

**THE SLEEP TRAP: DO SLEEP PROBLEMS PROMPT ENTREPRENEURIAL  
MOTIVES BUT UNDERMINE ENTREPRENEURIAL MEANS?**

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The current symposium emphasizes that mental health conditions can influence a person's entrepreneurial motives and means. The current paper suggests that sleep plays an important role in both relationships. With respect to entrepreneurial motives, I draw from sleep research to suggest that sleep problems may increase entrepreneurial motives by prompting many of the same behaviors as clinical ADHD, and by precipitating and/or mediating the effect of several mental health conditions including depression. With respect to entrepreneurial means, however, I draw from the same research to suggest that sleep problems are likely to undermine several abilities important for the successful founding of an entrepreneurial venture (alertness, creativity, and social competence). Thus, despite facilitating the desire to become an entrepreneur, sleep problems may undermine entrepreneurs' ability to thrive as an entrepreneur. Overall, the current paper explores the three-way relationship between sleep, mental health, and entrepreneurship, focusing on the important influence of sleep problems on entrepreneurial motives and means. The conclusions both integrate existing research and pave the way for new research on the role of sleep in entrepreneurship.

**Key words:** entrepreneurship, entrepreneurial motives, entrepreneurial means, sleep, mental health

## INTRODUCTION

Modern society suffers from increasingly insufficient and low-quality sleep (National Institute for Occupational Safety and Health [NIOSH], 2004): Each of the last several decades has seen a five-minute reduction in average sleep duration (Kronholm et al., 2008). Today, about 30% of American citizens and over 40% of businesspeople sleep less than six hours a day (Luckhaupt, Tak, & Calvert, 2010), compared to the recommended seven to nine (Hirshkowitz et al., 2015). Accordingly, 29% of Americans report extreme fatigue or falling asleep at work (Swanson et al., 2011). These problems are hardly confined to the U.S., as indicated by sleep studies conducted in Britain, Finland, Korea, and Sweden (Groeger, Zijlstra, & Dijk, 2004; Park et al., 2010; Salminen et al., 2010; Westerlund et al., 2008).

Sleep problems carry important implications for organizations, costing the U.S. economy alone an estimated \$150 billion per year in accidents and lost productivity (NIOSH, 2004). In addition, inadequate sleep quantity and/or quality have been linked to organizational consequences like deviance (Christian & Ellis, 2011), abusive supervision (Barnes, Lucianetti, Bhave, Christian, 2015b), unethical behavior (Barnes, Schaubroeck, Huth, & Ghumman, 2011), cyberloafing (Wagner, Barnes, Lim, & Ferris, 2012), prejudice (Ghumann and Barnes, 2013), dissatisfaction (Scott & Judge, 2006), absenteeism (Westerlund et al., 2008), and a decrease in charismatic leadership (Barnes, Guarana, Nauman, & Kong, 2016). Sleep problems clearly matter for organizations (Barnes, 2012), and the management literature has recently seen a surge of interest in the topic (e.g., Barnes, Guarana, Nauman, & Kong, 2016; Barnes et al., 2015b; Christian & Ellis, 2011; Barnes, 2012). To the best of my knowledge, however, research has not yet considered the effect of sleep problems on entrepreneurship, the focus of the current paper.

### **Overview of the Current Paper**

In this paper, I argue that the effects of sleep problems on entrepreneurship parallel and operate in tandem with the effects of mental health on entrepreneurship. Accumulating evidence suggests that entrepreneurship and mental health are interrelated (e.g., Fink, Rauch, Hatak, & Baranyi, 2017). In particular, the evidence is beginning to suggest that mental health conditions may influence people's entrepreneurial motives (desire to become an entrepreneur) and means (ability to thrive as an entrepreneur; McMullen & Dimov, 2013). Synthesizing a diverse body of evidence and building on a recent interest in physical health and entrepreneurship (Fink et al., 2016), the current paper contends that sleep problems—defined as poor sleep quality and/or an insufficient sleep quantity (Barnes, 2012)—may play a critical role in both of these relationships. Figure 1 details the relationships in the current research.

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With respect to entrepreneurial motives, I draw from physiological research on sleep to suggest that sleep problems may prompt many of the same behavioral tendencies as clinical attention deficit hyperactivity disorder (ADHD). Given accumulating evidence that ADHD and its behavioral particular tendencies contribute to entrepreneurial motives (e.g., Dimic & Orlov, 2014; Lerner, 2016; Verheul et al., 2015), I argue that sleep problems may contribute to entrepreneurial motives in a parallel fashion (relationship #1 in Figure 1). In addition, I draw from psychological research on sleep and mental health (e.g., Gunia, Sipos, LoPresti, & Adler, 2015; Seelig et al., 2010; Wright et al., 2011) to argue that sleep problems may precipitate and/or mediate the effect of several mental health conditions, including depression, on people's desire to become entrepreneurs (relationships #2-3 in Figure 1). In brief, and through several paths, sleep problems may prompt entrepreneurial motives.

With respect to entrepreneurial means (relationship #4 in Figure 1), however, I review sleep research suggesting that sleep problems may undermine several abilities important for the successful founding of an entrepreneurial venture (Baron & Markman 2003; Busenitz & Barney, 1997; Schumpeter, 1942) including creativity (e.g., Harrison & Horne, 1999), alertness (e.g., Lim & Dinges, 2010), and social competence (e.g., Anderson & Dickinson, 2010). In other words, I suggest that sleep problems may adversely affect an individual's ability to thrive as an entrepreneur. Consistent with idea that same qualities that prompt entrepreneurial intentions may hurt entrepreneurial action (Busenitz & Barney, 1997, p. 10), I conclude that the same types of sleep problems that motivate people to found a successful entrepreneurial venture may threaten their ability to do so.

In sum, the current paper investigates a straightforward research question: do sleep problems prompt entrepreneurial motives but undermine entrepreneurial means? If so, then sleep problems may be part-and-parcel of the relationships between mental health and entrepreneurship, as explored in the present symposium and depicted in Figure 1—a figure firmly grounded in empirical evidence but not yet subject to empirical testing in total. While the present symposium focuses on the relationships between mental health and entrepreneurship, I assume the validity of these relationships, treating them as critical background for the current focus on sleep. This approach helps to integrate research on sleep, mental health, and entrepreneurship, with important implications for both entrepreneurship researchers and the broader group of management scholars who wish to incorporate issues of sleep and/or mental health into their analyses. Ultimately, I aim to start a conversation on the important but potentially countervailing effects of sleep on entrepreneurship and other managerial behaviors.

For entrepreneurship researchers, I believe this paper holds several important implications. In particular, it: 1) specifies the relationships between sleep and entrepreneurship, indicating several ways that sleep problems might influence entrepreneurial motives or means in parallel or in tandem with mental health conditions; 2) highlights the importance of state-like in addition to trait-like influences on entrepreneurial motives by investigating the role of potentially transitory sleep problems and mental health conditions; 3) helps to crystallize the differences between entrepreneurial motives and means by suggesting that similar psychological processes like sleep may have different or even opposing effects on these two requirements for the completion of the entrepreneurial journey (McMullen & Dimov, 2013). It also holds important implications for the broader group of management scholars who may find sleep and/or mental health conditions relevant to their research, challenging the operating assumption that sleep problems and mental health conditions are necessarily counterproductive and raising the interesting possibility that the costs and benefits of such problems are context-dependent. Finally, many of these theoretical implications hold important implications for practice, especially by calling entrepreneurs' attention to the ways that sleep problems and mental health conditions may help or hurt their entrepreneurial pursuits.

### **Definitions and Scope**

Individuals can suffer from many different types of sleep impairments, including difficulty falling or staying asleep; interrupted, disturbed, or restless sleep; and insufficient sleep duration (e.g., Paavonen et al., 2000). These diverse issues have often been summarized into two categories—problems with sleep quality and sleep quantity. According to Barnes (2012: 3): “Sleep quantity refers to the amount of time an individual spends in a sleeping state, whereas sleep quality refers to difficulty of falling asleep, staying asleep, and the number of awakenings

experienced in the night.” Since people can experience many hours of low-quality sleep or a few hours of high-quality sleep, and since both constitute problematic sleep, the sleep literature has traditionally treated quantity and quality as conceptually and empirically distinct indicators of the same construct: sleep problems (Barnes, 2012; Gunia et al., 2015). In addition, although empirical studies have not always included measures of both quality and quantity, the sleep literature has traditionally expected insufficient sleep quality and quantity to produce parallel and additive effects (Barnes et al., 2011; Bower, Bylsma, Morris, & Rottenberg, 2010; Christian & Ellis, 2011; Hursh et al., 2004; Scott & Judge, 2006), and the empirical evidence has suggested that they do (Barnes et al., 2011). Following this tradition, I review research covering issues of both quality and quantity, using the term “sleep problems” to connote either or both.

This paper is specifically concerned with the impact of sleep problems on entrepreneurship, meaning the process of transforming an idea or opportunity into a profit-making venture (McMullen & Dimov, 2013). In particular, I focus on two conditions that McMullen and Dimov (2013) deemed necessary for the founding of a profit-making (i.e., “successful”) venture: motive (broadly defined as the desire to create such a venture) and means (broadly defined as the ability to create such a venture). The arguments below outline several prominent ways that sleep problems might contribute to motives and/or means, but I cannot assume to identify every such relationship, nor other drivers of motive or means. As suggested by the above definition of entrepreneurship, I use “entrepreneur,” to mean the individual founder of a new, growth-oriented enterprise that engages in creative destruction (Schumpeter, 1942) and/or fills a pragmatically useful niche (Kirzner, 1973; Busenitz and Barney, 1997). Thus, the focus is “opportunity entrepreneurs” (Rosa, Kodithuwakku, & Balunywa, 2006), not “necessity entrepreneurs” or self-employed individuals in general.

To summarize, the current paper considers whether sleep problems might prompt entrepreneurial motives but undermine entrepreneurial means, adopting social and clinical psychology's theoretical lens and individual level of analysis. Yet, I propose relationships involving two different types of individual-level processes: physiological (e.g., sleep) and psychological (e.g., alertness), building directly from the biopsychosocial model's established finding that these processes consistently interrelate at the individual level (e.g., Engel, 1976).

The remainder of this paper unfolds as follows. The next section synthesizes evidence suggesting that sleep problems may prompt entrepreneurial motives. Yet, the subsequent section synthesizes evidence suggesting that sleep problems may undermine entrepreneurial means. The paper concludes with a discussion of implications for future research by entrepreneurship and management scholars, as well as implications for entrepreneurs.

### **SLEEP, MENTAL HEALTH, AND ENTREPRENEURIAL MOTIVES**

I first consider the relationship between sleep problems and entrepreneurial motives, exploring whether sleep problems might stimulate such motives by creating the same behavioral tendencies as clinical ADHD (relationship #1 in Figure 1)—and precipitating and/or mediating the effect of several mental health conditions including depression (relationships #2-3).

#### **Sleep and ADHD**

An accumulating body of evidence suggests that ADHD itself (Dimic & Orlov, 2014; Mannuzza et al., 1993; Wiklund et al., 2016) and/or ADHD-like behavioral tendencies (Lerner, 2016; Thurik et al., 2016; Verheul et al., 2015; 2016) may contribute to individuals' motivation to found entrepreneurial ventures. Defined as “a developmental disorder characterized by ample energy in the form of severe and persistent hyperactivity and distractibility that is essentially driven by behavioral ‘disinhibition’ or a lack of restraint” (Verheul et al., 2015: 86), ADHD

often carries into adulthood and influences a wide range of professional and personal outcomes, including the choice to engage in entrepreneurship (e.g., Mannuzza et al., 1993).

Behaviorally, individuals with ADHD commonly display disinhibition (Verheul et al., 2015), defined as “unrestrained behavior...commonly characterized by (hyper)activity, a proclivity to act on impulse, and attentional variation” (Lerner, 2016: 237). Even in the absence of an ADHD diagnosis, these tendencies can make it difficult for an individual to fulfill the requirements of a standard job, which may “push” them into entrepreneurship (Barkley & Murphy, 2010; Verheul et al., 2015). Additionally, individuals with these tendencies may be especially drawn to flexible and autonomous careers like entrepreneurship that afford the freedom to display such behaviors at will (a “pull” mechanism; Wiklund et al., 2016). For either or both reasons, a growing body of evidence suggests that individuals displaying the behavioral tendencies associated with ADHD, even in the absence of clinical ADHD, experience heightened entrepreneurial motives, seeing the creation of an entrepreneurial venture as a particularly attractive prospect (Lerner, 2016; Thurik et al., 2016; Verheul et al., 2015; 1016).

In sum, the behavioral tendencies associated with ADHD—hyperactivity, impulsivity, and attentional variation—appear to contribute to entrepreneurial motives directly, even in the absence of clinical ADHD. If so, then other factors that heighten these same behavioral tendencies could also contribute to entrepreneurial motives. I argue that sleep problems may do just that.

Among the three behavioral tendencies, sleep problems may have the strongest impact on attentional variation, defined as difficulty regulating the focus of one’s attention and often manifested as wandering attention (Verheul et al., 2016). Since maintaining focused attention involves substantial cognitive effort (Smith, McEvoy, & Gevins, 2002), attention is closely

intertwined with self-control and working memory (Barnes, 2012). Yet, individuals experiencing sleep problems show a distinct lack of self-control (e.g., Barnes, 2012; Christian & Ellis, 2011; Schmeichel & Baumeister, 2004) as well as decrements in executive functioning (Nilsson et al., 2005; Pilcher & Huffcutt, 1996). In addition, sleep problems compromise the neural pathways involved in attention allocation (Smith et al., 2002) and increase people's susceptibility to distraction (Chuah et al., 2010), thereby reducing their ability to regulate the focus of their attention (Barnes, 2012). These effects clearly suggest that sleep problems could contribute to attentional variation.

A second behavioral tendency associated with ADHD, impulsivity, involves acting or deciding before engaging in adequate thought, as well as impatience (Wiklund et al., 2016). Sleep problems have been directly linked to impulsivity (Anderson & Platten, 2011; Kamphuis, Dijk, Spreen, & Lancel, 2014); sleep-deprived individuals, for example, tended to act rather than inhibit demonstrably incorrect behaviors in a laboratory experiment (Anderson & Platten, 2011). Additionally, individuals experiencing sleep problems tend to show extensive delay discounting, a classic indicator of impatience, by reporting a strong preference for present payoffs and a devaluation of future payoffs (Reynolds & Schiffbauer, 2004). Finally, sleep problems are associated with impaired decision-making (Harrison & Horne, 2000) and poor cognitive performance in general (Durmer & Dinges, 2005; Poe, Walsh, & Bjorness, 2010), either or both of which could prompt inadequately considered decisions. These findings suggest that sleep problems could readily increase impulsivity.

A third behavioral tendency associated with ADHD, hyperactivity, involves chronic under-arousal, experienced as the perceived need to always be doing something new and novel (Shaw & Giambra, 1993; White, 1999). While sleepy individuals may feel more lethargic than

active overall, they are likely to display one important aspect of hyperactivity: an increased propensity to take risks. As a result of perceived under-arousal, hyperactive individuals tend to “[try] new experiences, even if they may be risky and dangerous” (Wiklund et al., 2016: 17). Such individuals take more risks in general (Olazagasti et al., 2013) and pursue relatively risky careers like entrepreneurship (Weiss & Murray, 2003). Indeed, risk propensity actually mediates the effect of ADHD on entrepreneurial intentions (Verheul et al., 2015). Sleep problems can also prompt excessive risk-taking (e.g., Hockey, Maule, Clough, & Bdzola, 2000; Killgore, Kamimori, & Balkin, 2011). Across three studies, for example, fatigued individuals systematically made riskier real-life choices than well-rested individuals (Hockey et al., 2000). Additionally, sleep deprivation can lead people to seek gains rather than guard against losses (Venkatraman, Huettel, Chuah, Payne, & Chee, 2011) and can reduce the activation of cognitive punishment systems that might otherwise discourage risky action (Venkatraman, Chuah, Huettel, & Chee, 2007)—either of both of which could increase risk-taking. These patterns raise the prospect that, while sleep problems may not prompt all aspects of hyperactivity, they could alter a person’s risk profile in the same way that hyperactivity does.

Collectively, these findings suggest that people experiencing sleep problems may display many of the same behavioral tendencies as people with ADHD—namely, attentional variation, impulsivity, and hyperactivity. If so, then sleep problems could stimulate entrepreneurial motives *through* these behavioral tendencies, with the tendencies acting as mediators. Thus, I propose that sleep problems could contribute positively to entrepreneurial motives in much the same manner as ADHD (relationship #1 in Figure 1).

In addition, I propose that sleep problems could indirectly influence entrepreneurial motives by mediating and/or precipitating the effect of several mental health conditions on

entrepreneurial motives—most obviously, clinical ADHD. Individuals with clinical ADHD are known to have difficulty sleeping (e.g., Owens, 2005). Indeed, Wiklund and colleagues noted that sleep problems represented a primary reason that the clinically-diagnosed ADHD entrepreneurs in their study gravitated to entrepreneurship, as the flexibility of entrepreneurial ventures allowed them to work whenever they felt rested. If so, then sleep problems could mediate the effect of ADHD on entrepreneurial motives (relationship #2 in Figure 1).

### **Sleep and Depression**

While ADHD is relatively trait-like disorder, with genetic factors playing a major role and symptoms persisting for long periods of time (Mannuzza et al., 1993; Wiklund et al., 2016), emerging research also links entrepreneurial motives to at least one more state-like mental health disorder: depression. A broad survey of entrepreneurs, for example, showed that entrepreneurs were more likely than non-entrepreneurs to suffer from depression (Freeman, Johnson, Staudenmaier, & Zisser, 2015). Additionally, and consistent with a large body of research demonstrating comorbidities between ADHD and other conditions (Ostrander & Herman, 2006; Pliszka, 2000), Freeman and colleagues' research suggested that entrepreneurs who experience ADHD are also more likely to experience depression.

In addition to this empirical evidence for a link between depression and entrepreneurial motives, another recent paper makes a theoretical case (Hessels, Rietveld, Thurik, & Van der Zwan, 2017). It suggests that depressed individuals may face both lower opportunity costs and greater benefits from starting an entrepreneurial venture, which could allow them to avoid unemployment and/or reassert control over the conditions precipitating depression. Collectively, these recent papers suggest that depression may also link to entrepreneurial motives, but how does depression relate to sleep problems?

Psychological research conducted in the military clearly suggests that sleep problems both cause and are caused by depression. Many studies of military personnel, for example, have suggested that sleep problems precipitate depression (e.g., Gehrman et al., 2013; Luxton et al., 2011; Taylor et al., 2014), while others suggest at least the possibility of the reverse (e.g., Harvey, Jones, & Schmidt, 2003; Seelig et al., 2010; Wright et al., 2011). The military is a somewhat unique setting, but psychological research suggests that these relationships may extend outside of the military. For example, studies have documented direct relationships and/or comorbidities between sleep problems and depression (Adrien, 2002). Additionally, sleep problems are related to psychological states indicative of depression including low motivation (Baranski, Cian, Esquievie, Piegeau, & Raphel, 1998), negative emotions (e.g., Bower et al., 2010), and a lack of resilience (Segovia, Moore, Linnville, Hoyt, & Hain, 2013).

Overall, these findings suggest that sleep problems and depression may have a reciprocal relationship—with each fueling the other. If so, and if the emerging theory and evidence of a link between depression and entrepreneurial motives stands up to replication, then sleep problems could mediate the positive effect of depression (like ADHD) on entrepreneurial motives. Alternatively, sleep problems could increase a person's susceptibility to depression, which would then be expected to have a positive downstream effect on entrepreneurial motives. Either way, sleep problems would be expected to increase people's desire to found an entrepreneurial venture (relationship #3 in Figure 1). Interestingly, these possibility are broadly consistent with a separate line of research indicating that military personnel who have experienced a traumatic, discontinuous event (e.g., the loss of a limb) may be particularly likely to develop entrepreneurial motives (Haynie & Shepherd, 2011). Since traumatic events in the military are

known to prompt both sleep problems and depression (e.g., Wright et al., 2011), that conclusion is consistent with the arguments presented here.

In sum, sleep problems may be part-and-parcel of the relationship between mental health conditions and the development of entrepreneurial motives. Specifically, sleep problems may heighten entrepreneurial motives through three different pathways—by creating ADHD-like behavioral tendencies, by mediating the effect of ADHD and/or depression, and by precipitating depression, which subsequently prompts entrepreneurial motives. Across all of these pathways, the bottom line is the same: sleep problems are likely to prompt entrepreneurial motives, increasing an individual's desire to found an entrepreneurial venture.

### **SLEEP, MENTAL HEALTH, AND ENTREPRENEURIAL MEANS**

If sleep problems prompt entrepreneurial motives, it is natural to wonder what effects these problems might have on people's ability to successfully found an entrepreneurial venture, i.e., their entrepreneurial means. In particular, I focus on the ways that sleep problems might influence three basic psychological capabilities that: 1) sleep problems are known to influence and 2) are known to be important for the successful founding of an entrepreneurial enterprise: creativity (e.g., Schumpeter, 1942), alertness (Busenitz & Barney, 1997; Gaglio & Katz, 2001; Tang, Kacmar, & Busenitz, 2012), and social competence (e.g., Baron & Markman 2003; relationship #4 in Figure 1). In so doing, I recognize that the link between each of these constructs and entrepreneurial outcomes has been convincingly established at a theoretical level, but rests on a limited number of empirical studies. Thus, my analysis is necessarily preliminary and dependent on further empirical corroboration.

#### **Sleep and Creativity**

Both scholars and popular audiences often see entrepreneurs as individuals who engage in “creative destruction” that eliminates a status quo and replaces it with something entirely new (Schumpeter, 1942). Accordingly, creativity, or the ability to produce novel and useful ideas (Amabile, 1996; Stein, 1974), features prominently in the image of the entrepreneur. As part of their creativity, entrepreneurs are also thought to rely on improvisation (Hmieleski & Corbett 2006) and would seem to need the hope and optimism to believe that their new vision of reality will work (e.g., Hmieleski & Baron, 2009). Finally, since positive affect may enhance creativity (Baron & Tang, 2011)—at least in moderate doses (Baron, Hmieleski, & Henry, 2012)—entrepreneurs are generally thought to benefit from positive mood and emotions.

Unfortunately, sleep problems would seem to undermine these qualities, as sleep loss undercuts the type of innovative and flexible thinking involved in creative, improvisational acts (Harrison & Horne, 1999). Individuals subjected to sleep deprivation and then asked to play an interactive marketing computer game, for example, showed a marked reduction in the production of flexible and innovative ideas, relying heavily on previously developed and now outdated strategies (Harrison & Horne, 1999). This pattern may reflect a general pattern in which sleepy individuals facing decisions that require creativity and insight make poorer choices (Wagner, Gais, Haider, Verleger, & Born, 2004). Additionally, meta-analytic results suggest that low sleep quantity reduces hope and optimism (Pilcher & Huffcutt 1996), and thus the entrepreneur’s ability to believe in their path-breaking ideas<sup>1</sup>. Finally, individuals with sleep problems suffer decrements in positive mood (e.g., Bower et al., 2010; Pilcher and Huffcutt, 1996), which could dampen their downstream creativity. Collectively, these results suggest that sleep problems could

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<sup>1</sup> It should be noted that the relationship between optimism and entrepreneurial performance is subject to scholarly debate, with many authors postulating a positive relationship but a few finding curvilinear effects (Baron, Hmieleski, & Henry 2012) or even a negative relationship (Hmieleski & Baron, 2009). I return to this issue in the discussion.

make it harder for entrepreneurs to engage in creative destruction. Indeed, a working paper offers preliminary evidence for this claim, showing that individuals subjected to sleep deprivation performed worse in an ideation task (Gish, Wagner, Barnes, & Grégoire, 2017).

### **Sleep and Alertness**

Beyond creative destruction, scholars have repeatedly conceived of entrepreneurs as individuals who alertly notice subtle disequilibria in the economy and act to correct them. While Kirzner effectively defined entrepreneurs as those who are alert (1973); i.e., who notice opportunities without search (1979); subsequent entrepreneurship scholars have refined the psychological quality of alertness and defined it as a major contributor to entrepreneurial performance (Baron, 2006; Baron & Ensley, 2006; Busenitz & Barney, 1997; Gaglio & Katz, 2001; Tang et al., 2012; Valliere, 2013). Gaglio and Katz (2001), for example, defined alertness in terms of both correct perception and correct interpretation of information, while Tang and colleagues (2012) developed a broader model of alertness including the three elements of scanning and search, association and connection, and evaluation and judgment. These papers conceptualize alertness as a relatively overt and explicit process, but other important advances focus on more implicit processes involving cognitive schemata. In particular, alertness has been conceptualized as the possession of rich schemata, associated with environmental stimuli and primed for activation (Valliere, 2013), and/or schemata sufficiently developed to detect appropriate patterns in environmental stimuli by “connecting the dots” (Baron, 2006; Baron & Ensley, 2006).

Unfortunately, the sleep literature provides many reasons to suspect that sleep problems may undermine alertness. Several studies have directly shown that sleep problems reduce alertness, defined here as the extent to which individuals subjectively or objectively notice

stimuli in their environment (Beaumont et al. 2001; Buysse et al., 2007; Dijk, Duffy, & Czeisler, 1992; Basner et al., 2008). In a diary study, for example, individuals with insomnia reported less daily alertness than individuals without insomnia, and their retrospectively reported sleep problems negatively predicted their future alertness (Buysse et al., 2007). In addition, and as noted, people suffering sleep problems tend to display conditions indicative of reduced alertness including increased distraction (e.g., Lim & Dinges, 2010), reduced attention (Barnes, 2012), impaired decision-making (Harrison & Horne, 2000), poor cognitive performance (Durmer & Dinges, 2005; Poe, Walsh, & Bjorness, 2010), and limited executive functioning (Nilsson et al., 2005; Pilcher & Huffcutt, 1996). Finally, since sleep itself plays a central role in the consolidation of memories into cognitive schemata (e.g., Lewis & Durrant, 2011; Stickgold & Walker, 2013) as well as the retrieval of appropriate mental models (Fortier-Brochu & Morin, 2010), sleep problems are likely to slow the development and deployment of schemata involved in entrepreneurial alertness. Collectively, and notwithstanding some disciplinary differences in the definition of alertness, these results clearly suggest that sleep problems could slow and/or interfere with both the explicit (e.g., Tang et al., 2012) and implicit (Valliere, 2013) processes involved in the development and deployment of entrepreneurial alertness. Indeed, a working paper offers preliminary evidence for this claim, showing that entrepreneurs experiencing sleep problems performed worse in an idea evaluation task (Gish et al., 2017).

### **Sleep and Social Competence**

Finally, entrepreneurship scholars have suggested that entrepreneurs need more than creativity and/or alertness to succeed. They need to get along with a wide array of people (Baron & Markman 2003). In the process of founding an entrepreneurial venture, for example, entrepreneurs must manage employees, collaborate with partners, and/or negotiate with funders.

In particular, they need to cultivate a variety of trusting relationships (Maxwell & Levesque, 2014). Accordingly, prospective entrepreneurs need some degree of social competence, a broad construct consisting of the ability to effectively relate to others (Baron & Markman 2003).

Once again, the literature provides many reasons to suspect that sleep problems may interfere. As noted, people experiencing such problems suffer significant decrements in positive mood (e.g., Bower et al., 2010; Pilcher and Huffcutt, 1996), as well as reduced emotional intelligence (Killgore et al., 2008). They display reduced trust in others and a lesser capacity for cultivating trusting relationships (Anderson & Dickinson, 2010). They experience increased conflict (Gordon & Chen, 2014) and impatience with other people (Swanson et al., 2011), and they tend to socially loaf (Hoeksema-van Orden, Gaillard, & Buunk, 1998). Their disinhibition (Christian & Ellis, 2011) may undermine others' support for their entrepreneurial efforts (Lerner, 2016). Their reduced moral awareness (Barnes, Gunia, & Wagner, 2015a) and/or overtly unethical behavior (Barnes et al., 2011), in turn, may poison their interpersonal relations (if not their budding enterprise as a whole). Collectively, these results suggest that sleep problems could reduce entrepreneurs' social competence.

In sum, sleep problems may undermine three psychological capabilities that are important for the successful founding of an entrepreneurial venture: creativity, alertness, and social competence (relationship #4 in Figure 1). In other words, sleep problems could undermine entrepreneurial means even while stimulating entrepreneurial motives. Thus, the possibility of a sleep trap, which I explore in the General Discussion.

Before expounding on the sleep trap, however, it is worth noting one additional implication of Figure 1. Relationships #2 and 3 in the figure suggest that ADHD and depression could heighten sleep problems. If so, then sleep problems could also act as a mediator of the

relationship between these two mental health conditions and decreased entrepreneurial means. While not the focus of the current paper, this possibility could help to explain several of the findings from the present symposium and clearly deserves additional research. If upheld, these mediated relationships between mental health, sleep, and entrepreneurship could further fuel the possibility of a sleep trap.

### **GENERAL DISCUSSION**

Drawing from research on sleep, psychology, and entrepreneurship, this paper has sought to start a conversation about the influence of sleep on entrepreneurial motives and means. It has suggested that sleep problems may stimulate people's desire to found an entrepreneurial enterprise even while undermining their ability to do so successfully. I call these countervailing effects of sleep problems the "sleep trap" to capture the idea that sleep problems could elicit entrepreneurial motives that people are predisposed to implement poorly.

Since these effects are predicted to operate in parallel and in tandem with a person's mental health conditions, I conceive of the sleep trap as part-and-parcel of the relationship between mental health and entrepreneurship—the topic of the present symposium. Collectively, these conclusions appear to hold some important theoretical implications for both the entrepreneurship literature and a broader group of management scholars, as mentioned at the start of the paper. I now discuss some specific research avenues suggested by the current research, as well as its practical implications.

#### **Implications for Future Research**

The conclusions in the current paper point toward some important considerations for future research on both entrepreneurship and management in general. In terms of the former, since entrepreneurship research has only begun to examine the role of mental health and has not

specifically focused on sleep, more research on both of these factors is urgently needed. A combination of controlled lab studies that could isolate the effects of key variables like sleep loss with naturalistic field studies that could study effects of sleep problems *in situ* would be helpful. Indeed, mixed methods (e.g., Creswell & Plano Clark, 2007) seem particularly important in this context since experiments can achieve a great deal of internal validity by manipulating sleep deprivation (e.g., Harrison & Horne, 1999), but can also suffer from a lack of external validity in the entrepreneurial setting. Field studies, in contrast, can richly capture the entrepreneurial setting but tend to rely on cross-sectional surveys (Short, Ketchen, Shook, & Ireland, 2010), which cannot typically tease apart causality. While limited in and of themselves, cross-sectional surveys could also be usefully combined with qualitative studies that elucidate causal processes, or longitudinal field studies that follow entrepreneurs as the processes in Figure 1 unfold.

In addition to testing Figure 1 and its implications, future research could examine some specific and important questions arising from the model. First, does the dampening effect of sleep problems on optimism hurt or help entrepreneurial means? I have suggested the former, but footnote #1 identifies at least one paper (Hmieleski & Baron, 2009) suggesting that optimism can sometimes hamper entrepreneurial performance. If so, then sleep problems could occasionally enhance entrepreneurial means by dampening their optimism. Second, does Figure 1 hold the same implications for creatively destructive Schumpeterian entrepreneurs (e.g., cutting-edge innovators) and pragmatically useful Kirznerian entrepreneurs (e.g., corner store owners; if, indeed, they represent different subtypes)? I have suggested so, but future research might consider this question more explicitly. Similarly, research could study the potentially differential effects of sleep problems on opportunity versus necessity entrepreneurs, entrepreneurs in different industries, and other important subtypes. Third, do sleep problems and mental health

conditions have curvilinear effects, and does Figure 1 apply to mental health conditions other than the two I have emphasized (ADHD and depression)? Fourth, is it possible that sleep problems increase entrepreneurial motives but not the active implementation of those motives? I have assumed that motives generally predict implementation, as does much entrepreneurship (and social psychological) research, but research could usefully examine whether sleepy people form entrepreneurial motives that they ultimately fail to implement.

Additionally, entrepreneurship research could usefully investigate what processes initiate and moderate the relationships in Figure 1. For example, do external shocks to the system that exacerbate people's sleepiness (e.g., the spring change to Daylight Savings Time; Barnes et al., 2015a) also tend to trigger the relationships in the figure? What factors might amplify or dampen the dual effects of sleep problems (as they are surely not deterministic)? Perhaps individuals who need less sleep are less susceptible to these effects. Or perhaps entrepreneurs who can tailor their sleep schedule to their work schedule, taking naps at odd hours as the job allows (Wiklund et al., 2016), can avoid some of the more pronounced consequences of sleep problems for entrepreneurial means.

Most importantly, if sleep problems elicit entrepreneurial motives but hamper entrepreneurial means, does this result in a trap whereby many entrepreneurs are predisposed to underperform? To the extent that the grueling experience of founding entrepreneurial ventures may actually exacerbate a person's sleep problems over time (e.g., Spivack, McKelvie, & Haynie, 2014; Wincent, Örtqvist, & Drnovsek, 2008), a sleep trap seems distinctly possible. If so, what interventions could help surmount the trap? What about an intervention to help entrepreneurs leverage their sleep problems when considering whether to launch a venture, but mitigate those problems when implementing their plans? Perhaps the ability to exit, take a break,

or work with a well-rested partner during the founding process could help entrepreneurs reap greater benefits from their sleep problems.

Conversely, if sleep problems do not result in a sleep trap, why not? Does entrepreneurial exhaustion eventually convince entrepreneurs that they need to sleep? If sleep problems hamper the founding of an initial entrepreneurial venture, do entrepreneurs at least sleep better during their next venture? At the most general level, a comprehensive understanding of the circumstances in which sleep problems help and hurt entrepreneurs seems to represent an important and an intriguing avenue for future research.

In addition to pointing toward future entrepreneurship research, the current framework suggests some new and different interpretations of prior entrepreneurship research. In particular, the current framework suggests that many of the presumed and/or documented dispositional differences of entrepreneurs versus non-entrepreneurs could actually reflect short-term or situational differences. For example, scholars have long been interested in the unique features of entrepreneurs' personalities (e.g., Hatten, 1997). Mixed findings (e.g., Bygrave, 1989) have led others to focus on entrepreneurs' unique cognitive styles (e.g., Baron, 1998, 2000a, 2000b)—which, though not a personality variable—may still reflect an individual difference. The current framework suggests that mixed findings on the entrepreneurial personality may actually reflect situational influences masking personality differences. Entrepreneurs may have responded similarly to non-entrepreneurs on personality measures, for example, because the former were suffering state-like sleep problems that masked their personality differences. Similarly, with respect to cognitive styles, the current framework suggests that the documented differences in thinking may actually reflect situational influences. If entrepreneurs are less likely than non-entrepreneurs to engage in counterfactual thinking (Baron, 2000b), for example, it could be

because they are simply too sleepy to engage in the seemingly effortful process. These examples illustrate how state-like versus trait-like interpretations of prior research could lend a distinctly different flavor to the literature.

In addition to these implications for the entrepreneurship literature, past and future, the current paper also raises some important questions for management research more broadly. In particular, it raises the general and theoretically pressing question of when sleep problems may help and hurt in organizations. Most prior sleep research has assumed that sleep problems hurt organizations and the people within them (for a review, see: Barnes, 2012), but the present paper suggests that the story is more complicated. In particular, it suggests that sleep problems may elicit some behaviors that redound to the benefit of organizations.

For example, just as sleep problems may prompt entrepreneurial motives, with the associated societal benefits (Acs, 1999), these problems may motivate organizational actors to take a variety of risky but potentially necessary actions like selling issues, proposing ideas, and embarking on new strategies. Indeed, the general idea that sleep problems may encourage a variety of proactive behaviors (Grant & Ashford, 2008; Thurik et al., 2016) seems particularly promising. A model to examine these possibilities might start by theorizing about the similarities and differences between entrepreneurial and bureaucratic organizational activities (e.g., see Lerner, 2016), noting which bureaucratic activities resemble the act of founding an entrepreneurial venture. It seems likely that the relationships in this paper could inform the entrepreneurial features of life in any organization, not just the lives of entrepreneurs *per se*.

Building from the research questions above, however, managerial research might also examine the less optimistic conclusion that managers may suffer a sleep trap, experiencing the motivation to make risky yet necessary decisions but also encountering difficulty in executing

those decisions. If so, which interventions could surmount the trap? How could managers leverage their sleep problems when useful (e.g., when acting entrepreneurially or proactively) but manage or shed them when harmful (e.g., when acting bureaucratically)? In light of the countervailing effects of sleep problems, longitudinal research that traces these countervailing effects in organizations seems important. The present framework, I believe, offers a useful roadmap for exploring these and many other interesting avenues for management research.

Beyond the implications for management research in particular, sleep problems represent a topic rife for cross-disciplinary research (e.g., see Ireland & Webb, 2007; Short et al., 2010). For example, sociologists might be interested in the societal drivers of sleep problems, anthropologists in the influence of national or regional culture on sleep problems, economists in the macro-level relationship between sleep problems and economic growth, psychologists in the relationship between individual differences and sleep problems, operations scholars in the effect of sleepiness on supply chains, finance scholars in the effect of sleep problems on portfolio management, marketing scholars in the effect of sleep problems on consumer decision-making, and accounting scholars in the effect of sleep problems on accounting mistakes and misstatements. Sleep problems clearly offer fertile ground for cross-disciplinary investigation and, hopefully, cross-pollination.<sup>2</sup>

### **Implications for Entrepreneurs**

In addition to its theoretical and research implications, the current paper sounds a practical note of caution for would-be and actual entrepreneurs. For would-be entrepreneurs, it suggests that their entrepreneurial motives may be arising—at least in part—from their biology (e.g., problematic sleep patterns). Thus, without discouraging anyone's intention to become an

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<sup>2</sup> My sincere thanks to an anonymous reviewer, who suggested this implication and supplied many of the ideas in this paragraph.

entrepreneur and create the associated societal value (Acs, 1999), this paper does suggest that would-be entrepreneurs should weigh their motives carefully, ensuring that they reflect call of careful consideration. Indeed, this implication complements an important implication of research on cognitive styles (e.g., Baron, 2000ab) and the “dark triad” (e.g., Hmieleski & Lerner, 2016): that entrepreneurs may wish to ensure their intentions reflect sound decision-making and reasoned action rather than cognitive bias or narcissistic tendencies.

In terms of entrepreneurial means, the current research suggests that the harried process of founding an entrepreneurial venture—harried because of a genuine desire to see the enterprise thrive—may actually undermine its ability to thrive. Based on this research, entrepreneurs are advised to ensure that they fully account for the value of their own health while building their organization’s health, sleeping well enough to help their enterprises, if not themselves. Overall, this research suggests that entrepreneurs are well-advised pay attention to their own sleep patterns while developing entrepreneurial motives and means, adjusting for the potentially positive bias on their desires as well as the potentially negative bias on their abilities.

## **Conclusion**

The current symposium usefully points to several relationships between mental health conditions and entrepreneurship. The current paper has suggested that sleep problems may be part-and-parcel of these relationships, helping to stimulate entrepreneurial motives but also undermine entrepreneurial means. Fully testing the model and its implications—for entrepreneurship and management scholars as well as entrepreneurs themselves—offers substantial opportunity for future research.

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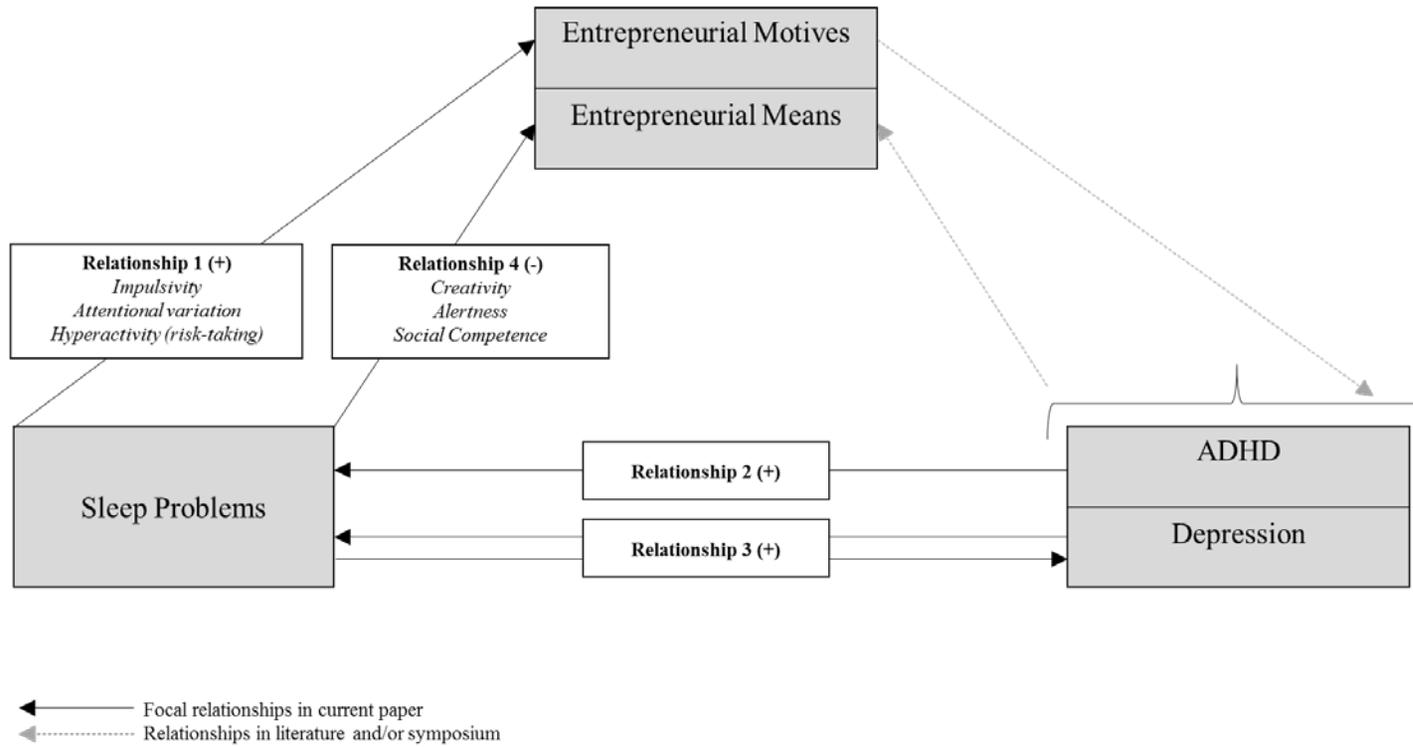
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**Figure 1: Theoretical framework**



## RUNNING HEAD: Sleep and Entrepreneurship

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