhibition are realistically observable. For example, would-be founders with high levels of ADHD disinhibition would manifest greater motor activity (e.g., moving considerably while presenting, never standing still), pick-up on off-task environmental stimuli (e.g., an audience member’s Hawaiian shirt) and show associated signs of distraction or off-task comments, and be more impulsive in responses to questions. These are based on the defining characteristics of ADHD disinhibition itself. Conversely, would-be founders with low or lacking levels of ADHD disinhibition would not appear impulsive but seem to act according to plan. They would show relatively stable attention (i.e., not show the executive functioning deficits of distractibility or preservation/hyper-focus). Finally, they would not appear overly active. Concurrent with explicit behavioral

displays, indications or contra-indications of ADHD disinhibition could be present in the information presented by the would-be founder and in personal statements.

Based on these considerations, the manipulation was designed around innocuous descriptions reflecting ADHD disinhibition. The statements and overall descriptions of the would-be founders were tested and refined to ensure a relatively balanced depiction of both targets and realism. The testing and refinement was done with research faculty, doctoral students, entrepreneurship practitioners, undergraduate business students, and working professionals. The manipulation was interspersed throughout the text, with other information that was effectively equivalent across the conditions. Statements from the would-be founder (i.e., quotes) supporting the ADHD+/- conditions were included. This was based on guidance to provide subjects with richer descriptions, balancing realism with more narrow manipulation. The quote for the ADHD+ condition was from ADHD+ founder Paul Orfalea. The quote for the ADHD- condition suggested contra-indicators, a steady-pace (opposed to hyperactivity) and acting on specified criteria (opposed to more impulsive action). These quotes are provided in Table 1 below.

The basis for the validity of the manipulation is grounded in the psychology literature with ADHD disinhibition indicated by hyperactivity, impulsivity, and inattention/distractibility. However, for the manipulation to be considered valid, it must do more than align with the established three components. It must also impact (manipulate) perceptions of the described individual. In other words, whether the differential ADHD+/- stimuli were an effective manipulation depends on whether the relatively innocuous statements (based on the three indicators of ADHD disinhibition) actually lead individuals to evaluate the “+” target as more impulsive, inattentive, and (hyper)active. Accordingly a manipulation check was included and is later discussed.

Other Information and Adjustments in the Descriptions/Stimuli

Including additional information in the descriptions (unrelated to the manipulation) was deemed important to enhance realism and to keep the manipulation subtle by embedding it within a larger amount of information. The extra material included were details that added to the richness of the research stimuli, and that might be shared by a would-be founder or otherwise observed by others.

Subtle adjustments were made to the written stimuli so that the two descriptions did not appear identical except for the manipulation. For example, in all conditions the first two sentences provided the name and age of the would-be founder, and that he had a bachelor's degree and work experience in an industry related to his entrepreneurial pursuit. However, so that the two descriptions did not sound identical within-subjects, in one description the target's name followed by age was provided in the first sentence, with education and work experience in the second sentence; in the other description, the first sentence provided the other target's name then education then age, followed by work experience alone in the second sentence. While such details are mundane, the subtle adjustments to the passages helped ensure that the content of the passages was effectively equivalent except for the manipulation, without the manipulation being overly overt to subjects.

Wording adjustments were also used so that the passages did not appear identical other than the manipulation. In one description a subject read that the would-be founder "seems knowledgeable and is well spoken," while in the other description the would-be founder "speaks well and appears knowledgeable." The effective equivalence of all information not related to the focal independent variable was important for experimental control. Concurrently, the

equivalence was masked from subjects by interspersing the various descriptions throughout the overall passages, and by the temporal separation in presentation of the two passages.

Table 1 provides the focal study stimuli, the descriptions of the would-be founders. The key differences composing the manipulation, as well as the miscellaneous other information similar between the two conditions, are excerpted in Table 2.

Table 1: Descriptions of Would-be Founders (Focal Stimuli)

Description: ADHD+ disinhibition target (ADHD+ condition)
<i>Andrew is 35 years old. He has a bachelor’s degree and prior work experience in Sports & Athletic Equipment [when associated with the shoe idea]⁴. Observing him give a presentation and in talking with him, he is a high energy person, never sitting still. He seems knowledgeable and is well spoken. He appears to make decisions quickly somewhat on impulse. He seems to pick-up on things around him, which may distract him if needing to sustain a narrow focus. He comes across as self-confident. He mentions, “Too many business people attempt to manage by spreadsheet alone. I think you’ve got to be out in the world, looking for new opportunities to exploit. The world doesn’t stand still. Why would you?”</i>
Description: ADHD- disinhibition target (ADHD- condition)
<i>Thomas has a bachelor’s degree and is 34 years old. His prior work experience is in the Outdoor Gear Industry [when associated with the jacket idea]. Observing him give a presentation and in talking with him, he appears to plan before acting. He speaks well and appears knowledgeable. He seems consistent in his attention, not appearing easily distracted or hyper-focused. He appears self-assured. He notes, “Some people say business moves faster every day. Nonetheless, I believe in a steady pace according to specified criteria.”</i>

⁴ As described elsewhere, the structure and content of first two sentences of both conditions were counterbalanced between subjects.

Table 2: Key Differences (Manipulation) and Similarities between Stimuli

Manipulation	Indicators in ADHD+ target	Contra-indicators in ADHD- target
Differences	<ul style="list-style-type: none"> • <i>He appears to make decisions quickly somewhat on impulse.</i> • <i>He seems to pick-up on things around him, which may distract him if needing to sustain a narrow focus.</i> • <i>He is a high energy person, never sitting still.</i> • <i>He mentions, “Too many business people attempt to manage by spreadsheet alone. I think you’ve got to be out in the world, looking for new opportunities to exploit. The world doesn’t stand still. Why would you?”</i> 	<ul style="list-style-type: none"> • <i>He appears to plan before acting.</i> • <i>He seems consistent in his attention, not appearing easily distracted or hyper-focused.</i> • <i>He notes, “Some people say business moves faster every day. Nonetheless, I believe in a steady pace according to specified criteria.”</i>
<i>Equivalent information across conditions:</i>		
Other (Similar) Attributes:	<ul style="list-style-type: none"> • <i>Bachelor’s degree</i> • <i>Age: mid-thirties</i> • <i>Work-experience in industry related to idea/pursuit</i> • <i>Knowledgeable</i> • <i>Self-confident</i> • <i>Well spoken</i> 	<ul style="list-style-type: none"> • <i>Bachelor’s degree</i> • <i>Age: mid-thirties</i> • <i>Work-experience in industry related to idea/pursuit</i> • <i>Knowledgeable</i> • <i>Self-assured</i> • <i>Speaks well</i>

Manipulation Check

In order to assess whether the experimental manipulation was effective in inducing perceptions of ADHD disinhibition, a manipulation check was included. Before arriving at the manipulation check, subjects: 1) read the description of the target, 2) responded to questions evaluating the entrepreneurial idea, 3) responded to questions evaluating various competencies of the target, and 4) responded to an open-ended question about the target’s relevant strengths and weaknesses. This sequence was to ensure that the manipulation check itself could not influence the preceding judgments about the individual. For the check, subjects reported the extent to

which they perceived each of the three focal characteristics described the would-be founder, on a five-point scale ranging from Strongly Disagree to Strongly Agree. The results of the check quantitatively test whether the manipulation consistently and significantly manipulated perceptions of ADHD disinhibition. These results are presented in Chapter 4-Results.

Dependent and Mediating Variables

Following Baron and colleagues (2006), after presentation of the stimuli, the subjects evaluated the target individual and associated venture. Specifically subjects responded to the subsequent questions, providing judgments about the target entrepreneur, interest in joining the pursuit, and the likelihood of venture success. The connection between items, variables, and analyses of the next chapter are outlined here. Discussion of quantitative analyses and results follows in Chapter 4-Results (including factor analyses and estimated alpha reliabilities).

Judgments about the Target Entrepreneur

Hypothesis 1 suggested that unlike prior studies outside of the entrepreneurial domain, ADHD disinhibition in a target founder would not be an interpersonal liability on others' interest to generally interact. Based on Canu et al. (2008), subjects responded to the following items, using a five-point scale from *very unlikely* to *neutral* to *very likely*.

In terms of the entrepreneur, would you want to...

- *Briefly talk with this person?*
- *Meet this person for a coffee/other refreshment?*
- *Get to know this person?*

Here, as in all subsequent items and variables, higher scores reflect more favorable ratings. Also, here, and on subsequent Likert-type items, responses were scored on five-point scales from -2 to 2. This served to reflect responses ranging from a negative, to neutral, to

positive. Thus numerical scores conceptually align with the response, with zero reflecting the mid-point.

Responses to these individual items were summed into a single variable, reflecting the interest to generally interact with the would-be founder. With results discussed in the next chapter, the effect of ADHD disinhibition on interest to generally interact was tested in two ways. It was tested by comparing within-subject ratings of the ADHD+ and ADHD- targets, expecting that the ADHD+ target will not generate significantly lower ratings. It was also tested in a second way, by exploring whether the mean rating of the ADHD+ target is equal or greater than *neutral*. In other words, the second test examined whether subjects are at least neutral on interacting with the target.

Hypotheses 2a and 2b respectively suggested that ADHD disinhibition in a target would be positively related to assessments of the target's generative qualities (creative, visionary, idea generation, recognizing opportunities) and negatively related to administrative qualities (reliable, consistent, planning next steps, implementing). Hypothesis 2c posited that ADHD disinhibition in a target would be neither negatively nor positively related to other judgments (i.e., intelligent, trustworthy, hardworking). Based on Baron et al. (2006) and similar social psychological research, subjects rated the target on various traits (using five-point scales). The items corresponding to generative, administrative, and other qualities are denoted here with a *g*, *a*, or *o* in brackets.

What is your assessment of his [the entrepreneur's] ability in the following activities?

He would be good at.....

- *Generating ideas. [g]*
- *Recognizing entrepreneurial opportunities. [g]*
- *Defining the steps to go from an idea to a desired outcome. [a]*
- *Implementing ideas all the way to a finished product. [a]*

How much do the following describe the entrepreneur?

- *Creative [g]*
- *Visionary [g]*
- *Reliable [a]*
- *Consistent [a]*
- *Intelligent [o]*
- *Hardworking[o]*
- *Trustworthy[o]*

Responses to these individual items were summed into their corresponding variable, reflecting the overall assessments of “generative qualities,” “administrative qualities,” and “other qualities.”

Hypothesis 3a posited that ADHD disinhibition in a target would be positively related to perceptions of competence as an entrepreneur over other work positions. Hypothesis 3b posited that ADHD disinhibition in a target would be negatively related to perceptions of competence as a manager. Accordingly, subjects made judgments of how competent they believed a target would be based on the following items. Again, a five-point scale was employed, ranging from *very incompetent* to *very competent*.

How competent do you think this person would be as... ?

- *an entrepreneur*
- *an employee*
- *a manager*
- *a team member*

For a direct test of Hypothesis 3a, t-tests examine whether the ADHD+ target was judged to be significantly more competent as an entrepreneur than in the other positions (i.e., a within condition test). For Hypothesis 3b, a different t-test compares the judgments of competence as a

manager between the ADHD+ target and ADHD- target. Based on the randomized experimental design, the subsequent results provide a causal test of the effect of the manipulation.

Judgments about Venture Success Likelihood

Hypothesis 5 proposed that ADHD disinhibition in a would-be founder undermined perceptions of the likelihood of venture success. Accordingly, subjects provided judgments of success likelihood for the two ventures. To do so, subjects responded to the following two items.

Considering the two ventures presented, what would you estimate the likelihood of success is for each?

- *Venture #1: % Likelihood of Success (0%-100%)*
- *Venture #2: % Likelihood of Success (0%-100%)*

For within-subject hypothesis testing, the subject's two responses were tested against each other. For example, at a within-subjects level, a subject might judge the venture of ADHD+ condition as 30% likely to succeed and the venture of ADHD- condition as 50% likely to succeed. The hypothesis is thus be tested by examining whether the ADHD+ condition undermines (i.e., yields lower) likelihood of success judgments.

Interest in Joining the Entrepreneurial Pursuit

Hypothesis 6 suggested that ADHD disinhibition in a target is negatively related to other individuals' interest in joining the pursuit. To assess this, subjects responded to the three items below. The first two items were on a five-point scale ranging from *very uninterested* to *very interested*.

For the third item, subjects indicated the likelihood (from 0% to 100%) they would join the venture as an employee. To ensure a concrete and consistent basis for the relative likelihood judgments of joining the pursuits (within-subjects and between-subjects), a salary with stock-options was specified. The salary was relatively low (below average exit salaries for the sample)

yet accompanied by stock-options. This reflected the reality of what a very early stage venture might offer, including the realism of stock-options being an important part of compensation.

How interested are you in working with such a venture as...

- *an intern*
- *an employee*

If you received an employment offer on graduation from the entrepreneur (with a \$25,000 salary and stock-options), what is the likelihood you might accept it, presuming you had another offer elsewhere?

- *Likelihood of Accepting Offer (0%-100%)*

In the next chapter, responses to all three of these items are analyzed. The analyses primarily focus on the likelihood judgment. This is because the likelihood of accepting an offer to join the pursuit more closely resembles interest in relation to expected field behavior. It also offers superior interpretability than a variable aggregating two Likert items and one probabilistic (0-100%) item.

Note: I do not suggest that a subject's reported likelihood of accepting an offer would perfectly match ultimate field behavior (actually accepting such an offer); however, based on the experimental design the critical question is about the *difference* in the reported likelihoods between the venture of the ADHD+ and ADHD- condition. Also, this is in line with most experimental designs where subjects make decisions reflecting of their judgments or preferences in a lab setting (e.g., Gregoire & Shepherd, 2012; Kahneman & Tversky, 1979).⁵

⁵ In terms of the external validity, the tighter the coupling between the reported likelihoods and actual field behavior, the stronger the explanatory connection between the independent variable and the field. That said, akin to the imperfect coupling of *intentions* with later *behavior*, an imperfect connection between these assessments and eventual field behavior does not nullify the relationship with the independent variable. It simply reduces the size of its effect in the field.

Controls

The two experimental design factors unrelated to the hypotheses, the idea content and order, were tested for possible effects. Results are reported in the next chapter. At this point, I would simply note the following. While some subjects could have a greater preference for one idea, other subjects could prefer the alternative idea. Given random assignment and balancing with ADHD+/- condition, idiosyncratic idea preferences would not present confounds. Idea or order effects could increase error, thereby increasing the difficulty of finding statistically significant relationships. Considering that the experimental factors unrelated to the hypotheses did not produce systemic effects, more parsimonious tests were typically used for simplicity and for greater statistical power (larger cells and fewer degrees of freedom lost to controls).

Considering the research hypotheses and the randomized, counterbalanced, within-subject experimental design, modeling was not complicated with individual subject control variables. Discussion of this follows as the remainder of this subsection.

To test the research hypotheses, modeling with subject control variables was not necessary (given the randomized, counterbalanced, within-subject design). To illustrate why, consider the following examples first gender, and then subject disinhibition. Assume that women on average prefer one entrepreneurial idea over the other, or more negatively evaluated entrepreneurs with ADHD disinhibition. Due to random assignment and counterbalancing, this would not confound the results; an approximately equal number of women would receive the ADHD+ versus ADHD- founder associated with the preferred idea, nullifying any gender confound. Similarly, if men more negatively judged ADHD+ founders, or were generally less interested in joining entrepreneurial ventures, this would not confound the hypothesis testing

based on the within-subject design. Finally, in relation to between-subjects tests, given random assignment, gender represents a random variable and thus does not threaten to bias results.

As another example, it is conceivable that subjects higher in ADHD disinhibition are relatively more favorable in their judgments of the ADHD+ target. However even if this were the case, per the within-subject randomized design it should not confound the results; subject-to-target homophily would increase the risk of non-findings, with the judgments of subjects higher in ADHD disinhibition offsetting those lower in ADHD disinhibition. In any case, homophily is not expected for two reasons. Past psychology research has found that both ADHD and non-ADHD subjects respond negatively to ADHD in a target (e.g., Chew, Jensen, & Rosen 2009). Also, subjects higher in ADHD disinhibition are typically aware of their own struggles with conscientious follow-through and implementation, which could counteract any homophily in evaluating the ADHD+ target's administrative qualities, competence as a manager, likelihood of success, and interest in joining the pursuit.⁶

In sum, while considering gender or other subject-level variables would be interesting, these individual subject factors are beyond the scope of the 12 specified hypotheses. Subject control variables are not needed for the hypothesis testing, based on the fact that with an experimental design using random assignment, “although there are still unmeasured variables, there is no longer an unmeasured variables problem (James, 1980), [since] random assignment [is] ‘the great ceteris paribus’ of causal inference (Cook & Campell, 1979: 5)” (Colquitt 2008: 616). Attempting to control for omitted variable bias is not necessary given a randomized

⁶ This was exemplified by one of the individuals who tested the instrument. This individual, with clinical ADHD status, remarked how she “totally identified” with the ADHD+ target, yet because of her familiarity with associated strengths and weaknesses, she had higher assessments of the likelihood of venture success and of joining the ADHD- target.

experimental design, as duly noted not just by scholars of the psychological sciences but also econometricians (Angrist & Pischke, 2008).

Sample

The target population for the study was individuals who could be early-stage resource providers to a would-be founder. Broadly, this includes most any adult of working age who might provide initial labor directly, or support the pursuit indirectly by introducing the would-be founder to contacts who could provide labor or other resources.

University students, particularly business students, sample part of this broad population. As would-be founders often start entrepreneurial pursuits while still in school, university students are often the first potential recruits. Also, would-be founders are typically unable to offer salaries competitive with established organizations. Thus would-be founders may seek out business students, as their labor is accessible at low cost, or possibly no cost as interns. Additionally, unlike most employees, business students are or will soon be looking for internship or paid work opportunities. Also, business students may be required to complete internships with entrepreneurial ventures (e.g., for the Leeds Business School Entrepreneurship certificate). Finally, in comparison to older individuals looking for work, business students also represent a valid population of potential nascent venture labor. Older individuals on average can be expected to require a more-established venture/firm that is capable of providing higher and more certain pay, and also providing health-insurance if in the United States and other countries lacking socialized medicine.

The sample of the study was composed of 147 business students enrolled in a large marketing course required for all business majors. For an experimental design, particularly a

controlled within-subjects design, this reflects a good sample size. A sensitivity power analysis is presented at the end of this chapter.

Participation was in exchange for course credit. Subjects were provided a link to the electronic instrument for the study and completed it on a computer. Random assignment and counter-balancing were implemented with the Qualtrics software that was used for administration. The sample was 66% male, with a median age of 20 (mean=20.9). In terms of ethnicity, 91% identified as Caucasian (exclusively or in part). The majority of the sample was Juniors, with the remainder Sophomores and Seniors.

The sample does not represent all types of individuals who might evaluate or join a would-be founder as initial labor. However, the sample fits the hypotheses and experimental design. The sample is also in line with Colquitt's (2008: 616) call for laboratory studies "defined as studies involving undergraduate participants that occur in an environment that was created for research purposes."

Context provided to Sample

The following passage was provided to subjects, explaining the apparent nature of the instrument they were to complete. The language was crafted in order to maintain a critical sense of realism, while also covering the requirements for human subjects research.

*[You] will provide **real business student input on real entrepreneurial ideas and prototypical entrepreneurs.***

The Leeds School of Business Deming Center for Entrepreneurship is contacted by a lot of start-up entrepreneurs. The entrepreneurs are often seeking support from the business school and access to Leeds business students. Since there are so many requests, and many start-ups fail, it is difficult to determine which entrepreneurs and ideas to work with. Students have some unique insights into this question, particularly for start-ups that are interested in working with Leeds or potentially recruiting Leeds students. The

purpose of this exercise is to get YOUR input, as a Leeds student, on entrepreneurial opportunities.

On the following screens, you will read brief descriptions of a couple entrepreneurial ideas and typical entrepreneurs. Afterward you will evaluate: the idea, the entrepreneur, and whether you think the two together might be a good opportunity for Leeds students. To understand how individual student differences are important there will also be some questions about you. The responses you provide are confidential. Responses from students will be combined into a summary which will be provided to the Deming Center. The results may help the Center or entrepreneurship instructors select the types of opportunities and entrepreneurs of greatest interest to Leeds students. ...

Thank you for providing an important real student perspective and evaluation!

Pilot Testing of the Research Instrument

Prior to the actual data collection, pilot versions of the instrument were tested on several business students and working professionals. Examination of the completed instruments and discussions with the pilot individuals confirmed that the exercise and questions were understood, and the context was believed. The tests also confirmed that the randomization and counter-balancing logics were properly specified in Qualtrics.

Data Checking

Various checks were built into the electronic instrument and its administration. This was done based on the potential for careless responding. The Qualtrics instrument was set to require responses to all items. If a subject missed any items and attempted to proceed to the next screen, Qualtrics highlighted the missed item(s) and required responses before advancing. This eliminated the potential problem of missing data. In order to be able to check for careless responding, the Qualtrics instrument was also specified to record extensive back-end metrics (e.g., the time spent on each screen, the number of clicks per screen). A few responding-check

items were included in the questions (e.g., “*I am reading these questions and accurately responding*” and “*I have never used a computer.*”)

The back-end data, the responses to the responding check items, and the overall responding pattern were checked for careless responders. This is further described in the next chapter.

Ultimately, careless responding presents the danger of Type II error (i.e., no statistically significant findings, in spite of a true effect), not Type I error (i.e., false-findings). Based on the design, careless responding by subjects increases error, thereby making any results more difficult to detect at a specified level of certainty (e.g., $p < .05$). If some subjects responded carelessly, it empirically increases the noise to signal ratio, and thus reduces the calculated certainty about a (non-null) effect. Thus, if finding a statistically significant effect in the presence of careless responders, the true significance and effect size would be even greater.

Sensitivity/Power Analysis

The graphs below show sensitivity analyses for the experimental design. Specifically, they show the effect size necessary (Y-axis) to reject the null hypothesis at a given power level (X-axis), based on a specified α and sample size. For these calculations, α was specified at .05. The sample size was specified as 130, to reflect the likelihood of having to drop some subjects due to careless responding.

Figure 2 reflects a simple t-test comparing whether the mean within-subject differences (in ratings of the ADHD+ to ADHD- target on a particular variable) differ from zero. Based on Cohen’s d, small effects may be 0.2 or 0.3, medium effects around 0.5, and large effects 0.8 or greater (Cohen, 1998). This graph indicates that if there is a small effect, it should be detected.

The second graph, Figure 3, reflects a more sophisticated sensitivity analysis. It represents a test of the effect of the IV on a repeated measure (e.g., managerial competency judgments). These results also suggest that a small effect should be detected.

Figure 2: T-Test Difference Sensitivity Analysis, Power (X-axis) Needed to Detect True Effect Size (Y-axis)

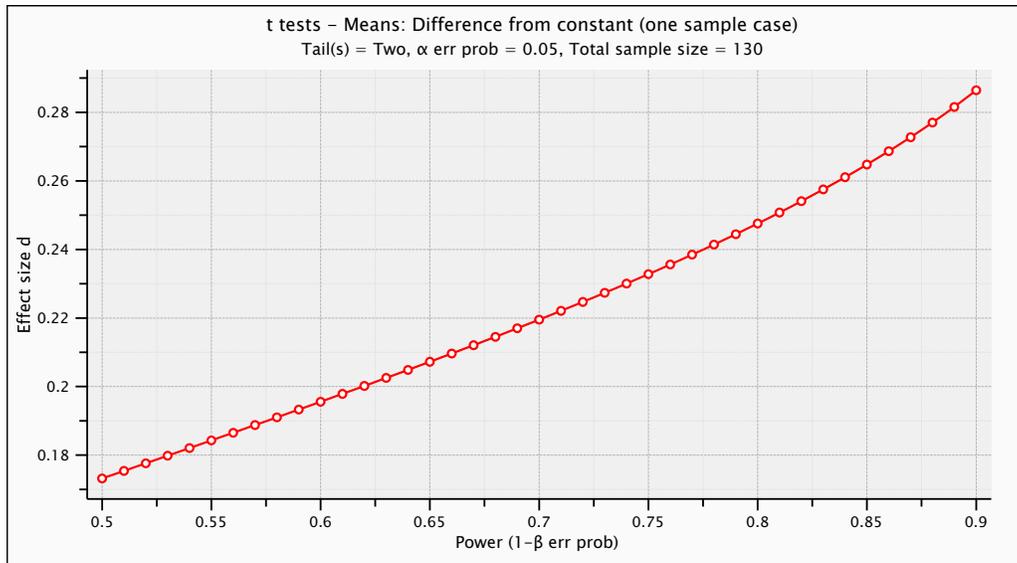
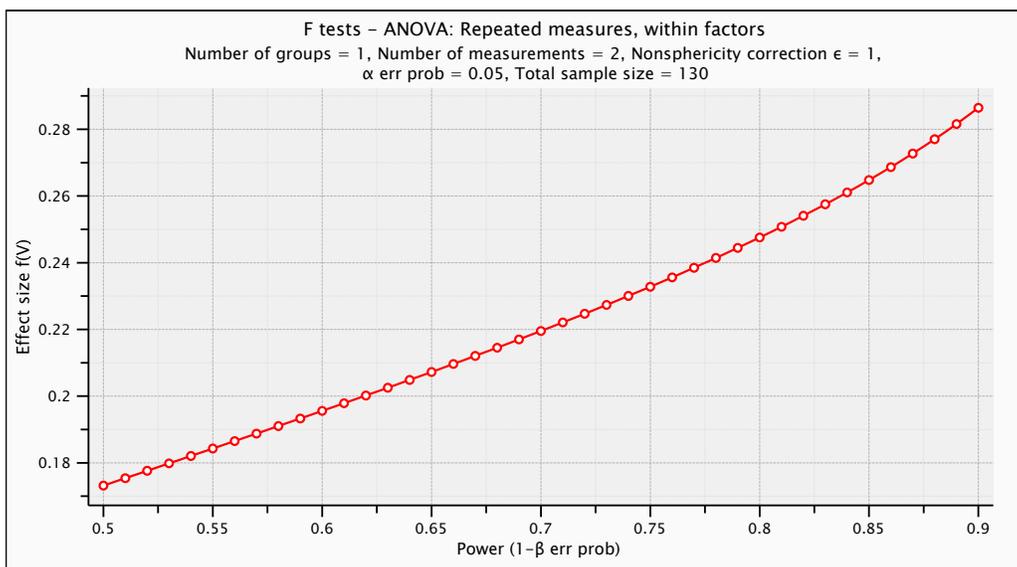


Figure 3: Within-Subject Repeated Measures ANOVA Sensitivity Analysis, Power (X-axis) Needed to Detect True Effect Size (Y-axis)



Chapter 4

Results

This chapter reports the empirical analyses and associated results. The first subsection overviews the data. Then, factor analyses and estimated reliabilities are reported for variables composed of multiple items. Thereafter, tests related to the manipulation check and possible order or order effects are reported. Following this, the main effect results of ADHD disinhibition are presented (Hypotheses 1, 2a-c, 3a-b, 5a, 6a). Lastly, regression path analyses are reported testing the other pathways hypothesized (Hypotheses 4a-b, 5b, 6b). Further discussion of the results is reserved for *Chapter 5-Discussion*.

Data Overview

Completed instruments were received from 147 subjects. Before data analysis, responses were screened for careless responding. This was done based on back-end data metrics, responses to specific responding check items, and the overall responding pattern. In terms of the various metrics recorded, the following were examined: the total time to complete instrument, the time spent on each screen, the number of clicks per screen, and data indicating that the instrument was completed on a computer versus a smart-phone.

The data from thirteen subjects were dropped based on this screening. An example of a dropped subject is Respondent X (anonymous response ID: *R_2smi36xSAV4vH0I*). This subject: 1) failed a number of the responding checks, 2) showed a total completion time that was highly suspect (substantially shorter than the fastest 5% percent of respondents and shorter than all non-careless responders), 3) showed suspect per screen responding times (i.e., completion of screens in about the time it would take to click through the items without reading or considering any text

and items, and inherently shorter than most respondents), and 4) a pattern of excessive clicks on each screen (e.g., 50 clicks on a screen where there were only 24 items to click) which when combined with the prior indicators, suggests not just careless clicking but moreover careless and invalid data. The decision to exclude the other handful of subjects was also based on a case showing a number of these indicators. The judgment to exclude a case was not based on a quantitative algorithm, but rather a qualitative judgment considering (and requiring) multiple indicators.

Dropping 13 of the initial 147 responses corresponds to 8.8%. This quite closely aligns with past findings indicating that around 11% of students completing survey instruments for course credit appear to be careless responders (Meade & Craig, 2012). The subsequent analyses do not include the 13 cases indicative of careless responding. Thus the final sample used consisted of 134 subjects.

Item Scoring and Variables

Likert-type items were scored on a five-point scale. The scale numerically ranged from -2 to 2. This served to reflect responses ranging from a negative (e.g., disagreement or disinterest) to neutral, to positive (e.g., agreement or interest). Thus numerical scores conceptually align with the response, with zero reflecting the mid-point. For variables composed of multiple items, the individual items were summed and then averaged. Table 3 below summaries the variables collected and associated items.

Table 3: Summary of Primary Variables

Variable	Summary of Items (on 5-point Likert scales except when noted otherwise).
Interest in Interacting Generally	Three items on the extent to which subject would be interested to 1) briefly talk with the target, 2) meet the target, 3) get to know the target.
Judgment of Generative Qualities	Four items on the extent to which the target is assessed to be 1) creative, 2) visionary, 3) good at generating ideas, 4) good at recognizing opportunities.
Judgment of Administrative Qualities	Four items on the extent to which the target is assessed to be 1) consistent, 2) reliable, 3) good at defining next steps, 4) good at implementing.
Judgment of Other Qualities	Three items on the extent to which the target is assessed to be 1) intelligent, 2) hardworking, and 3) trustworthy.
Judgment of Competence as an Entrepreneur	Item indicating the extent to which the target is thought to be competent as an entrepreneur.
Judgment of Competence as a Manager	Item indicating the extent to which the target is thought to be competent as a manager.
Judgment of Likelihood of Venture Success	Item indicating the estimated likelihood of venture success (0-100%).
Judgment of Interest in Joining Venture	Three separate items on the extent to which the subject is interested in joining the pursuit. 1) The estimated likelihood of accepting an offer to join the venture (0-100%). Also, Likert-scale interest in joining the venture as 2) an intern, 3) an employee. These items were not aggregated since the <i>likelihood of accepting an offer</i> item provides a more meaningful indication of the ecological outcome of concern and interpretation would be compromised if aggregating with the Likert items.
<i>manipulation check</i>	Three items indicating the extent to which the target is assessed to be 1) impulsive, 2) hyperactive, and 3) inattentive.

Factor Analyses and Reliabilities

As indicated above and in Chapter 3, four dependent variables were assessed by multiple-item scales: the *interest to generally interact*, *generative judgments*, *administrative judgments*, and *other judgments* of the target entrepreneur. Likewise, there were three items related to *interest in joining the venture*. Factor analysis was used to see if the items of a variable loaded to single factor and the variable scales appeared uni-dimensional. For robustness, the analyses were run a number of times with varying factor extraction and rotation methods. The results were

similar whether specifying principal component analysis, principal axis factoring, or alpha factoring extraction – with Varimax (orthogonal) or Promax (oblique) rotation.

The factor analyses reported are based on principal component analysis factor extraction, and Varimax rotation for the multifactor solutions. Factor analyses were run separately on subject responses to both the ADHD+ and ADHD- stimuli (i.e., Entrepreneur/Venture 1 and 2, randomizing order). As results were generally similar for both, the factor analyses and reliability estimates are reported for the focal ADHD+ data.

In terms of Hypothesis 1, subjects responded to three questions related to their interest in interacting generally with the entrepreneur. As expected, the 3 items load to a single common factor. The single factor shows an initial eigenvalue of 2.25, explaining 75% of the variance. Given the single factor, there was no rotated factor solution. Also, in separate factor analyses including the items of other variables, these three items loaded to their own unique factor (shown in Table 4 at the end of this subsection). The three items together yield a Cronbach's Alpha estimate of .83. Accordingly, the items were summed and averaged to an overall variable.

In terms of Hypotheses 2a and 2b subjects evaluated a total of eight items, related to judgments of the entrepreneurs' generative and administrative qualities. Hypothesis 2c related to other judgments based on three additional items (intelligent, trustworthy, and hardworking). Factor analysis with Varimax Rotation on the eight items corresponding to the generative and administrative judgments confirmed the expected two factor loading. Two factors emerged, explaining 60% of the variance, in line with *generative* and *administrative* judgments as proposed in Chapter 3. When also including the three additional items related to other judgments (H2c), similar factor analysis on the eleven items (for H2a-c), confirmed the expected three factor solution. The rotated three factor solution explained 61% of the variance, loading to

generative, administrative, and other judgments as proposed in Chapter 3. In both cases, each rotated factor explained a similar proportion of the variance. Reliability estimates of the items composing the generative factor, administrative factor, and other factor were respectively .73, .80, and .71. The individual items were summed and averaged to each of the three variables.

In terms of Hypothesis 6, subjects responded to three questions related to their interest in joining each venture. Factor analysis of these items confirmed the three items load to a single factor. Together they yield a Cronbach's Alpha estimate of .82 based on standardized items. As suggested in Chapter 3, since the *likelihood of accepting an offer to join* provides a closer indication of the ecological outcome of concern than Likert judgments, these items were not aggregated (as interpretation the aggregated variable would be compromised). Subsequent analyses focus primarily on the subjects' reported likelihood of accepting an offer to join the venture. The single factor and relatively good reliability suggests that tests of Hypothesis 6 would be similar based on an aggregated item variable.

Table 4: Rotated Factor Item Loadings, showing Interest to Interact, Generative and Administrative Assessments, and Interest to Join.

	Rotated Component Matrix ^a			
	Component			
	1 ("Administrative Qualities")	2 ("Interest to Interact")	3 ("Interest to Join")	4 ("Generative Qualities")
Consistent	.850			
Reliable	.810			
Defines Steps	.750			
Implements	.673			
Interact, Meet in Person		.896		
Interact, Get to Know		.792		
Interact, Talk with		.751		
Interest as Intern			.813	
Interest as Employee			.806	
Interest in Accepting Offer			.756	
Creative				.781
Generates Ideas				.727
Visionary				.693
Recognizes Opportunity				.645

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.^a

a. Rotation converged in 6 iterations.

Coefficients below $|\cdot 4|$ not shown.

Results of the factor analyses supported the aggregate item variables (i.e., interest to generally interact, assessments of generative and administrative qualities, and interest in joining the venture). Cronbach's alpha estimates for the said variables were all above the heuristic threshold of .70.

Absent other evidence of measurement reliability, the estimated alpha of .73 for the overall assessment of generative qualities suggests some possible noise or imperfection in tapping a single uni-dimensional construct. Based on only four items, the estimated alpha might have been higher had additional items been included. In any case, empirically this is not of undue concern for Hypothesis 2a given the significant results. Increased measurement error increases

the likelihood of non-significant results, not rejecting the null hypothesis, and thus Type II error. Theoretically, it suggests further research could refine the operationalization of generative qualities.

The alpha of .71 related to the items of Hypothesis 2c (Judgments of Other Qualities) is not surprising considering it was based on only three items and the somewhat atheoretical nature of the *Other qualities* variable (i.e., the grouping of intelligent, hardworking, and trustworthy). Also, Hypothesis 2c was not central to the research model, but simply served as an additional test of the social psychological effects of ADHD disinhibition on individuals' judgments beyond generative and administrative qualities.

Variable Means and Standard Deviations

The variable means according to independent variable level (i.e., ADHD+ and ADHD-condition) are show in Table 5 for the entire sample. For convenience, the table lists the hypothesis number associated with the particular statistics as well as a t-test of the mean differences.

Table 5: Full-sample Variable Means, Standard Deviations, and Mean Difference T-tests

Paired Means (by ADHD+/- condition, except H3a)		Mean	Std. Deviation	t-statistic
Manipulation Check				
	ADHD+	1.04	0.636	16.17***
	ADHD-	-0.43	0.662	
Interest to Interact				
H1	ADHD+	0.83	0.811	n.s.
	ADHD-	0.88	0.751	
Generative Qualities				
H2a	ADHD+	1.18	0.531	6.87***
	ADHD-	0.74	0.687	
Administrative Qualities				
H2b	ADHD+	-0.02	0.727	-12.05***
	ADHD-	1.06	0.673	
Other Qualities				
H2c	ADHD+	0.80	0.568	-5.28***
	ADHD-	1.11	0.608	
Relative Competences <i>within ADHD+</i>				
H3a	as Entrepreneur	1.05	0.936	4.54***
	as Employee	0.54	0.907	
	as Entrepreneur	1.05	0.936	6.50***
	as Manager	0.29	1.237	
	as Entrepreneur	1.05	0.936	3.46***
	as Team Member	0.69	0.945	
Competence as Manager				
H3b	ADHD+	0.29	1.237	-7.58***
	ADHD-	1.26	0.892	
Competence as Entrepreneur				
n.a.	ADHD+	1.05	0.936	n.s.
	ADHD-	1.03	0.822	
Assessed Likelihood of Venture Success				
H5a	ADHD+	51.60%	22.342	-3.42***
	ADHD-	58.28%	22.277	

Interest to Join Pursuit				
as Accepting Job Offer				
	ADHD+	36.36%	23.599	-3.27***
	ADHD-	42.10%	23.795	
as Joining as Employee (Likert)				
H6a	ADHD+	-0.04	1.259	-2.48*
	ADHD-	0.27	1.287	
as Joining as Intern (Likert)				
	ADHD+	0.19	1.374	-2.26*
	ADHD-	0.43	1.211	

N=134. *** significant at .001, ** at .01, * at .05, n.s. not significant at .1, (two-tailed).

There was a difference in a few variables in the ADHD- condition according to the randomized order of its appearance (i.e., whether it was the first or second condition). This is later discussed in detail in relation to the analyses of possible order effects. Table 6 reports the means of these variables, for the half of the sample randomly assigned to the ADHD- condition first. This half was chosen for more conservative results, since this is the portion of the sample where the hypothesized significant differences between ADHD condition are less likely.

Table 6: Conservative Half-sample Means, Standard Deviations, and Mean Difference T-tests, on Variables with Partial Order Effect

Paired Means (by ADHD+/- condition)		Mean	Std. Deviation	t-statistic
Manipulation Check				
	ADHD+	1.03	0.676	9.21***
	ADHD-	-0.16	0.574	
Administrative Qualities				
H2b	ADHD+	.023	0.827	-4.90***
	ADHD-	.667	0.605	
Other Qualities				
H2c	ADHD+	.732	0.641	n.s.
	ADHD-	.869	0.604	
Competence as Manager				
H3b	ADHD+	.379	1.356	-2.70**
	ADHD-	.894	1.054	

n=66. *** significant at .001, ** significant at .01, n.s. not significant at .1, (two-tailed).

Manipulation Check

As noted in Chapter 3, a manipulation check was included to assess whether the experimental manipulation was effective in inducing perceptions of ADHD disinhibition. For the check, subjects reported the extent to which each of the three focal characteristics described the would-be founder. To test whether the manipulation led to significantly greater perceptions of ADHD disinhibition in the ADHD+ condition, paired samples t-tests examined judgments. Here, *paired samples* refers to the paired sampling of judgments about the two different targets (e.g., the judgments of impulsivity in the ADHD+ condition paired with the similar judgment in the ADHD- condition).

In particular, t-tests were run on the associated judgments – empirically testing whether the manipulated descriptions/stimuli led to the ADHD+ condition target (“Andrew”) being perceived as more 1) impulsive, 2) hyperactive, 3) inattentive, and 4) an aggregate of the three. Table 7 provides the detailed statistics of the paired samples test. The results indicate that the manipulation was effective. The description of the ADHD+ condition induced perceptions corresponding to greater ADHD disinhibition; that is, a target significantly higher in all of the defining characteristics than the ADHD- target.

Table 7: Manipulation Check

Paired Comparisons (ADHD+ vs. ADHD- condition)	Paired Differences		t
	Mean	SD	
Impulsive	2.05	1.555	15.22***
Hyperactive	1.45	1.230	13.63***
Inattentive	0.93	1.358	7.89***
Overall (aggregate)	1.47	1.054	16.17***

N=134. *** significant at .001.

This indicates that the manipulation was effective in creating the overall ADHD+ and ADHD- conditions (overall mean difference: 1.47, 1.04 versus -.43, $t_{1,133}=16.17$, $p < .001$). In sum, the written stimuli effectively manipulated perceived ADHD disinhibition. In the words of the research stimuli, *Andrew* (ADHD+ condition) was perceived significantly higher than *Thomas* (ADHD- condition) in ADHD disinhibition.

To further assess the manipulation, four additional t-tests were run. These were one-sample (not paired) t-tests. These additional tests assessed whether the relevant perceptions of the ADHD+ target were significantly greater than zero. In other words, on a five-point scale (-2 to 2), the tests considered whether subjects judged the ADHD+ target to be sufficiently above the midpoint. The results were significant for three of the one-sample t-tests. The *overall* perception based on the aggregated judgments was significantly greater than zero, as were the *hyperactive* and *impulsive* judgments (all $t_{1,133}$ statistics > 18.46 , all p statistics $< .001$). The *inattentive* judgment, however, was not significantly above the midpoint ($t_{1,133}=1.24$, $p = .217$, two-tailed). This indicates that on average subjects did not rate the ADHD+ target as highly inattentive. This would be concerning if results of the paired samples t-test had not indicated subjects perceived the ADHD+ target as significantly higher in inattentiveness than the ADHD- target. However since a significant difference was shown between the two experimental conditions, the manipulation appears effective in creating the overall ADHD+ and ADHD- conditions.

In sum, results of four paired samples t-test provide empirical evidence that the manipulation consistently and significantly manipulated perceptions of ADHD disinhibition between the two conditions. Three of four additional tests indicated that the manipulation led to significantly positive raw scores (i.e., absolute, versus relative scores).

Possible Effect of Entrepreneurial Idea

As discussed in Chapter 3, two different entrepreneurial ideas were used to enhance the realism of the descriptions (i.e., stimuli) provided. The idea factor was crossed with the independent variable so any idea effect could be parceled out if necessary. The basic question tested was the following: does the entrepreneurial idea (i.e., the shoes versus jacket) affect any of the dependent variables? For example, are judgments in the ADHD+ condition or in the ADHD- condition affected by whether either target is associated with the shoe or jacket idea?

Independent samples t-tests were run on a set of 24 possible dependent variables, with grouping specified by Idea (i.e., shoes versus jacket). For example, one of the 24 tests was whether the entrepreneur in the ADHD+ condition was judged differently on his generative qualities depending on whether he was associated with the shoes or jacket idea. Other tests were, for example, whether subjects' interest in joining the ADHD+ venture differed according to the idea, as well as equivalent tests for the ADHD- venture.

Results of the 24 tests indicated there was not an idea effect. In 23 of the 24 tests, there was no significant difference (all p statistics $> .05$). Based on 24 tests, without a Bonferroni correction/adjustment, finding one or more significant differences was 71% likely. After the Bonferroni adjustment, the 24th test also did not suggest any idea effect. Furthermore, given the randomized counterbalanced design, even if there were a true effect of the ADHD- entrepreneur being judged (between-subjects) as higher in generative qualities when associated with the jacket idea, it would not materially affect the hypothesis testing.

Possible Order Effect

Since subjects evaluated two stimuli (i.e., the two ADHD disinhibition conditions), the order of stimuli presentation could have an effect. While the randomized counterbalanced

ordering would overall average-out any order effect, the effect of order was tested. The order effect question was: does the order in which subjects evaluate the two stimuli affect dependent variables? For example, are dependent variables in the ADHD+ condition different according to whether the ADHD+ condition appears first or second – e.g., is *Andrew* rated differently (in generative qualities) depending on whether he is judged before or after *Thomas*?

Similar to the testing for possible Idea effects, independent samples t-tests, this time based on Order, were run on the dependent variables. Given the number of tests, Bonferroni adjustment to critical *p*-values (i.e., corrected alpha) was prudent. With no correction, likelihood of finding one or more significant differences was 82%. The test results indicated no effect of order on 29 of 33 dependent variables. The four exceptions were all judgments in the ADHD- condition, specifically judgments of the ADHD- entrepreneur's administrative qualities, other qualities, competence as a manager, and the overall manipulation check variable. For these dependent variables, when the ADHD- condition appeared second, the (ADHD-) entrepreneur received mean ratings of a similar valence to when he appeared first, but the ratings were slightly higher in absolute terms. In other words, when the ADHD- target appeared *after* the ADHD+ target, the ADHD- entrepreneur was judged to be even higher in administrative qualities, other qualities, and in competence as a manager, and even lower in the manipulation check variable (than when the ADHD- target appeared first).

In sum, for 4 of 33 variables there did appear to be unidirectional contrast effect. Given the hypotheses and the randomized counterbalancing, this does not threaten the hypothesis testing itself. Nonetheless, hypothesis tests involving these three dependent variables and involving the manipulation check were subsequently rerun on the sub-sample that received the ADHD- condition first (n=66), since this offers a more conservative robustness test. It is more

conservative since when the ADHD- entrepreneur was received first, his average ratings were closer to the ADHD+ entrepreneur. Results of these tests are presented immediately following the respective full-sample test, with the exception of the full-sample manipulation check test already presented above.

When the manipulation check was rerun on the half sample where the difference between the conditions was relatively smaller, the overall check variable was still significantly higher in the ADHD+ condition than in the ADHD- condition (Means: 1.03 > -.17, $t_{1,65}=9.21$ $p<.001$). Also, all three of the individual indicators were significantly greater in ADHD+ condition (all $t_{1,65}$ statistics >5.5, all p statistics <.001).

Disinhibition Main Effect Results

The majority of the research hypotheses were related to disinhibition main effects. In particular, the main effect of ADHD disinhibition was the focus of the research and corresponded to Hypothesis 1, 2a-c, 3a-b, 5a, and 6a. This subsection reports the empirical tests of these hypotheses. Each is reviewed in turn. This section concludes with the results of a repeated measures general linear model analysis, providing a robustness test and η_p^2 effect sizes.

Hypothesis 1

Hypothesis 1 posited that disinhibition presented by a would-be founder would not be a liability on others' interest to interact generally. While not central to the overall hypothesized model, null results would offer a point of comparison to non-entrepreneurial studies where ADHD disinhibition reduced others' interest in interacting. Alternatively, if a significant negative effect was found, it would indicate another obstacle for would-be founders exhibiting ADHD disinhibition.

A paired samples t-test empirically tested whether subjects were less interested in generally interacting with the ADHD+ entrepreneur than the ADHD- entrepreneur. The results indicated there was no difference (i.e., no effect of ADHD disinhibition condition), supporting the hypothesized null effect. In other words, the mean interest in general interaction with the two targets did not differ (ADHD+ versus ADHD- Means: $0.83 \approx 0.88$, $t_{1,133} = -0.715$, $p = .476$). A secondary one-sample t-test was also run, to examine whether the ADHD+ mean was in absolute terms significantly different than the scale midpoint of zero. The results confirmed that the ADHD+ mean was significantly greater than zero (Mean: $0.83 > 0$, $t_{1,133} = 11.89$, $p < .001$); this further supports the general hypothesis that in an entrepreneurial setting, ADHD disinhibition does not present a liability on interest to interact generally.

Hypotheses 2a-c

Hypotheses 2a-c posited that disinhibition presented by a would-be founder would have differential effects on judgments of generative, administrative, and other qualities. Consistent with the prior and subsequent main effect hypothesis testing, paired samples t-tests examined whether judgments differed according to ADHD condition.

The results supported Hypothesis 2a, indicating that the ADHD+ target was perceived higher in generative qualities than the ADHD- target (Means: $1.18 > .74$, $t_{1,133} = 6.87$, $p < .001$). The results also supported Hypothesis 2b, indicating that the ADHD+ target was perceived to be significantly lower in administrative qualities (M: $-.02 < 1.06$, $t_{1,133} = -12.05$, $p < .001$). As previously noted, given a small order effect on judgments of the administrative qualities of the ADHD- target, the test was rerun on the half sample less likely to support a significant difference. Here too, Hypothesis 2b was also supported in the half-sample (M: $.02 < .67$, $t_{1,65} = -4.90$, $p < .001$). These results also held with bootstrap resampling (specified for a 1000 samples).

In relation to Hypothesis 2c, based on the full sample, results indicated that the ADHD+ target was judged significantly lower in the *other* qualities (intelligent, hardworking, trustworthy) (M: .80 < 1.11, $t_{1,133}=-5.28$, $p<.001$). An examination of the means indicates that the ADHD+ target was not judged negatively; yet ADHD disinhibition did lead to relatively lower judgments. When the same test was run on the half sample, given the order effect on this variable in the ADHD- condition, the difference was no longer significant (M: .73 \approx .87, $t_{1,65}=-1.49$, $p=.141$). This result held with bootstrap resampling as well (1000 samples).

Hypotheses 3a-b

Hypothesis 3a posited that ADHD disinhibition in a target would be positively related to perceptions of competence as an entrepreneur over other work positions for the ADHD+ target. Accordingly, paired t-tests compared perceptions of the ADHD+ target's Competence as an Entrepreneur versus as 1) an Employee, 2) a Manager, and 3) a Team Member. All three tests showed significant results. The ADHD+ target was considered to be more competent as an Entrepreneur (M: 1.05) than as an Employee (M: 0.54, $t_{1,133}=4.54$, $p<.001$), a Manager (M: 0.29, $t_{1,133}=6.50$, $p<.001$), or a Team Member (M: 0.69, $t_{1,133}=3.46$, $p=.001$). This supports Hypothesis 3a.

To assess whether these results may have been related to the target being presented as an entrepreneur, additional analyses were run. In the ADHD- condition, the target had mean absolute scores greater than 1 for all four competence items. Furthermore, the ADHD- target was assessed to be even more competent in all three non-entrepreneur positions (i.e., as an entrepreneur versus an employee, manager, or team member respectively: $t_{1,133}=2.07$, $p<.05$; $t_{1,133}=2.24$, $p<.05$; $t_{1,133}=1.71$, $p<.1$). This indicates that the relatively low assessments of the

ADHD+ target's competence in the non-entrepreneur positions were not an artifact of the target being presented as an entrepreneur.

Hypothesis 3b proposed that ADHD disinhibition in a target would be negatively related to perceptions of competence as a manager. Here, similar to the prior tests of Hypothesis 1 and Hypotheses 2a-c, the effect of ADHD disinhibition was tested by comparing the judgments of Competence as a Manager across the two ADHD disinhibition conditions (i.e., between the ADHD+ target and ADHD- target). Results of this t-test confirmed that ADHD disinhibition had an adverse effect on perceptions of managerial competence (M: $0.29 < 1.26$, $t_{1,133} = -7.58$, $p < .001$). As previously noted, an order effect appeared to influence judgments of the ADHD- target. Accordingly, the same test was run on the half sample with the ADHD- target appearing first (i.e., the half where it would be more difficult to find a significant effect). The significant results held. Judgments of Competence as a Manager for the ADHD+ target were significantly lower (M: $0.38 < 0.89$, $t_{1,65} = -2.70$, $p = .009$). This also was the case when tested with bootstrap resampling (1000 samples). Thus, the support for Hypothesis 3b appears robust.

While no hypothesis was made about the judgments of competence as an Entrepreneur between ADHD disinhibition conditions, this additional test was run. The results indicated that ADHD disinhibition did not significantly increase perceptions of competence as an Entrepreneur (ADHD+ versus ADHD- means: $1.05 \approx 1.03$, $t_{1,133} = 0.21$, $p = .88$).

Hypotheses 5a and 6a

Hypothesis 5a posited that ADHD disinhibition in a would-be founder would undermine perceptions of the likelihood of venture success. Consistent with the hypothesis, a paired sample t-test indicated significant differences in expected probabilities of venture success (0-100%) according to ADHD condition. Specifically, the ADHD+ condition led to significantly lower

assessments of success likelihood (ADHD+ versus ADHD- means: 51.6% < 58.3%, $t_{1,133}=-3.42$, $p<.001$). Comparing the two assessments, the venture in the ADHD- condition was considered 13% more likely to succeed relative to the venture in the ADHD+ condition [(58.3%-51.6%)/51.6%].

Hypothesis 6a suggested that ADHD disinhibition in a target is negatively related to other individuals' interest in joining the pursuit. This was empirically tested by comparing subjects' reported likelihood (from 0% to 100%) of accepting equivalent job offers to join the two ventures. For robustness, Hypothesis 6a was also tested by comparing subjects' reported interest (on a five-point Likert scale) of joining the two different ventures as an employee and as an intern. All three t-tests indicated that the ADHD+ condition significantly reduced interest in joining the pursuit. The mean likelihood of joining the ADHD+ venture was about 6 percentage points less than the ADHD- venture (M: 36.4% < 42.1%, $t_{1,133}=-3.27$, $p<.001$). Stated differently, subjects were 16% more likely to accept the offer to join the venture in the ADHD- condition [(36.4%-42.1%)/36.4%]. Subjects' interest in joining the pursuits as an employee or as an intern based on the Likert scales was also significantly lower in the ADHD+ condition (respectively, $t_{1,133}=-2.48$, $p=.014$; $t_{1,133}=-2.26$, $p=.025$). Notably, this negative effect was in spite of the ADHD+ target being assessed to be more *interesting*, *fun*, and *persuasive* on separate single items (respectively, $t_{1,133}=6.56$, $p<.001$; $t_{1,133}=10.71$, $p<.001$; and $t_{1,133}=2.39$, $p<.001$).

Test of ADHD Condition Effects with Repeated Measures GLM

To test the robustness of the prior results and to provide an assessment of the effect size of ADHD disinhibition (condition) accounting for repeated within-subject measures, an additional analysis was run. The analysis was a repeated measures general linear model. ADHD disinhibition was specified as the within-subject factor having two levels (ADHD+ and ADHD-).

The repeated measures corresponded to the repeated (paired) variables occurring in both the ADHD+ and ADHD- conditions.

In other words, similar to the paired-sample t-tests where the means of a particular dependent variable (e.g., interest to join the pursuit) were compared across ADHD condition, this analysis compared two dependent variable measures according to level of the within-subject factor (i.e., ADHD condition). The specification of within-subject repeated measures in the general linear model addresses the potential repeated measure concern of non-independence between a first and second measure. Table 8 shows the summary results. Table 8 also provides the calculated effect size as partial eta squared (η_p^2).

Table 8: Results of General Linear Model (GLM) Repeated Measures Analyses – ADHD Disinhibition Condition as Independent Variable (Within-Subjects)

Dependent Variable		Type III Sum of Squares	df	Mean Square	F	Significance (p)	Partial Eta Squared (η_p^2)	Observed Power ^a
Independent Variable (ADHD Disinhibition Condition)	Manipulation Check	290.6	1	290.6	261.423	<.001	0.663	1
	Interest to Interact	0.299	1	0.299	0.512	.476	0.004	0.109
	Generative Qualities	25.321	1	25.321	47.19	<.001	0.262	1
	Administrative Qualities	154.209	1	154.209	145.097	<.001	0.522	1
	Other Qualities	13.374	1	13.374	27.859	<.001	0.173	0.999
	Competence as Manager	126.119	1	126.119	57.468	<.001	0.302	1
	Expected Likelihood of Venture Success	5964.448	1	5964.448	11.679	.001	0.081	0.924
	Likelihood of Joining Venture	4413.142	1	4413.142	10.707	.001	0.075	0.901
Error	Manipulation Check	147.844	133	1.112				
	Interest to Interact	77.812	133	0.585				
	Generative Qualities	71.366	133	0.537				
	Administrative Qualities	141.353	133	1.063				
	Other Qualities	63.848	133	0.48				
	Competence as Manager	291.881	133	2.195				
	Expected Likelihood of Venture Success	67923.55	133	510.703				
	Likelihood of Joining Venture	54819.86	133	412.179				

a. Computed using alpha = .05

Consistent with results of the paired t-tests, the significance column indicates that ADHD disinhibition had a null effect on the interest to interact variable and a significant effect on all the other dependent variables. In terms of heuristics for gauging η_p^2 effect sizes: small = 0.01, medium = 0.06, and large = 0.14. Based on this, 5 of the 7 significant ADHD disinhibition effects were *large*, with a *medium* effect on the two likelihood judgments.

Other Tests and Results

In addition to the main effect hypotheses, a number of additional paths were hypothesized. Concretely, Hypothesis 4a suggested that the assessments of generative and administrative qualities were significant positive predictors of perceptions of Competence as an Entrepreneur; Hypothesis 4b suggested the assessment of administrative qualities positively predicted perceptions of Competence as a Manager; and thus these could mediate the effect of ADHD disinhibition on the two perceptions of competence. Hypothesis 5b suggested that both the judgments of Competence as an Entrepreneur and as a Manager were positively associated with the expected probability of venture success, and thus could mediate the effect of ADHD disinhibition.

Multiple regression analyses were used to test these hypotheses. A simplified path model based on the analyses is presented later this chapter, with additional figures summarizing specific path test results. Repeated measures GLMs were also used to test mediation and are discussed at the end of this chapter.

The Hypothesis 4a and 4b paths connecting generative and administrative qualities to the respective perceptions of competence were supported. However the Hypothesis 5b paths from perceptions of competence to venture success judgments were somewhat problematic. Specifically, in the ADHD+ condition, Competence as an Entrepreneur was marginally

predictive, and Competence as a Manager was not predictive, of the expected probability of venture success. However, in this condition generative and administrative judgments were both significant positive predictors of the expected probability of success. In the ADHD- condition, the expected positive connection (i.e., Hypothesis 5b) was significant, however only if the generative and administrative judgment variables were not also entered as predictors. In other words, in both conditions, what actually appeared to drive subjects' expected probability of venture success were the judgments of generative and administrative qualities and not the single-item competence judgments. Factor analyses of the generative qualities, administrative qualities, and Competence as an Entrepreneur and as a Manager items revealed a rotated two-factor solution. Item loadings showed Competence as a Manager loaded with the four administrative qualities, and that Competence as an Entrepreneur loaded with the four generative qualities.

A close examination of the factor loadings when including the two competence judgments indicates the following. First, Competence as an Entrepreneur shows relatively poor loading (.454), and Competence as a Manager also shows worse loading than the eight other items. Second, by inclusion of the two competence items, the factor loadings for almost all the other items are reduced. The item loadings are provided in the tables below.

Table 9: Rotated Factor Item Loadings, without Entrepreneur and Manager Competence Judgments

	Rotated Component Matrix ^a	
	1 (Administrative Qualities)	2 (Generative Qualities)
Consistent	.815	
Defines Steps	.805	
Reliable	.790	
Implements	.739	
Creative		.809
Visionary		.732
Recognizes Opportunity		.720
Generates Ideas		.694

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.^a

a. Rotation converged in 3 iterations.

Coefficients below |.4| not shown.

Table 10: Rotated Factor Item Loadings, including Entrepreneur and Manager Competence Judgments

	Rotated Component Matrix ^a	
	1 (Administrative Qualities)	2 (Generative Qualities)
Consistent	.799	
Reliable	.771	
Defines Steps	.767	
Implements	.719	
Competence as Manager	.690	
Creative		.772
Recognizes Opportunity		.744
Visionary		.707
Generates Ideas		.704
Competence as Entrepreneur		.454

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.^a

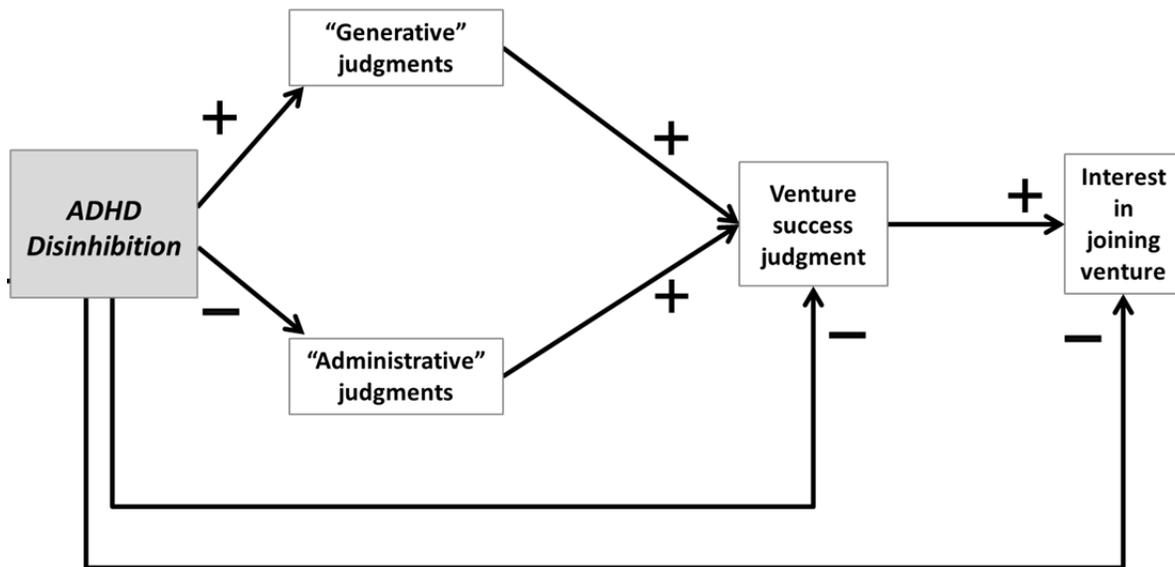
a. Rotation converged in 3 iterations.

Coefficients below |.4| not shown.

Based on these loadings, the absence of ex-ante hypotheses combining role competence judgments with the judgments of more basic qualities, and without a clear justification for combining them ex-post, the Entrepreneur and the Manager competence judgments were not integrated with overall assessments of generative and administrative qualities.

Considering the aforementioned regression and loading issues with the two competence judgments, the remainder of this section focuses on reporting the results of multiple regression analyses of a simplified model (excluding the two competence judgments). This model is illustrated below.

Figure 4: Simplified Path Model



In order to test whether the effect of ADHD disinhibition on dependent variables was mediated by the intermediary variables (e.g., by Generative and Administrative Judgments for Venture Success Judgment as a dependent variable), hierarchical modeling tested ADHD disinhibition as an incremental predictor variable. In other words, tests were run to determine whether ADHD disinhibition was a significant predictor (of judgments of venture success and of interest in joining) beyond the variables shown as more proximal.

To run such regression analyses, the ADHD disinhibition condition needed to be a predictor variable. Accordingly, unlike the prior t-tests which compared two means according to ADHD condition (i.e., between the ADHD+ condition dataset and the ADHD- dataset), the data was structured according to Order (i.e., the first stimuli/condition and the second stimuli/condition). In other words, the data was organized to reflect subject responses to the first description received (Stimuli 1) and the second description (Stimuli 2). This structuring allowed a single variable for ADHD condition.

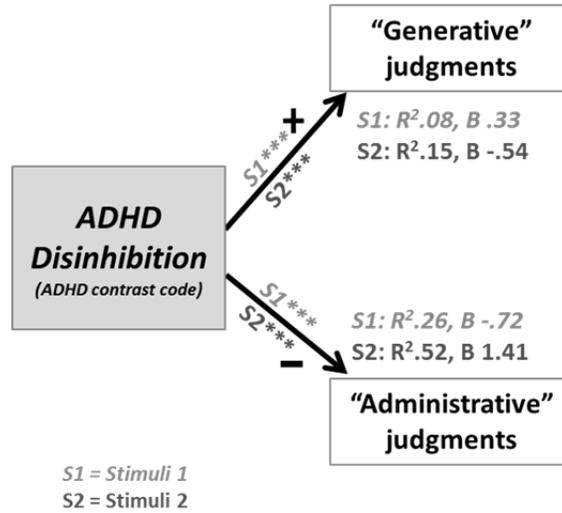
Thus, rather than comparing the difference in two judgments (according to ADHD condition, e.g., *administrative qualities*, as DV_{1ADHD+} versus DV_{2ADHD-}), regressions were run predicting one judgment as a dependent variable with ADHD condition as a predictor variable (e.g., *administrative qualities*, as $DV_{\text{FirstStimuliEvaluated}}$). This meant it was an entirely between-subjects test and only half of the data was used in the regression analyses. For robustness, equivalent regressions were run on both half datasets, corresponding to the first stimuli/condition and the second stimuli/condition.

A contrast code variable was used to capture ADHD condition between-subjects. The contrast variable reflected whether the ADHD+ condition was received first. The variable was coded 0.5 when the ADHD+ condition was first (i.e., was Stimuli 1), and -0.5 when it was not.

Before showing results of the more complicated hierarchical (multi-step) models and indirect pathways, results of single-step models testing only the straight line relationships are provided. Figures 5 through 7 below show results of regressions testing the short direct pathways indicated. Note that subjects completed the set of judgments composing the hypothesized model for both the ADHD+ and ADHD- conditions. Accordingly, the illustrated paths were tested twice based on subject data corresponding to Stimuli 1 and Stimuli 2 (representing the ADHD+ and

ADHD- conditions in a randomized order between-subjects).⁷ The significance of each direct pathway is shown according to it being tested with the data set from Stimuli 1 (S1) or Stimuli (S2). Regression R^2 s for the direct relationships are provided along with unstandardized (B) parameter estimates.

Figure 5: Path Tests based on Single Regressions



*** path significant at .001 (two-tailed).

These results indicate that the relationships are highly significant in both sets of evaluations (i.e., in the first and second stimuli/conditions). The inverted valence between the parameter estimates for Stimuli 1 and Stimuli 2 is expected based on the contrast coding. This is because when the ADHD contrast code variable is positive, Stimuli 1 judgments were about the ADHD+ target and Stimuli 2 judgments were about the ADHD- target.

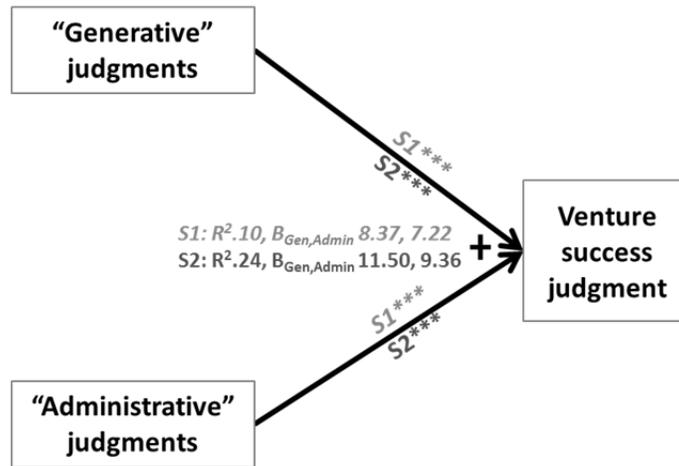
Examining the between-subjects judgments about Stimuli 1, the respective positive and negative coefficients (B=.33 and B=-.72) indicate that subjects in the ADHD+ condition rated the target of Stimuli 1 higher in generative qualities and lower in administrative qualities than

⁷ As noted, within-subject repeated measures GLMs were also run given the potential for non-independence between repeated measures.

subjects in the ADHD- condition. Similarly, when evaluating Stimuli 2, a positive ADHD contrast code variable indicated judgments were about the ADHD- target; accordingly, the flipped valence between Stimuli 1 and Stimuli 2 for the generative judgment is expected, just as it is for administrative judgment. The particularly high R^2 related to the administrative judgment in the second condition (Stimuli 2) is consistent with the partial order effect on that variable (i.e., when the ADHD- condition was received as Stimuli 2). Note that the ADHD condition R^2 s and the parameter estimates are larger in relation to the administrative qualities than the generative qualities. This suggests that ADHD has a relatively stronger negative effect on judgments of administrative qualities than it does a positive effect on judgments of generative qualities. This will be discussed further in the next chapter. Overall, these two pathways provide further support of the hypothesized main effect of disinhibition on judgments of administrative and generative qualities.

Figure 6 below summarizes the results of multiple regression analyses simultaneously testing the two paths shown. Based on the data from the first condition (Stimuli 1), the total model and the individual predictors were significant ($R^2=.10, p<.001$; $B_{\text{Generative}}=7.04, p<.01$; $B_{\text{Administrative}}=6.00, p<.01$). The same held true for the evaluations of the second condition (Stimuli 2) ($R^2=.24, p<.001$; $B_{\text{Generative}}=11.5, p<.001$; $B_{\text{Administrative}}=9.36, p<.001$).

Figure 6: Path Tests based on Multiple Regressions

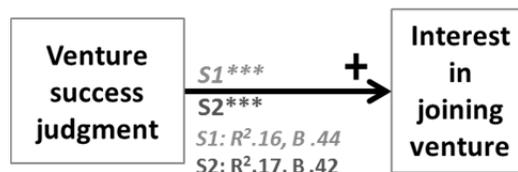


S1 = Stimuli 1
S2 = Stimuli 2

*** path significant at .001, (two-tailed).

In relation to the last direct path, Figure 7 summarizes the regression path analysis shown. The relationship was highly significant in relation to Stimuli 1 ($R^2=.16, p<.001; B=.44, p<.001$). Similarly, the relationship was highly significant with Stimuli 2 ($R^2=.17, p<.001; B=.42, p<.001$). Taken together, the results of Figures 5-7 indicate robust support for the individual direct paths. The remainder of this section presents hierarchical regression models testing additional pathways.

Figure 7: Path Test based on Single Regressions



S1 = Stimuli 1
S2 = Stimuli 2

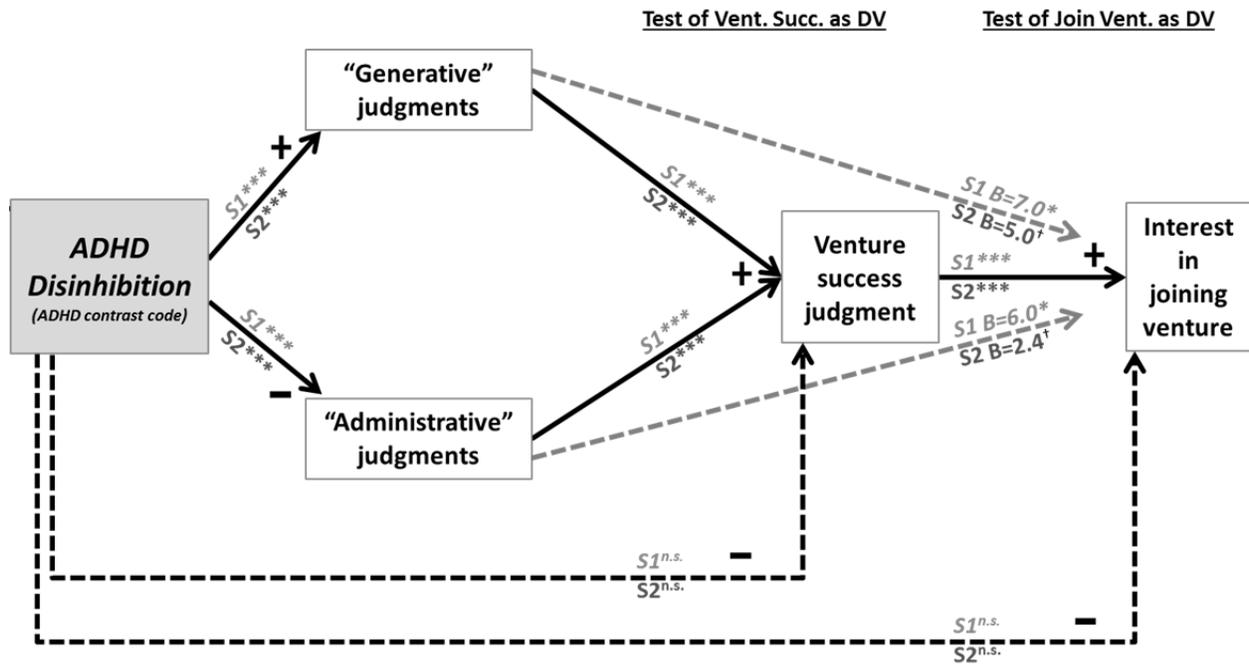
*** path significant at .001, (two-tailed).

Figure 8 below summarizes hierarchical regressions testing more than the direct (single-step) paths just discussed. The dashed lines report the significance of second or third step variables. Specifically, in predicting *judgments of venture success* as an intermediary dependent variable, the *generative* and *administrative* judgment variables were entered simultaneously as first step predictors; then the *ADHD condition* variable was entered as a second step predictor. As the figure indicates, in this two-step model, ADHD condition was not significant.

Figure 8 also shows results of hierarchical regressions predicting subjects' *interest in joining the venture*. For these tests, the *judgment of venture success likelihood* variable was entered first; then, the *generative* and *administrative* judgment variables were entered simultaneously as second step predictors. These results indicate that beyond the judgment of venture success variable, the generative and administrative judgments independently explain incremental variance in subjects' interest in joining the venture (for Stimuli 1: $\Delta R^2 = .06, p < .01$; $B_{\text{Generative}} = 7.04, p < .05$; $B_{\text{Administrative}} = 6.00, p < .05$; Stimuli 2: $\Delta R^2 = .03, p > .1$; $B_{\text{Generative}} = 5.04, p < .1$; $B_{\text{Administrative}} = 2.39, p < .1$). Since this was not hypothesized, these paths are shown with a gray dashed line. As a third step, the *ADHD condition* variable was entered. It however was not significant, in explaining incremental variance, or simultaneously with the other predictors (p statistics $> .4$).

Figure 8: Hierarchical Multiple Regression Results for Second and Third Step Variables

Dashed line = Relationship test in multiple regression models with more proximal variables.



S1= Stimuli 1
S2= Stimuli 2

*** significant at .001, ** at .01, * at .05, † at .10, n.s. not significant at .1, (two-tailed).

The absence of a significant ADHD disinhibition effect here is interesting, in light of the highly significant main effects reported in the preceding section. This difference is consistent with larger or more complicated judgments (e.g., likelihood the ADHD+ venture will be successful) being mediated by smaller judgments (e.g., the extent to which the ADHD+ entrepreneur is likely reliable, consistent, good at defining next steps, and good at implementation).

To further examine the mediation question, single regressions were run on the Stimuli 1 dataset and on the Stimuli 2 dataset, to test whether the disinhibition condition was a significant predictor of venture success and joining the venture judgments. If it were, it would be consistent with mediation. The results were mixed. ADHD condition did have a significant negative effect

on venture success judgments ($R^2=.46, p<.05$; $B=9.44, p<.05$), and a marginally significant effect on interest in joining ($R^2=.03, p<.1$; $B=7.78, p<.1$), in the half of the data from Stimuli 2.

However an effect was not found in the other half of the data (p statistics $> .3$).

While the t-tests of the prior section and the repeated measures GLM results indicate that the within-subject effect of ADHD disinhibition is significant and robust, the regression path analyses however suggest that detecting an effect of disinhibition between-subjects is challenging. This could be expected based on between-subject variance in underlying beliefs (e.g., baseline likelihood that any ventures will succeed, and baseline interest in joining any venture), empirically increasing the noise-to-signal ratio.

To directly speak to possible mediation, repeated measures GLMs were run. When not including the potential mediators, there was a highly significant effect of ADHD disinhibition on the assessments of venture success likelihood ($F_{1,133}=11.70, p=.001$) and the likelihood of joining the venture ($F_{1,133}=10.71, p=.001$). However, when the potential mediators were included in the GLM model as covariates, ADHD disinhibition was no longer significant by itself. Specifically, when including the generative and administrative assessments, ADHD disinhibition was not significant in predicting assessment of venture success ($F_{1,129}=.75, p=.39$). Similarly, ADHD disinhibition was no longer significant in predicting the likelihood of joining the venture once including the assessment of venture success likelihood ($F_{1,131}=.03, p=.87$).

In other words, in relation to Hypothesis 5b, the effect of ADHD disinhibition on assessments of venture success likelihood was conditional on the assessments of generative and administrative qualities. Also, in relation to Hypothesis 6b, the effect of ADHD disinhibition on the likelihood of joining the venture was conditional on the assessments of the likelihood of venture success. Taken together, this suggests fully mediated effects.

Chapter 5

Discussion

This chapter discusses the research findings and future research opportunities. In doing so, the first section emphasizes the findings. Then, strengths and limitations of the research are discussed. Thereafter, a few practical suggestions are offered. The chapter concludes with a short synopsis of the work and its contribution. Future research opportunities are touched on throughout the chapter.

Discussion of Findings

This dissertation sought to examine the effect of disinhibition in relation to the pursuit of opportunity. The work focused on the social psychological effect of disinhibition on entrepreneurial opportunity pursuit. Empirically, the research focused on the effect of ADHD disinhibition in an entrepreneurial target on others, at the most nascent stage of entrepreneurship – before business operations, before a firm and start-up team.

In seeking rigor and depth, the experimental findings provide a causal test of the effect of ADHD disinhibition on judgments related to the earliest social stage of opportunity pursuit. The findings are first discussed in an overall sense. More granular discussion of the results follows, organized in the order of research questions posed by the hypotheses.

Overall

The findings support the overall thesis suggested. While disinhibition may facilitate the initiation of individual entrepreneurial action (as discussed in Chapters 1 and 2), it also may impair transitioning to the social sphere (e.g., securing resources such as labor for firm formation).

The empirical research presented here provides evidence of the social sphere tension hypothesized. Overall, the findings provide evidence that would-be founders higher in ADHD disinhibition are apt to be impaired in their mobilization of resources from others, based on a net negative bias (related to ADHD disinhibition in the founder). Yet there are positive social psychological effects on others of would-be founders exhibiting ADHD disinhibition.

Hence this research uncovers an ambivalence related to ADHD disinhibition in a vocational sphere. In particular, indications of ADHD disinhibition in a potential founder do not undermine others' interest in generally interacting with the founder. On the positive side, indications of ADHD disinhibition increase assessments of potential founders' generative qualities, namely, being *creative, visionary, good at generating ideas, and good at recognizing entrepreneurial opportunities*. Similarly, ADHD disinhibition led to founders being judged to be more *interesting and fun*. Yet at the same time, indications of ADHD disinhibition undermine other assessments related to founders and associated ventures. Firstly, founder disinhibition has a negative effect on individuals' assessments of the founder's administrative qualities, i.e., being *reliable, consistent, good at defining next steps, and good at implementing ideas*. Additionally, it also has a negative effect on assessments of the founder's competence as a manager. In considering the ambivalent effects, the positive effect appears to be materially overshadowed by the negative effect.

In addition, seemingly mediated by the aforementioned, a venture is perceived as less likely to succeed when associated with a founder displaying indications of ADHD disinhibition. Finally, it appears that ADHD disinhibition in individuals pursuing opportunity has an adverse effect on engaging others in the pursuit.

These findings provide evidence that would-be founders higher in ADHD disinhibition indeed face greater difficulty in attracting the support of would-be labor or human capital. Based on the research design, it is clear that this is due to the social psychological effect on others, and not alternative causes (e.g., differences in other founder characteristics, in presentation styles, in recruitment or other business strategies, or in the opportunities pursued). Furthermore, the findings provide insight as to why (i.e., based on undermining assessments of particular founder characteristics and of venture success likelihood). Greater friction in engaging others is an important finding. The exploitation of opportunities requires others; furthermore other individuals are seemingly of even greater importance for founders who particularly need administrative or managerial support. If unable to secure supporting resources, a venture will be short-lived at best.

Potential founders higher in ADHD disinhibition might be able to offset the negative bias in various ways. This is discussed further in the Practical Considerations section near the end of this chapter. The discussion now turns to more detailed consideration of the particular social psychological effects of ADHD disinhibition.

General Social Interaction

The research findings of this dissertation indicate that perceptions of ADHD disinhibition in an entrepreneur did not have a negative effect on individuals' interest to interact generally with a potential founder. This diverges from prior findings with non-entrepreneurial targets/contexts (Paulson et al., 2005; Canu et al., 2008). It suggests that behavioral indicators of ADHD disinhibition may be somewhat more neutral in entrepreneurs, presumably based on such disinhibition being seen as relatively more normal (or expected) in entrepreneurial actors. The implication is that manifesting ADHD disinhibition does not appear to be a friction for arriving

to basic social-interaction. This matters, since general interaction is necessary for would-be founders to have any chance at engaging supporting actors.

Judgments About Potential Founders

The significant findings related to assessments of the potential founder, likelihood of venture success, and interest in joining the venture are notable. The results indicated that potential entrepreneurs who showed higher ADHD disinhibition were judged as higher in generative qualities. This indicates that by seeming more impulsive, inattentive, and hyperactive, potential founders are considered to be more creative and visionary, and better at generating ideas and recognizing opportunities.

However, indications of ADHD disinhibition in an entrepreneur also had a significant negative effect on assessments of the entrepreneur's administrative qualities. This does not mean that those higher in ADHD disinhibition are necessarily unreliable, inconsistent, poor at defining next steps, or poor at implementing ideas. It simply means that founder behavior (including verbal comments) consistent with disinhibition leads to decisively lower assessments of founders' administrative qualities.

In examining the relative positive and negative effects of ADHD disinhibition on generative and administrative assessments respectively, the negative effect is considerably larger. The size of the negative effect was twice as large in the full sample ($\eta_p^2 = .52$ versus $.26$); the negative effect was 50% larger in the more conservative half sample evaluating the higher disinhibition target first ($\eta_p^2 = .27$ versus $.18$). Similarly, the negative effect was about twice as large when looking across individuals (i.e., between-subjects, in single regression R^2 s and Bs). This suggests the *social* importance of individuals high in ADHD disinhibition working with complementary administrative others (e.g., appearing together, possibly as co-founders).

However in light of the negative effect of disinhibition on others' likelihood of joining the pursuit, the results suggest something of a *catch-22*. Namely, disinhibited founders need other individuals to appear as a (complementary) administrative/managerial resource, and presumably to provide such resources to harness the founder's innovative potential. Yet such founders face greater difficulty attracting and exogenously sourcing the complementary resource needed.

This might be further complicated by the apparent negative effect of ADHD disinhibition displays on assessments of the entrepreneur's other attributes (*intelligent, hardworking, trustworthy*). With the full sample, the entrepreneur in the ADHD+ condition was assessed to be significantly lower in these other qualities than the entrepreneur in the ADHD- condition. The similar negative trend was seen in the half sample.

That said, in both the full sample and half sample, the entrepreneur of the ADHD+ condition was rated in absolute terms positively (i.e., raw scores were above the midpoint of zero). This offers a point of comparison with the findings of Chew, Jensen, and Rosen (2009). These authors found that subjects held more negative than positive attitudes about ADHD individuals. In relation to the descriptors just discussed, *intelligent* and *trustful* were not used on average by subjects in Chew et al (2009) to describe ADHD peers, while other descriptors were (e.g., *active, loud reckless*). The results of my research indicate that subjects did consider *intelligent* and *trustworthy* to describe the ADHD+ target in absolute terms (means for these individual items were significantly above zero).⁸ Accordingly, my findings are consistent with

⁸ Note: Results at the level of specific descriptors (i.e., the different adjectives) are not shown in the published paper of Chew, Jensen, and Rosen (2009). I extend my thanks to Dr. Jensen for sharing a portion of their data that allowed my examination of specific item (descriptor) level means. Related to the comparison between my findings and those of Chew et al. (2009), there were also some similarities. In both works subjects did not consider *reliable* to describe the ADHD targets. Also, in Chew et al. (2009) *lazy* was not used describe ADHD targets, which fits with my finding of a positive endorsement of *hardworking* in an absolute sense.

ADHD disinhibition being somewhat *less* socially adverse when presented in a nascent entrepreneur – at least on judgments of non-administrative qualities.

Also related judgments about target individuals, showing higher ADHD disinhibition led to being judged to be significantly more competent as an entrepreneur than as an employee, a manager, or team member (Hypothesis 3a). In absolute terms, the positive raw values on all competence ratings suggest that a more disinhibited individual isn't necessarily expected to be incompetent in the other positions. However on the five-point scale anchored at *highly incompetent* (-2) and *highly competent* (2), mean evaluation scores on all competencies except as an entrepreneur were significantly below 1, i.e., below the point reflecting an endorsement of competence.

The finding that ADHD disinhibition had a significant and large negative effect on expectations of competence as a manager (Hypothesis 3b) is germane to entrepreneurship. In terms of nascent entrepreneurial pursuits, this also suggests the *catch-22* problem identified throughout this chapter.

The relatively low assessments of the entrepreneur in the ADHD+ condition raise the question of possible Pygmalion dynamics in the work-place, affecting individuals higher in ADHD disinhibition. If an individual is initially thought to be less competent by others, it may lead to inferior work interactions, assignments, resource provisioning and support. Especially if initial judgments of targets higher in disinhibition lead to initially more mundane task assignments, less resources, or less support for the more disinhibited actor, this would foster behavioral confirmation of an initial assessment that could have otherwise been false.

The *relative* entrepreneurial competence findings are consistent with some clinical and much popular literature suggesting that ADHD individuals may do better in self-employment

than in conventional work positions. An important caveat is the following. Due to the executive functioning challenges faced by those higher in ADHD disinhibition, to be successful without exogenous oversight or structure, it is particularly important that such individuals pursue work high in intrinsic interest and that provides ongoing feedback. Also it is important that some form of job design be used to address weaknesses (e.g., using a bookkeeper to handle certain details).

Judgments about Venture Success Likelihood, and Interest in Joining the Venture

ADHD disinhibition had a significant negative effect on the expected likelihood of venture success. Of the two ventures, the one with a more disinhibited founder was considered significantly less likely to succeed. Based on the experimental design, this indicates that expectations of whether a venture will be successful are diminished when having a founder exhibiting ADHD disinhibition.

This provides clear evidence of social bias against displays of ADHD disinhibition relevant to opportunity pursuit. It suggests that actors higher in the construct are apt to face greater difficulty mobilizing resources necessary for opportunity pursuit and exploitation. Given individuals' finite resources, would-be labor and other would-be resource providers can be expected to demonstrate a definitive preference for selecting ventures believed most likely to succeed. Considering the supply of founders and start-ups seeking resources typically exceeds slack supply of human, financial, and other resources held by would-be providers, these would-be providers can select among alternatives or remain on the sideline. The fact that ADHD disinhibition undermines estimates of the likelihood of venture success suggests that founder disinhibition does present an obstacle to advancing to social opportunity pursuit (at least without intervention).

Individuals also showed significantly less interest in joining pursuits presented by founders who were higher on ADHD disinhibition. This is in spite of the positive effect of ADHD disinhibition on assessments of founders' generative qualities. The negative effect on others' likelihood of joining was also in spite of such founders being assessed to be more *interesting, fun, and persuasive*. With individuals significantly less likely to join the entrepreneurial pursuits of those higher in ADHD disinhibition, such entrepreneurial actors indeed face an increased challenge in founding organizations.

Strengths, Limitations, and Future Research

Design

The experimental design of the research was both a strength and a limitation. Considering the randomized assignment to condition, the experimental design provided the gold standard of causal inference. This is because there was no possibility of reverse causality, nor was endogenous selection-to-condition possible. Furthermore, unmeasured or uncontrolled variables notwithstanding, the perfectly controlled randomization of the independent variable eliminated the threat of omitted variable bias and endogeneity confounds (inherent to non-experimental studies). Lastly, the experimental design eliminated the potential for results arising from common method bias. Thus it is not overstating to assert that differences in the focal independent variable caused differences in the dependent variables. Specifically, ADHD disinhibition was shown to have significant main effects on the various dependent variables. Furthermore, the size of the effects were moderate to large.

Yet any design presents trade-offs and a controlled experiment is no exception. While the information provided to subjects was crafted to resemble the mundane reality that could be expected at the most initial stage of social opportunity pursuit (e.g., at a short-pitch event or in

otherwise presenting an opportunity pursuit to a potential supporter), the information subjects received was inherently narrow. The information provided did not include visual stimuli from which inferences might be made in a natural setting (e.g., the would-be founder's attire, posture, facial and other emotive displays). This eliminated innumerable potential confounds and endogeneity issues, which would be present in a field setting.

Related to this, the design involved a unidirectional information flow, one-way to subjects. Though the described observation of the would-be founder represents the most nascent nexus (i.e., the would-be founder providing information on himself and the entrepreneurial pursuit), subjects did not have the *follow-on* option to question and directly interact with the would-be founder. This presents a limitation on how far the results can be generalized *beyond* the most nascent point of contact. In a field setting, if the would-be founder was not judged by an individual to be of sufficient interest based on his initial presentation, the possibility of follow-on questions and interacting in relation to the proposed pursuit is inconsequential. This is because if a subject was not interested in the would-be founder/pursuit, the subject would not opt to invest in follow-on questioning and interacting with the target in relation to the pursuit. Accordingly, the design provides a controlled and explicit test of the **initial** social psychological nexus of a would-be founder and others.

On a similar note, a tradeoff of the design is that it does not extend beyond the initial nexus between a would-be founder and entry-level others. The design does not examine longer chains of action or temporal effects. Another limitation relates to understanding the effect of founder disinhibition in relation to other founder characteristics. In this research, the only described/manipulated difference between the two founders was in ADHD disinhibition. This is because variance in founder characteristics other than the independent variable would have

confounded the experimental design and ability to draw causal conclusions. Hence, future research will be needed with alternative designs to illuminate the relative effect of disinhibition compared to other factors.

Data Collection and Sample

In terms of the data collection, there are a number of things to consider. Many individual perceptions and judgments are never directly observable in a natural setting (e.g., extent to which someone believes another individual to be creative). Thus primary data collection of subject judgments may be necessary. Given the complexity of human perception and decision making, myriad factors can influence such judgments. The experimental research design, with a survey style data collection instrument, ensured the independent variable was perfectly consistent across subjects. This also ensured that subsequent judgments (dependent variables) were provided in a consistent context and with consistent items. Lastly, this also eliminated the possibility of the researcher affecting the data itself (e.g., unlike if collecting interview data and the researcher was not blind to condition, or the possibility of bias unintentionally influencing the coding of qualitative information). In sum, the design and data collection methodology isolated the effect of the independent variable on the dependent variables.

The electronic administration of the data collection allowed true randomization of the experimental manipulation, without indication of manipulation to subjects. All subjects received the equivalent instrument, with the landing screen and all other screens identical; the software randomized the appearance of the experimental manipulation in presenting Stimuli 1 and Stimuli 2. Also, the electronic administration eliminated the potential for missing data and for multiple responses to the same item. The electronic instrument also allowed the unobtrusive collection of additional data used to screen for careless responding. The administration of the instrument

through Qualtrics ensured that the instrument was only available to individuals of the specified sample. This means that the data collected do not include responses by individuals outside the business student population. Finally, the electronic administration eliminated the possibility of errors in data coding/entry by the researcher. Thus the electronic data collection was a strength, within the bounds of the design.

The sample used in the research is both a strength and a limitation. The sample of business students represents business oriented individuals at a relatively entry-level, and potential white-collar human capital. As potential recruits, such individuals are much more affordable than more experienced professionals, particularly for the potential founder yet to arrive to external financing stages. Additionally, such individuals are apt to be easily accessible to would-be founders (e.g., as peers if the aspiring founder is still at university, through university entrepreneurship classes and centers, or at university hosted pitch events). For would-be founders high in ADHD disinhibition, as Orfalea and Marsh suggest (2005), the greatest need is for someone who can help keep the founder organized and focused, and to follow-through on the mundane but important details. Another factor making business students attractive recruits for would-be founders is a differential capacity to provide alternative incentives/compensation over established firms (i.e., incentives that cost the founder little or nothing). This is discussed further with the practical considerations. Nonetheless, business students represent only a slice of the potential individuals whose perceptions and judgments are germane to early-stage entrepreneurial pursuits.

Generalizability

Based on the research hypotheses and design, there is no reason why the sizable and highly significant relationships found should not generalize to other samples and populations. Generally speaking, a strength of lab experiments is that the underlying relationships are likely to apply to other people (because of randomization) in other contexts (because of the artificiality of the laboratory context). ... [The design] helps to uncover general relationships rather than idiosyncratic ones resulting from 'noisy' or unmeasured factors present in the field (Chatman & Flynn, 2005: 437).

In relation to this research in particular, I am not aware of any theoretical reason why the negative effects of ADHD disinhibition should not generalize to the broader population of business undergraduates, or older, more experienced, and more conservative populations. The positive effects on assessments of generative qualities however might be less stable in older subject populations; I suggest this given the potential for stronger biases against ADHD disinhibition based on tendencies for people to become more conservative with age or the possibility of adverse vocational experiences with individuals high in ADHD disinhibition. If the potential founder of the ADHD+ condition showed a more extreme level of disinhibition (and corollary factors) associated with a definitive clinical ADHD diagnosis, the negative effects could be expected to be even stronger.

Given the design and the stage of existing knowledge, the research provides a strong but general test of the hypothesized relationships. In other words, the results offer a focused examination of the social psychological effect of ADHD disinhibition in relation to early-stage nascent entrepreneurial pursuits. The research offers a strong causal test of the presence and valance of the general relationships hypothesized. The research however is limited in its ability to provide meaningful insight into generalizable means or parameter estimates. Thus serious

caution should be used in any consideration of means or coefficients beyond the context of the reported results. Ultimately, future research will be needed to determine exactly *how* or *how much* disinhibition affects social psychological judgments and associated outcomes. The research presented here provides a first step; this work suggests future research can be fruitful based on the moderate-to-large effect sizes uncovered.

In relation to the importance of social psychological judgments in nascent entrepreneurship, indeed perceptions or internal judgments are of less interest to policy makers and macro-level theory than *yet-to-occur* (or *not occur*) individual and firm behavior (e.g., acquisition of human or financial capital in relation to firm survival and performance). However, the ultimate micro-foundations of later individual and firm behavior (and outcomes) are earlier unobservable psychological phenomena; individual perceptions and judgments are drivers of important individual behaviors (e.g., whether to support a venture with one's human or financial capital). More generally, the underpinnings of molar-phenomena are micro-phenomena. The collection of in-the-moment judgments, related to potential founders at the beginning of the entrepreneurial process, had two benefits. Not only did it avoid the issue of survivor bias in founders, but it also eliminated the threat of post-hoc bias in individuals' judgments. If the research had sampled individuals with ex-post knowledge of a founder or venture, it would be unknown the degree to which bias is present and its effects. In relation to subjects' reported likelihood of accepting an offer to join the venture, this reflects a behavioral intention. While the coupling between behavioral intentions and subsequent behavior is not perfect, intentions are an established predictor and mediator of ultimate behavior. In sum, the data collected and empirical results serve as a well-controlled first step upon which future research can build.

Subsequent research opportunities include examining further connections between disinhibition and opportunity pursuit. For example, is level of disinhibition connected to recognition and pursuit of certain types of opportunities? Are individuals higher in more or less successful at pursuing particular types of opportunities? Are the effects of disinhibition affected by aspects of the opportunity pursuit (e.g., industry or proposed business model)? What is the effect of disinhibition on teams, turn-over, or firm-level outcomes? Considering the negative effect on resource acquisition suggested by the findings, is this effect offset (or exacerbated) over time by other disinhibition effects? In relation to the final question, if the ecological odds of resource acquisition from a particular individual are 50% lower for a more disinhibited actor, the negative effect of disinhibition could be reduced, nullified, or even overshadowed if the actor is apt and able to make a significantly greater number of attempts at acquisition (e.g., given hyperactivity and less overall inhibition).

Overall future research is needed, incorporating not just other variables and populations, but using longitudinal designs. Longitudinal research will be necessary in order to see how the effects of disinhibition in founders play out in relation to the acquisition of resources in the field, advancing (or not) in the entrepreneurial process, and eventual firm performance and survival.

Synopsis

Considering the psychology and entrepreneur literatures (including popular press and case studies), abductive reasoning and the state of existing literature suggested merit in the experimental method used. A causal connection was uncovered, with founder disinhibition undermining individuals' judgments of whether a venture will be successful and interest in joining a venture. This is in spite of a positive causal association with such founders being believed to be more *creative* and *visionary*, better at *generating ideas* and *recognizing*

entrepreneurial opportunities. The negative effect on interest in joining the pursuit was also in spite of such founders being considered more *interesting* and *fun*, characteristics of relatively greater importance to the average 20-year-old than the average older worker and other resource provider. With potential founders higher in ADHD disinhibition facing greater friction with less-experienced entry-level labor, more experienced resource providers of various types would also be less likely to believe the pursuit will be successful and contribute to it. This suggests that field studies starting with founders are apt to suffer from winner's bias at least in part related to ADHD disinhibition. Accordingly, a logical next step in understanding the effect of disinhibition on nascent entrepreneurial pursuit would be quasi-experimental and longitudinal research that is able to capture would-be founders, their effect on would-be resource providers, and eventual founding or abandonment outcomes. Considering the threat of winner's bias, a longitudinal approach could start by measuring disinhibition in business students and then tracking the transitions and activities of those who pass through subsequent stages of becoming would-be founders, and founders, on through to ultimate firm-level outcomes when applicable.

Armed with the findings of the research reported here, future field research should seek to illuminate differences in actions and outcomes of according to disinhibition levels. Considering a basic two-by-two matrix of with disinhibition (high/low) on one axis, and founding (successful/unsuccessful) on the other, what are the key behavioral differences that uniquely separate the successful high in disinhibition? Thereafter, more complicated research should examine how varying levels of disinhibition affects entrepreneurial action and outcomes.

Practical Considerations

This research suggests various possible recommendations for practice and policy. Among these are the following.

Individuals high in ADHD disinhibition should be careful to regulate their social sphere behavior to limit the suggestion of high disinhibition when presenting an entrepreneurial pursuit. The outward indication of disinhibition had adverse effects on social assessments. The overall size and number of negative effects on social judgments clearly eclipsed the positive. In terms of behavioral regulation, clinical and popular literature already advise interventions for individuals high in ADHD; such interventions include things as simple as using a daily planner, frequent vigorous exercise, meditation, and requiring a 24-hour waiting period before making any significant decisions (e.g., large purchases). Such interventions can also take the form of environmental manipulation (e.g., reducing the number of potential distractors in the workspace) or procedural structures (e.g., consulting or even requiring the signoff of a trusted someone on significant decisions).

Many interventions would not be germane to the particular context of this research (i.e., the initial social nexus of entrepreneurial opportunity pursuit). However some could be effective, such as scheduling exercise or an energetic walk before key social situations. Furthermore, existing psychology literature has shown that general self-regulatory capacities can be strengthened (Vohs & Baumeister, 2010); this suggests that training or other interventions occurring in one context that increase *self-regulatory muscle or reserve* could be leveraged in another context. Applied research could test self-regulatory and structural interventions to assess which are more or less effective for nascent entrepreneurs.

Another possibility for would-be founders higher in ADHD disinhibition might be to acknowledge others' negative biases about personal qualities when pitching the opportunity pursuit, to avoid the apparent follow-on negative effect on assessments of venture success likelihood and interest in joining. For example, this might be done by the founder noting that he

is well aware that administrative qualities are not where his greatest strengths lie, and for that reason, he will not be in a manager role. Such a founder might continue-on to include that a co-founder serves as a prudent administrator (or such a person will be brought in), and that the would-be hire will be provided considerable latitude to self-manage and will have the authority to manage details for (and aspects of) the founder as appropriate.

While future research will be needed to test whether the above would be effective in addressing negative biases, it is plausible. It can be inferred generally from social psychology research suggesting that biases can be mitigated, and more specifically from later-stage entrepreneurial phenomena. Specifically, at later stages in the nascent entrepreneurial process, founders of VC financed firms are frequently replaced by professional managers (Fund, 2012). An emerging literature on founder transitions and discussions with VCs suggests that a founder outwardly acknowledging he is probably not the professional manager needed in the future has a positive effect on VCs and ultimate value creation (Fund, Foo, & Heckman, 2013). Applied to my inquiry and findings, this simply suggests the potential fruitfulness of future research examining ways to address disinhibition biases related to opportunity pursuit.

Founders higher in ADHD disinhibition might also seek to offset the negative bias by providing superior tangible or intangible incentives. Realistically, providing greater financial compensation would likely put the venture at a competitive disadvantage and increase the burn rate, shorting the runway to launch and profitability (i.e., the amount of time available to reach positive cash-flow and net income). Providing greater non-financial compensation would be a better option, yet doing so would be imitable by other founders (i.e., those lower in ADHD disinhibition) seeking similar resources. Nonetheless, offering generous non-financial

compensation may be effective since employment offers and details at new ventures are non-public and highly idiosyncratic.

In relation to this, nascent founders can offer incentives costing them little or nothing, which established firms would be relatively less able to provide and/or would likely serve better in attracting young talent. Nascent founders and start-ups have relatively greater flexibility than established firms. More disinhibited founders can and should use their creativity and flexibility to create, customize, and deliver non-financial incentives to potential employees – particularly when considering young talent, where the start-up can likely receive relatively greater implicit pricing of incentives involving greater risk/reward.

Such incentives could be something as simple as superior job titles. It could also be in the form of rapid mobility, experience not possible at established firms (e.g., access to senior-level strategic decision making), or simply work or industry experience required by established firms and lacked by fresh university graduates. It could also be in the form of thrill-seeking/excitement, with the potential to *make it big* and of *total firm-failure* never far away – something better suited for the psychological profile of the average 22-year-old than increasingly older individuals. It could also be compensation primarily in the form of profit-sharing and stock-options (versus salary and health insurance benefits), which are relatively likely to be worthless and less suited for the financial obligations and risk-profile of the average older worker.

In sum, would-be founders higher in ADHD disinhibition might overcome the bias against joining their pursuit by providing extra incentives. Considering would-be founders' and nascent firms' relative flexibility and limited financial resources, focusing on non-financial incentives would be critical.

One other potential practical implication is that would-be founders higher in ADHD disinhibition should organize their activities and cash-flows to allow extra time for securing necessary resources. By appreciating that it may take more attempts and more time to get the needed support, such nascent founders would be wise to budget time and expenditures accordingly. Concurrently, any nascent founders must bear in mind that a strategy of quickly making a lot of attempts, at an expense to quality, is not the solution. A founder only has one chance to make a first impression; local resource stocks are finite; and the start-up community, particularly in a geographic area or industry, is often a surprisingly small world. Furthermore, unlike established firms, non-local search and action is severely restricted by the very limited financial, knowledge, and attentional resources held by a founder or nascent start-up. Thus, those higher in disinhibition should ensure professionalism in their social interactions and prepare accordingly.

Overall, like any individual with various strengths and weaknesses, entrepreneurial actors high in disinhibition need others to ultimately exploit opportunity. While disinhibition may provide a well-spring of entrepreneurial ideas and the behavioral impetus to act on such ideas, engaging complementary others is particularly key as disinhibition interferes with sustained attention to mundane detail (important for ultimate entrepreneurial success). Accordingly, whether the entrepreneurial potential and behavior of more unfettered individuals is effectively harnessed depends on overcoming apparent social biases against disinhibition. This is no small matter since entrepreneurial action is the source of new ventures and ultimately of value creation for founders, employees, stake-holders, and the broader economy and society.

In relation to policy, there are various possible implications. Policies and programs designed to foster and incubate entrepreneurship might be more effective if considering

disinhibition. For example, there may already be an abundance of more disinhibited individuals pursuing entrepreneurial opportunities and struggling to get traction. To harness their potential value creation, education and programs that develop or directly provide administrative support would be key. Concretely, tax incentives, start-up grants, and incubatory office-space may be less critical than presumed in incentivizing a supply of would-be founders; while such interventions offer economic support, they do not develop would-be founders *executive* or administrative capacities, nor do they provide related exogenous (to the individual) support/resources. Thus such policies miss the critical aspect of training or otherwise supporting administrative implementation capabilities. The success of start-up mentoring programs suggests that direct non-financial support of early-stage business founders is possible and fruitful. Such mentoring might be enhanced by considering founder disinhibition, for example, counseling to bring in a complementary co-founder or administrator early on. Programs that provide direct administrative support are also possible; this might be something as simple as a providing a few hours of week of such labor or even a fractional office administrator. Particularly in regions or countries with high unemployment or displaced government employees (e.g., furloughed staff or tenured public servants), such labor might be readily available.

While the findings suggest that indications of founder disinhibition may have a deleterious effect on the founder's ability to marshal critical resources, the extent to which this constitutes a policy challenge does present a question for future consideration. For example, one interpretation of the findings is that less-favorable, or even unfavorable, perceptions towards founder disinhibition on the part of potential employees, investors, or other resource providers is evidence of a functioning market. Given the odds against new venture survival under even munificent conditions, firms founded by individuals with relative weakness in implementation

may indeed find themselves seriously disadvantaged in the competitive marketplace. If unregulated disinhibition disposes disadvantage in entrepreneurial implementation, then lower interest by resource markets (e.g., labor and capital) would be consistent with lower operational performance or survival prospects.

In other words, presuming higher disinhibition is on-average associated with implementation competitive disadvantage, one interpretation of findings is that the complete “package” of founder and his or her business concepts is rationally priced at a discount (relative to the mean value accorded new ventures by the sum total of market-based perceptions). If this is the case, disinhibition-tinged stigmas are fundamentally rational and thus beyond the scope of conventional policy. It would thus be incumbent upon founders exhibiting the characteristics of disinhibition to make behavioral adjustments, recruit complementary resources as part of a founding team and embark upon a process of learning how best to conjoin the founder’s innovation with indispensable market-based labor and capital resources. Therefore, while the implications of a disinhibition stigma may have societal-level impacts, there is reason for debate and future research as to whether the impacts can be meaningfully addressed through broad policy initiatives. Successful founders exhibiting disinhibition may well have been selected by the marketplace based on their individual capacity to regulate and time the qualities that appear to trigger adverse judgments.

Related to even broader vocational and social policy, entrepreneurial programs could be offered as a way to productively channel behavior of individuals and groups higher in disinhibition that are not already pursuing (legal) entrepreneurial opportunities. Legitimate entrepreneurial action offers a much more constructive form of thrill-seeking risk behavior than alternatives linked to various forms of disinhibition – e.g., illegal or destructive entrepreneurship

(Lerner & Hunt, 2012; Hmieleski & Lerner, 2013), work-place deviance (Diefendorff & Mehta, 2007), or substance abuse (Sher & Trull, 1994). Entrepreneurial programs could be targeted to at-risk or incarcerated populations, which have been shown to have substantially higher rates of clinical disinhibition disorders (Gordon & Moore, 2005; Coolidge et al., 2009), high entrepreneurial aptitude (Sonfield, Lussier, & Barbato, 2001), interest in entrepreneurship and disdain for available jobs (Fairlie, 2002). Thus for society as well as for individuals, channeled entrepreneurial behavior is a healthier source of stimulation and a means to constructively focus attention, hyperactivity, appetitive drive and impulsivity, creative proclivities, and other aspects related to disinhibition.

Conclusion

Drawing on established yet currently unconnected literature, this work explored uncharted territory. In doing so, it contributes to both psychological and entrepreneurial literatures. In relation to the psychological sciences, it provides a vocationally contextualized examination of disinhibition. In relation to entrepreneurship, it contributes insight into the social psychology of nascent entrepreneurial pursuit. In connection to other work noted in Chapter 2 (e.g., Lerner, 2010; 2011; 2012; Lerner & Hunt, 2012), it contributes to a developing disinhibition perspective of entrepreneurial action.

Subsequent research is needed to ascertain the effect of disinhibition throughout the entrepreneurial process, particularly in relation to other psychological variables, contextual factors, and eventual strategic outcomes. The potential contribution of this dissertation and future research is not limited to the aforementioned literatures. As one example, the tension presented by disinhibition in new venture creation is similar to that existing organizations face in strategic opportunity pursuit, behavioral strategy (Gavetti, 2012), and managing exploration/exploitation.

Within organizations, just as outside of them, individuals higher in disinhibition (more unfettered cognitively and behaviorally) are apt to possess greater capacities to explore, perceive distant opportunities, and initiate pursuit. Yet if negative biases prevail against such individuals and their ideas/pursuits, without some type of intervention the potential may at best be squandered. At worst, such individuals will have to bear the personal cost of deviance from the status quo and will learn to keep quiet (or energetically defend inertia). This reduces the opportunity for organizational learning and innovation. The cost to the organization may be even higher if the individual leaves the firm, especially if leaving to pursue the opportunity as a competitor (i.e., as an unsponsored spinoff). In any case, without intervention, individuals, organizations, and society are apt to bear the cost of the disinhibition paradox in one way or another.

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