

IMPULSIVITY AND ENTREPRENEURSHIP: CAN A NEGATIVE TRAIT PRODUCE POSITIVE RESULTS?

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ABSTRACT

Self-control is the capacity to override an impulse and to respond appropriately. Entrepreneurs must exercise the self-discipline required to undertake innovative actions. This paper offers a self-control technique called pre-commitment agreements in which individuals freely make decisions that are intended to bind or constrain themselves in the future. Such directives are often referred to as “Ulysses contracts” after Homer’s story of Ulysses who commanded his crew to fasten him to the mast of his ship and ignore him should he beg to be released after hearing the songs of the Sirens. Sometimes, however, adaptive traits such as self-control have a dark side, and dark traits such as impulsivity have a bright side. We explore this paradox by examining the relationship between entrepreneurship and attention-deficit/hyperactivity disorder (ADHD).

INTRODUCTION

“You are very lucky. You are blessed with an extraordinarily powerful mind. You have the equivalent of a Ferrari engine for a brain. That’s why you are a major winner in the making, a potential champion. But you must address one major problem. You have the brakes of a bicycle; you have difficulty controlling the power of your brain. Sometimes it runs away with you, so you may crash into walls or fail to slow down or stop when you should. This can cost you the race.”

—Ned Hallowell (2014)

Self-control touches on nearly all aspects of healthy living: eating right, exercising, avoiding drugs and alcohol, studying more, working harder, spending less. Self-control is another name for managing and changing the self (Baumeister, 2015) and is often used to alter responses such as modifying one’s thoughts, emotions, task performance, or impulses. According to Baumeister and Tierney (2011), most of the problems that plague modern Americans—addiction, overeating, crime, domestic violence, prejudice, transmitted diseases, debt, unwanted pregnancy, educational failure, poor performance at work and school, lack of savings, failure to exercise—have some degree of self-control failure as a central aspect.

The words in the epigraph by psychiatrist Ned Hallowell directed to entrepreneurs suggest that self-control issues may be problematic for them. Indeed, Kets de Vries (1985) and Soutschek et al. (2017) have indicated that self-control deficiencies are dysfunctional. Self-control is essential for startup intentions to develop into concrete activities and that the higher the level of self-control, the more likely it is for a person intending to become an entrepreneur to do so (van Gelderen, Kautonen, & Fink, 2015). The ability to maintain control means that emotions are less likely to

cloud their judgment which is critical as doubt, fear, and aversion are common feelings that can come into play when building an enterprise.

Given that self-control appears to be particularly important for entrepreneurs, this paper examines how such individuals may exercise self-control using what is called a precommitment strategy—an approach in which people bind or attempt to restrict beforehand, their future behavior and set of options. First, a discussion of self-control is presented followed by a review of the precommitment method, and then how a protocol can be implemented. The paper then examines how self-management, while desirable, in general, may have problematic consequences for some entrepreneurs. The article closes with a summary of recent research suggesting that entrepreneurs with attention-deficit/hyperactivity disorder (ADHD), often associated with individuals thought to be impulsive and lacking in self-control, may be beneficial.

SELF-CONTROL

Self-control is one of the defining qualities that distinguish human beings from other species (Fujita, 2011). Self-control is defined as the ability of individuals to alter their states and responses, including exerting control over thoughts, emotions, impulses, desires, and performance (Carver & Scheier, 1982; Metcalfe & Mischel, 1999; Tangney, Baumeister, & Boone, 2004). Many also consider self-control to be the deliberate, conscious, and effortful subset of self-regulation that is central to people's ability to get along with others, and achieve goals that may require sacrifices (Baumeister, Vohs, & Tice, 2007), as is the case with starting a new business venture.

Self-control involves an individual's capacity to alter or override dominant response tendencies and to regulate behavior, thoughts, and emotions (Bandura, 1989; Metcalfe & Mischel, 1999; Rothbaum, Weisz, & Snyder, 1982). Researchers often use different labels (e.g., willpower, self-discipline, self-management, impulse control, impulsiveness control, delay of gratification, inhibitory control, conscientiousness, self-regulation, affect regulation, behavior regulation, desire regulation, effortful control, coping, thought control) to refer to ostensibly similar processes. Although substantive differences distinguish some of these constructs, they are all relevant to the concept of self-control.

Low self-control has been associated with risky and deviant behavior (Vazsonyi, Pickering, Junger, & Hessing, 2001), procrastination (Steel, 2007), criminal behavior (Burton, Evans, Cullen, Olivares & Dunaway, 1999), and some psychiatric disorders including addiction and obesity (Stutzer & Meier, 2015). High self-control individuals, by contrast, are better able to control their thoughts, regulate their emotions, and inhibit their impulses better than low self-control people (Baumeister, Bratslavsky, Muraven, & Tice, 1998), and can focus on strategic goals instead of seeking instant gratification of their needs. Concentrating on the long-term, sticking to a plan, and not getting distracted might be keys to better performance. Therefore, this trait promotes desirable behavior and inhibits undesirable conduct (De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012).

Mischel and other colleagues (e. g., Mischel, Shoda, & Peak, 1988; Shoda, Mischel, & Peake, 1990) showed that children at the age of 4 or 5 who could resist one marshmallow immediately for two marshmallows in the future (e. g., 15-minutes) showed greater academic success, better ability to plan, enhanced ability to deal with frustration and stress, and increased

social competence ten years later, compared to the children that were not able to wait. This suggests that individuals better in controlling their impulses will be able to persist in a task and stick to a planning event when tempting distractions are at hand. Wolfe and Johnson (1995) found that self-control was the only one of 32 personality variables that contributed significantly to the prediction of the grade point average of university students. Additionally, Tangen et al. (2004) found that self-control predicted many positive outcomes including interpersonal success, school achievement, adjustment, and emotional stability. A study by Hofmann, Luhmann, Fisher, Vohs, and Baumeister (2014) also positively linked self-control to life satisfaction. Moreover, these effects were linear suggesting that higher levels of self-control the more beneficial were such outcomes. Moffitt et al. (2011) likewise found that there does not appear to be a level of self-control beyond which no more benefits are received.

HARNESSING SELF-CONTROL

Because the subjective value of a reward declines as the delay to its receipt increases (Kalenscher & Pennartz, 2008), people are often tempted toward choosing small immediate rewards over larger delayed ones, even when such choices are clearly against their best interests. Developing self-control usually involves preventing short-term temptations from upsetting long-term goals and can be implemented in various ways. In the battle for self-regulation, two techniques have often been used to combat low self-control: willpower and precommitment.

Willpower

Willpower is very important and has been characteristic of humans since Adam and Eve lost paradise. For many, self-control entails the exertion of willpower—the inhibition of impulses when presented with immediate temptations. The classical self-management dilemma implies a battle between a proverbial angel on one shoulder and a devil on the other. Considerable research on self-control has focused on the ability to resist tempting impulses through willpower (also known as “delay of gratification”; Metcalfe & Mischel, 1999; Muraven & Baumeister, 2000); that is, the ability to inhibit an impulsive response that nullifies one’s commitment (e.g., to bypass dessert or to forgo tobacco). People can frequently successfully resist temptations even from a very young age (Mischel et al., 1989) and research indicates that the regular practice (interspersed with rest) of small acts of inhibiting moods, urges, thoughts or feelings could increase self-control strength (Muraven, Baumeister, & Tice, 1999). This increased strength should generalize to all tasks that require self-control. Hence, the specific self-control task practiced is unimportant, providing it requires the individual to override or inhibit a response. However, willpower is far from invincible. Research has shown that willpower can be disrupted by emotions and is less successful during “hot” emotion-linked states and it falters when persons are tired or stressed, and can be depleted over time (Loewenstein & O’Donoghue, 2004; Metcalfe & Mischel, 1999; Muraven & Baumeister, 2000).

Research also suggests that attempting to overcome temptation with willpower alone may prove futile, therefore a problematic strategy (e.g., Muraven & Baumeister, 2000; Wegner, 2009). Inhibition is a reactive self-control strategy, engaged *after* a temptation impulse is already

activated and must be restrained. Fortunately, individuals can deploy alternative self-control strategies like precommitment, the voluntary restriction of access to impending temptations. This approach more *proactively* engages potential conflicts and is less susceptible to exhaustion.

Pre-commitment

While most research on self-control has focused on the ability to resist temptation impulses through willpower (Soutschek et al., 2017), evidence indicates that pre-commitment represents a valid alternative that enables humans to make binding choices and thereby avoid impulse control failures in many situations of everyday life (Fujita, 2011; Kalenscher & Pennartz, 2008). Taking away a future choice from oneself to avoid anticipated willpower failures is referred to as pre-commitment (Kurth-Nelson & Redish, 2012; Soutschek et al., 2017). Pre-commitment can be an effective tool to help people follow through on decisions by making it harder for their future self to succumb to temptation. Pre-commitment behaviors can involve many forms, ranging from purely external mechanisms like flushing cigarettes down the toilet, making a promise to oneself that one is unwilling to break, to activities like making a public statement about one's intentions. Precommitment is ubiquitous in human behavior.

Possibly the earliest example of pre-commitment is cited in *The Odyssey* (Homer, 800 B. C. E.) in which Ulysses ordered his seamen to plug their ears with wax and bind him to the mast, so that, no matter how tempting the Sirens' song, it would be impossible for him to cast himself into the sea. Pre-commitment is also known as a Ulysses pact or Ulysses contract and is a freely made decision that is intended to bind oneself in the future. Consider too the Spanish explorer and conquistador, Hernán Cortés, who in 1519, in his quest to conquer the Aztec Empire of Mexico and plunder their riches, gave the order to burn his own ships to eliminate any future means of desertion or any thought of retreat—and to ensure his men were wholly committed to his mission and quest for riches. While Cortés undoubtedly increased the risk to his own life and that of his men, the removal of possible escape brought out the very best of the fighting spirit in his men, leading to dramatic victories. The option of failure was gone because there was no choice, no fallback—conquer as heroes or die. Incredibly, they succeeded in this unlikely defeat of a much larger foe (Wagorn, 2014). The ships were sunk and by doing this, the level of commitment of the men was raised to an extreme degree. The path forward was clear for everyone to see—all or nothing; 100% commitment.

More recent examples of pre-commitment contracts or Ulysses pacts involve the use of advance directives which are legal documents that permit a person to spell out their decisions about end-of-life care ahead of time and to express their wishes to family, friends, and healthcare professionals to avoid confusion later. Other less dramatic examples of binding behaviors, include people placing their alarm clock out of our reach so they will have to get out of the warm bed in the morning, positioning ice cream out of sight, putting money into a retirement account with withdrawal penalties, walking a different way to avoid seeing a store where they could be tempted to buy something, frequenting health retreats where some foods are not permitted, saving in non-interest-bearing Christmas clubs, or buying small packages of cigarettes to limit consumption (Wertenbroch, 1998). Schelling (1992) provided an extreme example in which drug addicts would send self-incriminating letters to an individual they fear the most will find out about their addiction

if there was a relapse into drug use. Russians also have a treatment for alcoholism known as the Dovzhenko method, after a Russian psychiatrist (Finn, 2005), that involves a precommitment contract. The arrangement invites alcoholics to agree to have a small pill implanted underneath their skin, which contains the chemical Disulfiram that has the effect of causing an array of horrible symptoms to those who consume even a trivial amount of alcohol while the treatment is active. In Australia, Canada, and Norway many gambling devices require the gambler to pre-set a limit on his or her bets, after which the slot machine deactivates (Ladouceur, Blaszczynski, & Lalande, 2012).

What characterizes binding behavior is the voluntary imposition of constraints (that are costly to overcome) on one's future decisions in a strategic attempt to resist future enticements and impulses. At its core, precommitment is an accountability system between an individual's future self and their present self to resist temptation. It gives people a way to incentivize their future self into making the best choice when faced with "hot" situations, which Metcalf and Mischel (1999) describe as the "basis of emotionality, fears, as well as passions—impulsive and reflexive—[that], undermines efforts at self-control" (p. 3). A cool system is "cognitive, emotionally neutral, contemplative, flexible, integrated, coherent, spatiotemporal, slow, episodic, and strategic" (p. 3) and the seat of self-regulation and self-control. According to Schelling (1992), there exists a farsighted and cool self that can anticipate that its myopic, impulsive twin will not resist, for example, a drink at a party. Therefore, the future self-increases the costs of consuming alcohol by pre-committing to abstinence; it swallows the drug Antabuse that causes vomiting upon consuming alcohol.

Furthermore, studies by Crockett and her collaborators (e.g., Crockett et al., 2013; Soutschek et al., 2017) found that precommitment was superior to willpower in enhancing self-control. It was more reliable than willpower, actively preserves it for later use when it may be needed, and helps everyone, especially the people with impulse control, make better decisions. In the Crockett et al. (2013) study these researchers presented volunteers with a choice: they could have a small reward immediately or a larger reward for a delay. In the willpower test, the volunteers had to use the strength of will to resist choosing the small reward while they waited for the more significant outcome. But in the pre-commitment condition, they had the option to "pre-commit" to the more substantial prize and thus removing the possibility of choosing the inferior small reward while they waited. Pre-commitment turned out to be the winning strategy. When participants were given the opportunity to pre-commit, they were more likely to wait for the larger reward as opposed to relying on willpower alone. Moreover, the benefits of pre-commitment were most evident for those with the worst willpower. After examining participant's brain scans, they found that simply giving people the option to pre-commit activated their brain's reward network. Enhancing precommitment, therefore, has the potential to increase individual and societal well-being in many respects, especially for impulsive agents (Kurth-Nelson & Redish, 2012), such as entrepreneurs.

IMPLEMENTING A PRE-COMMITMENT STRATEGY

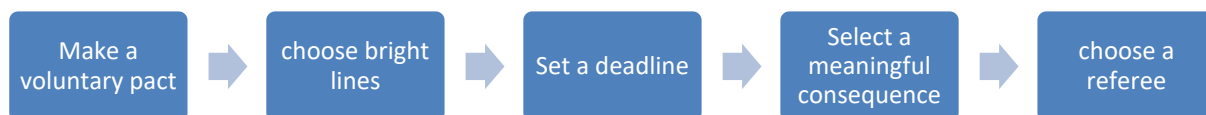
Thus, it seems that precommitment contracts have considerable merit. Two studies suggest some principles that should be considered when developing such an agreement. John, Norris, and

Norton (2014) reported that people who drew up a contract in stickK.com (n. d.; a company that enables users to undertake commitment bonds or promises that they will do something [lose weight, quit smoking, etc.] to reach their personal goals) without stakes was 42.7 percent effective; and with money at risk, it was 82.8 percent successful. If the money was going to a charity the user disliked, the success rate was even higher, 87.1 percent. And the persons who risked more than one hundred dollars did better than those who chanced less than twenty dollars.

Other clues for creating pre-commitment pacts can be garnered from Giné, Karlan, and Zinman (2010). These economists randomly offered some Philippine smokers a precommitment contract with a bank which would give them a weekly opportunity to deposit money into an account paying no interest. Smokers were encouraged to put the amount of money ordinarily spent on cigarettes in the bank, but the level was strictly voluntary—each week they could contribute as much as they wanted, or nothing at all. At the end of six months, the people would submit to a urine test. If the analysis found any nicotine in their body, they would forfeit all the money in the account. Compared to a control group offered a different stop-smoking program, the smokers offered a pre-commitment contract were nearly 40 percent more likely to be nicotine-free after a year. “What began as a pre-commitment turned into something permanent and more valuable: a habit” (Baumeister & Tierney, 2011, p. 154).

These studies offer a blueprint that can contribute to the effectiveness of a pre-commitment contract. At its core, pre-commitment is an accountability system between an individual’s future self and their present self to resist temptation. As can be seen below in Figure 1, many of these principles are consistent with goal setting theory (Locke & Latham, 2002):

Figure 1. The Pre-commitment contract



The important first step in the pre-commitment contract is to make it a voluntary pact. In fact, all acts of self-control must, at some point in time, have been self-initiated (Duckworth et al., 2017; Wood, Labrecque, Lin, & Rüniger, 2014). Most of the popular theories of self-regulation focus on personal/self-set/voluntary (as opposed to assigned) goals as the most direct determinant of behavior. For example, control theory (Carver & Scheier, 1982), goal theory (Locke, Latham, Smith, & Wood, 1990), and self-efficacy (Bandura, 1989) all recognize the importance of self-set goals and argue that assigned goals affect performance only through affecting one’s personal goals. Second self-set person goals can affect one’s commitment. For example, Tubbs and Dahl (1991) argued that the discrepancy between one’s own goal and an assigned goal was an accurate measure of commitment to the assigned objective and that this discrepancy measure was strongly related to performance. Research by Wright, Hollenbeck, Walz, and McMahan (1995) found that personal self-set goals were accurate predictors of performance. In addition, Erez, Gopher, and Arzil (1990) found self-set goals led to the highest performance levels.

The second step in the pre-commitment agreement calls for bright lines. Bright lines are a metaphor for clear, simple, unambiguous rules (goals) that help self-control. A bright line is specific and measurable. It simplifies decision making and shapes behavior. People cannot help but notice when they cross a bright line (Baumeister & Tierney, 2011). Bright lines allow no room for interpretation, no space for arguing over ambiguity. The choice a person faces is clear: either they follow the rule, or they do not; without any degree of flexibility. For example, an individual who promises himself or herself to drink or smoke “moderately” has not established a bright line, but rather a vague boundary with no obvious point at which an individual goes from moderation to excess. Because the transition is so gradual and the human mind is so adept at overlooking its failings, individuals may not notice when they have gone too far. The unconscious mind works best with clear, explicit, unequivocal rules and plans. Too much ambiguity exists when following the rule, for instance, to drink temperately. Conversely, zero tolerance is a bright line: total abstinence with no exceptions anytime. Examples of bright lines in business could include “I will return all customer calls within 24 hours,” or “I will have a one-on-one talk with each direct report each week.”

In step three, choosing a deadline, researchers recommend that a person starts with something small and doable. Thirty days may be long enough to establish a habit and not highly difficult to achieve. A short agreement could last for 30-60 days. This timeframe suggests a small win’s approach (Soper, Von Bergen & Sanders, 1996; Weick, 1984) in which the scale with which people think about problems affect their ability to solve them. A small win’s approach appears less formidable than more comprehensive change tactics and mobilizes action rather than producing perceptions of helplessness by focusing on more local, immediate, and achievable goals. A small success builds on concrete, complete, implemented outcome of moderate importance. As an example, rather than wiring one’s jaws shut to prevent overeating one might consider less drastic measures such as dieting or exercise programs before considering surgery or other extreme action.

Perhaps the most successful individual change initiative ever developed is based on a small win’s approach. One rule that Alcoholics Anonymous uses is: “don’t have a drink today” (Kaskutas, 2009, p. 147). By having the alcoholic’s mind focus on simply getting through “today,” the task becomes more attainable and achievable. It may not be effortless, but it can be accomplished. When an alcoholic makes it through one day, that day becomes a small win for him or her. They often obtain a sense of accomplishment and begin to feel confident that they can make it through another day, then another, and perhaps a month, six months, or even an entire year or lifetime without having a drink.

Step four of the pre-commitment contract requires that something of value be at stake. Some suggest that it should be significant to the individual. The emphasis on aversive outcomes in many precommitment strategies appears to be consistent with prospect theory research which indicates that individuals are more motivated to avoid a loss than to gain or, as cognitive scientists Tversky and Kahneman (1991) reported, “losses loom larger than corresponding gains” (p. 1047). In other words, bad is more potent than good (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). Moreover, individuals tend to feel a loss about twice as severely as they experience gain (Schurenberg, n. d.). More formally, loss aversion is the notion that the disutility experienced from a loss is greater than the utility felt from a gain of the same magnitude; for instance, the thought

of losing \$100.00 is more impactful (motivating) than the idea of gaining \$100.00. The greater impact of negatively framed incentives is also predicted by the negativity bias which finds that people are *less* motivated when an incentive is framed to accrue a gain as compared with when the same incentive that is framed to avoid a loss (Goldsmith & Dhar, 2013).

Finally, individuals should select someone who will hold the precommitment maker accountable and not free them from the obligation they established. Perhaps a family member, a best friend, or someone similar could act as a referee. Increasingly, however, websites like stickK.com (n. d.) can fulfill the role of human referees. For individuals who find it hard to resist online websites like Facebook and YouTube, tools such as SelfControl (n. d.) will temporarily block a person's access to distracting websites so that s/he can work on the things that matter. RescueTime (n. d.) gives an individual an accurate picture of how they spend their time to help them become more productive every day. Similarly, Covenant Eyes (n. d.) is an accountability software program that tracks an individual's web browsing and then emails a list of the sites the person visited anyone the individual designated in advance—like their boss or spouse. To assist dieters some individuals publicly post their weight every week on Facebook or Twitter and potentially humiliate themselves before friends, family, ex-spouses, church members, and co-workers who view these posts.

SELF-CONTROL, IMPULSIVITY, AND ENTREPRENEURIAL ADHD

The very nature of self-control entails overriding some impulses and desires. Often there can be severe, pervasive, and discernable risks to those acting impulsively. To counteract these effects, precommitment contracts can assist entrepreneurs to enhance their self-control. An accumulating body of indicators has depicted that the effects of exercising self-control may be detrimental and harmful (Baumeister & Alquist, 2009). For example, Zabelina, Robinson, and Anicha (2007) found that high self-control dampens affective responding and that individuals high in self-management were perceived as less spontaneous and extraverted than individuals low in self-control. Similarly, Alquist, Ainsworth, Baumeister, Daly, and Stillman (2015) showed that individuals described the most self-controlled person they knew as significantly less open to experiences than the least self-controlled person they identified. Interestingly, however, traits such as spontaneity, extraversion, and openness to experience characterize effective entrepreneurs (Zhao & Seibert, 2006) suggesting the counterintuitive idea that successful entrepreneurs may be low in self-control.

Individuals low in self-control acted impulsively—without much thought and based on what they are currently feeling. Impulsivity has commonly been considered a negative trait that often leads to problems in life (e.g., Nelson & Birkimer, 1978), but research by Dickman (1990) has found two kinds of impulsiveness. Functional impulsivity is a tendency to make quick decisions when optimal and beneficial ("I benefit from unexpected opportunities where I have to do something immediately or lose my chance"). This impulsivity is in contrast to dysfunctional impulsivity, which is a tendency to make quick decisions when not optimal ("Often I don't spend enough time thinking about a situation before I act"). Although both types of impulsiveness can be associated with inaccurate results, functional impulsivity is often considered a positive because it can help individuals take full advantage of opportunities. Increased activity, adventurousness,

enthusiasm, and extraversion (Smillie & Jackson, 2006) are characteristic of functional impulsivity because such individuals are shown to have enhanced executive functioning overall (Perez, Sanchez de Leon, Mota, Luque, & Garcia, 2012). In contrast, dysfunctional impulsivity is said to be more closely linked with problem behaviors, as this type of activity equates with negative consequences for the individual. For example, disorderliness, poor appraisal of facts, and lack of concern for the results of actions were indicative of people exhibiting the dysfunctional style of impulsivity (Morgan & Norris, 2010). Dickman's (1990) findings illustrate an important issue often overlooked—not all impulsive behavior is problematic. Indeed, one might wonder how obviously impulsive patterns of behavior have remained intact through evolutionary history if they are as pathological as is sometimes depicted. Such a viewpoint is consistent with Evenden (1999) who discussed varieties of impulsivity.

An important factor which separates functional from dysfunctional impulsiveness is the difference in ability to inhibit competing and contradictory pieces of information that are detrimental to individuals' decision making. Specifically, those high in functional impulsivity benefitted from increased information processing (for most tasks), whereas those more inclined to dysfunctional impulsivity were poor at excluding the competing and often contradictory information which often leads to adverse outcomes (Brunas-Wagstaff, Bergquist, Morgan, & Wagstaff, 1996). Additionally, impulsive behaviors are at the core of an ADHD diagnosis which is often defined by three primary symptoms: inattentiveness, hyperactivity, and impulsivity (American Psychiatric Association, 2013). While the attention deficit symptom is not beneficial, the hyperactivity and the impulsivity symptoms are helpful. The advantage of hyperactivity involves work capacity because it enables individuals with ADHD to focus and work day and night. Individuals with the disorder also tend to be hyper-focused risk-takers, which makes them ideal entrepreneurs. ADHD traits might lead entrepreneurs to focus intently on tasks such as building their dream company. Entrepreneurs and individuals with ADHD are both commonly risk-takers who seize opportunities. The benefit of impulsivity symptom is an action orientation. In entrepreneurship, people must act.

Many personal accounts of a relationship between ADHD symptoms and entrepreneurship can be found in the literature. The popular press, such as *The New York Times* and *USA Today*, has highlighted many examples of entrepreneurs who claim to have benefited from their diagnosed or presumed ADHD while successfully creating and developing their companies (Turner, 2003). Prominent examples include David Neeleman (JetBlue airlines), Sir Richard Branson (Virgin), Paul Orfalea (Kinko's, now FedEx Office), and Ingvar Kamprad (Ikea). Furthermore, ADHD symptoms have been related to entrepreneurial characteristics, including opportunity recognition and innovative achievement (White & Shah, 2011), risk-taking (Mäntylä, Still, Gullberg, & DelMissier, 2012), action orientation (Flach, 1997), and entrepreneurial intentions (Verheul et al., 2015). Likewise, Thurik, Khedhaouria, Torrès, and Verheul (2016) found evidence (in their sample of 306 French small firm owners) of a link between ADHD symptoms and entrepreneurial orientation, which is known to be a crucial antecedent of entrepreneurial success of small firm survival and growth (Wiklund, Patzelt, & Shepherd, 2009). Similarly, Wiklund and associates (e.g., Wiklund, Patzelt, & Dimov, 2016; Wiklund, Yu, Tucker, & Marino, 2017) found ADHD to be characteristic of some entrepreneurs.

ADHD symptoms, particularly impulsivity, then, can be viewed as a personal trait with both functional (i.e., desirable) and dysfunctional (i.e., undesirable) features that can impact entrepreneurial achievement (Judge, Piccolo, & Kosalka, 2009). Impulsivity (dysfunctional impulsivity) may compromise entrepreneurial effectiveness in general but may also enhance productivity and success (functional impulsivity) in specific situations (e. g. impulsive entrepreneurs may take control of ambiguous conditions due to their willingness to take risks; Judge et al., 2009).

It should be noted that precommitment strategies can be advantageous regardless of whether high or low levels of self-control may be beneficial to entrepreneurs. In part, this is because of the proactive nature of precommitment agreements. Duckworth et al. (2017) observed that as a general rule early intervention to activate self-control is best. For instance, quick response, when the impulse to eat donuts is still budding, is wiser than waiting until the desire has grown so high that Herculean efforts are required to make a healthier choice. Regarding his hot temper, Montaigne (1580/2003) considered it better to intervene proactively, rather than procrastinate: “The infancies of all things are feeble and weak. We must keep our eyes open at their beginnings” (p. 1154; for similar arguments, see Hofmann & Kotabe, 2012; Sheppes & Gross, 2011). Because temptations tend to grow stronger over time, precommitment strategies “can nip a tempting impulse in the bud” (Duckworth, 2016, p. 35) making them especially useful in preventing undesirable action.

CONCLUSION

“Self-control is another name for changing ourselves” (Baumeister, 2015, p. 60) and research abounds confirming the benefits of self-control. Self-controlled individuals have deep-rooted “good” habits (e.g., to study, exercise, eat healthfully), and these practices in turn help describe the benefits of self-control for positive life outcomes (Galla & Duckworth, 2015). As suggested here, precommitment contracts/Ulysses pacts consist of self-imposed, present-day costs or restrictions that are aimed at enhancing one's welfare in the future and are used as a mechanism for overcoming (dysfunctional) impulsivity and exercising self-control (Kurth-Nelson & Redish, 2012). Such traits are needed by entrepreneurs and are posited to be the engine of success and essential psychological attributes that foster achievement at work and play—and in overcoming life's hardships (Baumeister, 2015; Baumeister & Tierney, 2011; Mischel, 2015).

While self-control for entrepreneurs is desirable in general, there may be circumstances where low levels of self-control (i.e., impulsiveness) may be helpful even though in the clinical literature, impulsivity has been shown to be a transdiagnostic feature of many forms of psychopathology (Johnson, Carver, & Joormann, 2013). It may be that the dark trait of impulsivity potentially has a bright side for entrepreneurs because individuals with ADHD (in which impulsivity is a distinguishing feature) have symptoms that coincide with innovativeness, risk-taking behavior, and proactiveness, which can contribute to entrepreneurs’ successful pursuit of their ambition (Verheul et al., 2015). Thus, it may be helpful to create an appropriate environment in which individuals with ADHD symptoms can exploit their particular gifts (Biederman et al., 2005). Entrepreneurs have multifaceted personalities, with positive traits potentially having a dark side, and dark traits, such as impulsivity, possibly having a bright side (Judge et al., 2009).

Future research could explore the relative efficacy of different self-control strategies in different contexts. Additionally, the relationship between ADHD and entrepreneurship needs further study, especially how different problems entrepreneurs encounter are impacted by impulsivity and self-control. Also, the constructs of functional and dysfunctional self-control within the entrepreneurial setting seem like a fruitful avenue for further research. Finally, tests for curvilinearity should be explored more thoroughly because of the inconsistent findings regarding the effectiveness (or ineffectiveness) of high levels of self-control for entrepreneurs and other occupational specialties.

REFERENCES

- Alquist, J. L., Ainsworth, S. E., Baumeister, R. F., Daly, M., & Stillman, T. F. (2015). The making of might-have-beens: Effects of free will belief on counterfactual thinking. *Personality and Social Psychology Bulletin, 41*(2), 268-283.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*, 1175-1184.
- Baumeister, R. F. (2015). Self-control: The secret to life's successes. *Scientific American, 312*(4), 60-65.
- Baumeister, R. F., & Alquist, J. L. (2009). Is there a downside to good self-control? *Self and Identity, 8*, 115-130.
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5*, 323-370.
- Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality & Social Psychology, 74*, 1252-1265.
- Baumeister, R. F., & Tierney, J. (2011). *Willpower*. New York: The Penguin Press.
- Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science, 16*(6), 351-355.
- Biederman, J., Mick, E., Fried, R., Alardi, M., Potter, A., & Herzig, K. (2005). A simulated workplace experience for nonmedicated adults with and without ADHD. *Psychiatric Services, 56*, 1617-1620.
- Brunas-Wagstaff, J., Bergquist, A., Morgan, K., & Wagstaff, G. F. (1996). Impulsivity, interference on perceptual tasks and hypothesis testing. *Journal of Personality and Individual Differences, 20*, 471-482.
- Burton, V. S., Evans, T. D., Cullen, F. T., Olivares, K. M., & Dunaway, R. G. (1999). Age, self-control, and adults' offending behaviors: A research note assessing a general theory of crime. *Journal of Criminal Justice, 27*(1), 45-54.
- Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality—social, clinical, and health psychology. *Psychological Bulletin, 92*, 111-135.
- Covenant Eyes. (n. d.). Retrieved at <http://www.covenanteyes.com/>
- Crockett, M. J., Braams, B. R., Clark, L., Tobler, P. N., Robbins, T. W., & Kalenscher, T. (2013). Restricting temptations: Neural mechanisms of precommitment. *Neuron, 79*(2), 391-401.
- De Ridder, D., Lensvelt-Mulders, G., Finkenauer, C., Stok, F. M., & Baumeister, R. F. (2012). Taking stock of self-control: A meta-analysis of how self-control affects a wide range of behaviors. *Personality and Social Psychological Review, 16*(1), 76-99.
- Dickman, S. J. (1990). Functional and dysfunctional impulsivity: Personality and cognitive correlates. *Journal of Personality and Social Psychology, 58*, 95-102.
- Duckworth, A. L., Gendler, T. S., & Gross, J. J. (2017). Situational strategies for self-control. *Perspectives in Psychological Science, 11*(1), 35-55.
- Erez, M., Gopher, D., & Arzil, N. (1990). Effects of goal difficulty, self-set goals, and monetary rewards on dual task performance. *Organizational Behavior and Human Decision Processes, 47*(2), 247-269.
- Evenden, J. L. (1999). Varieties of impulsivity. *Psychopharmacology, 146*, 348-361.

- Finn, P. (2005, October 2). *Russia's 1-Step Program: Scaring Alcoholics Dry*. *Washington Post*. Retrieved from <http://www.washingtonpost.com/wpdyn/content/article/2005/10/01/AR20051001011196.html>
- Flach, F. (1997). Disorders of the pathways involved in the creative process. In M. A. Runco & R. Richards (Eds.), *Eminent creativity, everyday creativity and health* (pp. 815-831). London: Ablex Publishing Corporation.
- Fujita, K. (2011). On conceptualizing self-control as more than the effortful inhibition of impulses. *Personality and Social Psychology Review*, 15(4), 352-366.
- Galla, B. M., & Duckworth, A. L. (2015). More than resisting temptation: Beneficial habits mediate the relationship between self-control and positive life outcomes. *Journal of Personality and Social Psychology*, 109, 508-525.
- Giné, X., Karlan, D., & Zinman, J. (2010). Put your money where your butt is: A commitment contract for smoking cessation. *American Economic Journal: Applied Economics*, 2, 213- 235.
- Goldsmith, K., & Dhar, R. (2013). Negativity bias and task motivation: Testing the effectiveness of positively versus negatively framed incentives. *Journal of Experimental Psychology: Applied*, 19(4), 358-366.
- Hallowell, N. (2014). *Do All Entrepreneurs Have ADHD?* Retrieved from <http://www.success.com/article/do-all-entrepreneurs-have-adhd>
- Hofmann, W., & Kotabe, H. A. (2012). General model of preventive and interventive self-control. *Social and Personality Psychology Compass*, 6(10), 707-722.
- Hofmann, W., Luhmann, M., Fisher, R. R., Vohs, K. D., & Baumeister, R. F. (2014). Yes, but are they happy? Effects of trait self-control on affective well-being and life satisfaction. *Journal of Personality*, 82(4), 265-177.
- Homer. (800 B. C. E.; Butler, S. 1994). *The Odyssey*. Retrieved from <http://classics.mit.edu/Homer/odyssey.html>
- John, L. K., Norris, M., & Norton, M. I. (2014). Making stickK stick: The business of behavioral economics. *Harvard Business School Case Study*. Retrieved from <https://hbr.org/product/making-stickk-stick-the-business-of-behavioral-economics/an/514019-PDF-ENG>
- Johnson, S. L., Carver, C. S., & Joormann, J. (2013). Impulsive responses to emotion as a transdiagnostic vulnerability to internalizing and externalizing symptoms. *Journal of Affective Disorders*, 150(3), 872-878.
- Judge, T. A., Piccolo, R. F., & Kosalka, T. (2009). The bright and dark sides of leader traits: A review and theoretical extension of the leader trait paradigm. *Leadership Quarterly*, 20, 855-875.
- Kalenscher, T., & Pennartz, C. M. (2008). Is a bird in the hand worth two in the future? The neuroeconomics of intertemporal decision-making. *Program in Neurobiology*, 84(3), 284-315.
- Kaskutas, L. A. (2009). Alcoholics anonymous effectiveness: Faith meets science. *Journal of Addictive Disorders*, 28(2), 145-157.
- Kets de Vries, M. F. R. (1985). The dark side of entrepreneurship. *Harvard Business Review*, 63(6), 160-167.
- Kurth-Nelson, Z., & Redish, A. D. (2012). Don't let me do that!—Models of precommitment. *Frontiers in Neuroscience*, 6, 138-145.
- Ladouceur, R., Blaszczynski, A., & Lalande, D. R. (2012). Pre-commitment in gambling: A review of the empirical evidence. *International Gambling Studies*, 12(2), 215-230.
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57(9), 705-717.
- Locke, E. A., Latham, G. P., Smith, K. J., & Wood, R. E. (1990). *A theory of goal setting & task Performance*. Upper Saddle River, NJ: Prentice Hall.
- Loewenstein, G., & O'Donoghue, T. (2004). *Animal Spirits: Affective and Deliberative Processes in Economic Behavior*. Retrieved from <https://pdfs.semanticscholar.org/14f8/bad98f95fb3da3b00ae34811539a7abb7360.pdf>
- Mäntylä, T., Still, J., Gullberg, S., & Del Missier, F. (2012). Decision making in adults with ADHD. *Journal of Attention Disorders*, 16, 164-173.
- Metcalf, J., & Mischel, W. (1999). A hot/cool system analysis of delay of gratification: Dynamics of willpower. *Psychological Review*, 106, 3-19.
- Mischel, W. (2015). *The marshmallow test: Why self-control is the engine of success*. New York: Back Bay Books.
- Mischel, W., Shoda Y., & Peake P. K. (1988). The nature of adolescent competencies predicted by preschool delay of gratification. *Journal of Personality and Social Psychology*, 54, 687-696.

- Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R., Harrington, H. L., Houts, R., Poulton, R., Roberts, B., Ross, S., Sears, M., Thomson, W. M., & Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, *108*, 2693-2698.
- Montaigne, M. (1580/2003) (Screech, M. A., Ed.). *The complete essays*. New York: Penguin Group.
- Morgan, K., & Norris, G. (2010). An exploration into the relevance of Dickman's functional and dysfunctional impulsivity dichotomy for understanding ADHD-type behaviors. *Individual Differences Research*, *8*(1), 34-44.
- Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin*, *126*(2), 247-259.
- Muraven, M., Baumeister, R. F., & Tice, D. M. (1999). Longitudinal improvement of self-regulation through practice: Building self-control strength through repeated exercise. *Journal of Social Psychology*, *139*(4), 446-458.
- Nelson, W., & Birkimer, J. (1978). Role of self-instruction and self-reinforcement in the modification of impulsivity. *Journal of Consulting and Clinical Psychology*, *46*, 183.
- Perez, E. J. P., Sanchez de Leon, J. M. R., Mota, G. R., Luque, M. L., & Garcia, C. P. (2012). Caracterización neuropsicológica de la impulsividad funcional y disfuncional en adictos a sustancias: Implicaciones clínicas. [Neuropsychological characterization of functional and dysfunctional impulsivity in drug addicts: clinical implications]. *Addicciones* (Abstract) (in Spanish), *24*(1), 51-58.
- Rescue Time. (n. d.). Retrieved at <https://www.rescuetime.com/>
- Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality & Social Psychology*, *42*, 5-37.
- Self Control. (n. d.). Retrieved at <https://selfcontrolapp.com/>
- Schelling, T. (1992). Self-command: A new discipline. In J. Elster & G. F. Loewenstein (Eds.), *Choice over time* (pp. 167-176). New York: Russell Sage Foundation.
- Schurenberg, E. (n. d.). *Your Irrational Fear of Loss and How It Messes with Your Decisions*. Retrieved from <https://www.inc.com/daniel-kahneman/idea-lab-daniel-kahneman-the-endowment-effect.html>
- Sheppes, G., & Gross, J. J. (2011). Is timing everything? Temporal considerations in emotion regulation. *Personality and Social Psychology Review*, *15*(4), 319-331.
- Shoda, Y., Mischel, W., Peake, P. K., (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification: Identifying diagnostic conditions. *Developmental Psychology*, *26*, 978-986.
- Smillie, L. D., & Jackson, C. J. (2006). Functional impulsivity and reinforcement sensitivity theory. *Journal of Personality*, *74*(1), 1-37.
- Soper, B., Von Bergen, C. W., & Sanders, C. (1996). Small wins and organizational development. *International Association of Management Journal*, *8*, 44-50.
- Soutschek, A., Ugazio, G., Crockett, M. J., Ruff, C. C., Kalenscher, T., & Philippe N., & Tobler, P. N. (2017). Binding oneself to the mast: stimulating frontopolar cortex enhances precommitment. *Social Cognitive and Affective Neuroscience*, *12*(4), 635-642.
- Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, *133*, 65-94.
- stickK.com. (n. d.). Retrieved at <http://www.stickK.com/>
- Stutzer, A., & Meier, A. N. (2015). Limited self-control, obesity, and the loss of happiness. *Health Economics*, *25*(11), 1409-1424.
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, *72*, 271-324.
- Thurik, R., Khedhaouria, A., Torrès, O., & Verheul, I. (2016). ADHD symptoms and entrepreneurial orientation of small firm owners. *Applied Psychology: An International Review*, *65*(3), 568-586.
- Tubbs, M. E., & Dahl, J. G. (1991). An empirical comparison of self-report and discrepancy measures of goal commitment. *Journal of Applied Psychology*, *76*, 708-716.
- Turner, R. (2003, 23 November). *Executive Life; In Learning Hurdles, Lessons for Success*. Retrieved from *The New York Times* at <http://www.nytimes.com/2003/11/23/business/executive-life-in-learning-hurdles-lessons-for-success.html>

- Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics*, 106(4), 1039-1061.
- van Gelderen, M., Kautonen, T., & Fink, M. (2015). From entrepreneurial intentions to actions: Self-control and action-related doubt, fear, and aversion. *Journal of Business Venturing*, 30(5), 655-673.
- Vazsonyi, A. T., Pickering, L. E., Junger, M., & Hessing, D. (2001). An empirical test of a general theory of crime: A four-nation comparative study of self-control and the prediction of deviance. *Journal of Research in Crime and Delinquency*, 38, 91-131.
- Verheul, I., Block, J., Burmeister-Lamp, K., Thurik, R., Tiemeier, H., & Turturea, R. (2015). ADHD-like behavior and entrepreneurial intentions. *Small Business Economics*, 45(1), 85-101.
- Wagorn, P. (2014). *Burn the ships*. Retrieved from <https://www.ideaconnection.com/blog/2014/04/open-innovation-commitment/>
- Wegner, D. M. (2009). How to think, say, or do precisely the worst thing for any occasion. *Science*, 325(5936), 48-50.
- Weick, K. (1984). Small wins: Redefining the scale of social problems. *American Psychologist*, 39, 40-49.
- Wertenbroch, K. (1998). Consumption self-control by rationing purchase quantities of virtue and vice. *Marketing Science*, 17(4), 317-337.
- White, H. A., & Shah, P. (2011). Creative style and achievement in adults with attention-deficit/hyperactivity disorder. *Personality and Individual Differences*, 50, 673-677.
- Wiklund, J., Patzelt, H., & Dimov, D. (2016). Entrepreneurship and psychological disorders: How ADHD can be productively harnessed. *Journal of Business Venturing Insights*, 6, 14-20.
- Wiklund, J., Patzelt, H., & Shepherd, D. A. (2009). Building an integrative model of small business growth. *Small Business Economics*, 32, 351-374.
- Wiklund, J., Yu, W., Tucker, R., & Marino, L. D. (2017). ADHD, impulsivity and entrepreneurship. *Journal of Business Venturing*, 32(6), 627-656.
- Wolfe, R. N., & Johnson, S. D. (1995). Personality as a predictor of college performance. *Educational & Psychological Measurement*, 55, 177-185.
- Wood, W., Labrecque, J. S., Lin, P.-Y., & Rüniger, D. (2014). Habits in dual process models. In J. Sherman, B. Gawronski, & Y. Trope (Editors). *Dual process theories of the social mind* (pp. 371-385). New York, NY: Guilford Publications.
- Wright, P. M., Hollenbeck, J., Walz, P., & McMahan, G. (1995). Effects of varying operationalizations of goal difficulty on goal setting outcomes and processes. *Organizational Behavior and Human Performance*, 61, 28-43.
- Zabelina, D. L., Robinson, M. D., & Anicha, C. L. (2007). The psychological tradeoffs of self-control: A multi-method investigation. *Personality and Individual Differences*, 43, 463-473.
- Zhao, H., & Seibert, S. E. (2006). The big five personality dimensions and entrepreneurial status: A meta-analytical review. *Journal of Applied Psychology*, 91(2), 259-271