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Adult ADHD Symptoms and Passive Leadership:

The Mediating Role of Daytime Sleepiness.

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Abstract

Passive leadership is attracting empirical interest with the detrimental effects of this type leadership on a broad array of individual and organizational outcomes becoming apparent. However, just why leaders would engage in this type of non-leadership has received less research attention. We investigate whether and how leaders' ADHD is associated with passive leadership. Using a framework specifying how the physiology of sleepiness impacts the workplace, we hypothesize that leaders' ADHD is associated with passive leadership indirectly through daytime sleepiness. After controlling for leaders' age, gender, and preclinical symptoms of depression and anxiety, standard OLS regression procedures were implemented through Hayes' PROCESS models. Multisource data from 98 leader-follower groups (M number of followers per leader = 4.38, SD = 1.78) showed that the effects of leaders' ADHD symptoms on passive leadership were mediated by daytime sleepiness. Conceptual, methodological and practical implications are discussed.

Key Words: Passive leadership, adult ADHD, daytime sleepiness

Adult ADHD Symptoms and Passive Leadership: The Mediating Role of Daytime Sleepiness**.**

The conundrum of passive leadership is why some leaders, in an often dynamic and competitive environment, tend toward inaction. This is a particularly important issue: While not the focus of sustained research until recently, what has most often been referred to as laissez faire leadership has been shown to be associated with a host of negative outcomes for employees such as increased bullying (Skogstad, Einarsen, Torsheim, Aasland, & Hetland, 2007), occupational safety incidents (Kelloway, Mullen & Frances, 2006) and mental health challenges (Barling & Frone, 2017). Add to this the fact that organizations are not immune from the negative effects of inactive leadership (e.g., a lower quality learning climate; Hetland, Skogstad, Hetland & Mikkelsen, 2011), and the puzzle of passive leadership becomes even more apparent.

In this study, we turn our attention away from the consequences of an inactive style of leadership and responding to calls to gain a greater understanding of the antecedents of leadership behaviors (Barling, 2014), seek to identify the conditions under which passive leadership becomes more likely. **We examine how pre-clinical symptoms of attention deficit hyperactivity disorder (ADHD) are related to passive leadership. This is an important focus for several reasons. First, although as will be seen a minority of adults would have a clinical diagnosis of ADHD—and this is true of organizational leaders as well, many more would manifest pre-clinical symptoms of ADHD such as difficulty following directions, prioritizing problems, difficulty with concentration, and trouble with organizing tasks or completing work within time limits (Dryden-Edwards & Shiel, 2017; Kooij, 2013). Second, adult ADHD is a highly comorbid disorder (i.e., 50% to 75% of cases) and is usually found in concert with sleep disorders, anxiety, depression, addiction, bipolar or personality**

disorder (Kessler et al., 2006). Third, adults with ADHD have lowered work performance (Halbesleben, Wheeler, & Shanine, 2013). Last, we also know that leaders' mental health affects leadership behavior (e.g. Byrne et al., 2014). Thus, understanding the possible link between pre-clinical symptoms of adult ADHD and leadership quality is an important research topic.

Following Mullins, Cortina, Drake, and Dalal's (2014) conceptual model specifying how the physiology of sleepiness impacts the workplace, we suggest that leaders' attention deficit hyperactivity disorder symptoms are associated with passive leadership indirectly through daytime sleepiness. In the most general sense daytime sleepiness reflects the desire for sleep (Dement & Carskadon, 1982) which results from poor sleep quality and quantity, circadian rhythm problems, central nervous system (CNS)-acting drugs, or the presence of a CNS disorder (i.e., ADHD; Mullins et al., 2014). In turn, the outcomes of daytime sleepiness include cognitive and affective problems which would be reflected in poor work performance and job withdrawal.

The current research makes three potential contributions. First, this study focuses on the under-researched area of passive leadership behavior and its antecedents, and specifically how symptoms of a mental illness (in this case, pre-clinical symptoms of ADHD) impact passive leadership behavior. Second, this study tests the proposed framework of the relationship between daytime sleepiness and the workplace (Mullins et al., 2014). Third, this study extends our understanding of the consequences of subclinical symptoms of ADHD to the workplace.

Theoretical background

Passive leadership

Awareness of the nature and effects of an inactive leadership style are by no means new. More than 50 years ago, Blake and Mouton (1964) discussed the absence of concern for both

people and production, as “impoverished management”. Some two decades later, Bass (1985; 1998) introduced the notion of laissez faire leadership as a formal part of the transactional leadership component of transformational leadership. Within this framework, laissez faire leadership is characterized by excessive inactivity, such as when leaders abdicate their decision-making duties, avoid and deny responsibility, and procrastinate where possible (Bass, 1998). Laissez faire leadership is consistently associated with negative outcomes for employees, and negative evaluations of the leaders’ performance, so much so that Judge and Piccolo (2004, p. 765) concluded in their meta-analysis that “… the absence of leadership (laissez-faire leadership) is nearly as important as the presence of other forms of leadership”.

Despite the fact that Bass (1998) introduced the term laissez-faire leadership, terminological and conceptual confusion has been common, with studies also referring to inactive leadership and passive leadership and with laissez faire leadership also defined as the combination of laissez-faire leadership and passive management-by-exception (Bass & Avolio, 1993; Kelloway, Sivanathan, Francis, & Barling, 2005).

Within this context, Hinkin and Schiesheim (2008) developed a model of passive leadership based around reward omission and punishment omission, which is a model of passive leadership that is a narrower conceptualization based on laissez faire leadership. Unlike impoverished management and laissez-faire leadership, which are largely atheoretical and descriptive, Hinkin and Schriesheim (2008) located their model of passive leadership within an operant conditioning framework, allowing them to specify the nature of the behavior and identify associated outcomes. They posit that a primary leadership function is to respond appropriately to followers’ performance, whether positively or negatively; and research highlights the benefits of doing so (Komaki, Bardwick & Scott, 1978). Thus, for optimal employee performance to be

sustained over time, positive performance would be followed by some form of reward or indication of appreciation, while poor or negative performance would be followed by feedback or negative consequences. Failure to do so would result "passive leadership" (Hinkin & Schreisheim, 2008). Both reward and punishment omission are associated with poorer subordinate satisfaction with and perceptions of leadership, and lower levels of subordinate role clarity and performance (Hinkin & Schreisheim, 2008). In the current study, we use Hinkin and Schreisheim (2008)'s conceptualization of passive leadership.

Despite the greater conceptual clarification of the nature and outcomes of passive leadership offered by Hinkin and Schreisheim (2008), the reasons why leaders might engage in passive leadership remain poorly understood. Therefore, in the current study, we turn our attention away from the outcomes of passive leadership (i.e., reward and punishment omission), and begin to ask what factors may predispose leaders to be passive in the first place, namely leader's own symptoms of mental disorders and specifically in the current study ADHD.

Attention deficit hyperactivity disorder: A focus on non-clinical symptoms

Most people associate attention deficit hyperactivity disorder (ADHD) with children, and while ADHD tends to develop in childhood, adult experiences of ADHD are not uncommon; indeed, some 50% of childhood cases of ADHD continue into adulthood (Barkley, 1990; Matza, Paramore, & Prasad, 2005). Estimates of ADHD in the adult population range from 1 - 6% (Kooij, 2013), with some concern that the prevalence could be higher for several reasons, including the stigma associated with seeking and receiving an ADHD diagnosis (Kessler et al., 2006; Kooij et al., 2012). In the current study we focus on symptoms of ADHD in a community sample of organizational leaders, not the presence (or absence) of a clinical diagnosis of ADHD.

In adults, ADHD is characterized by inattentiveness and hyperactivity/impulsivity (American Psychiatric Association, 2013). Most recently, adult ADHD has been recognized as a neurobiological/neurodevelopment disorder (i.e., a central nervous system disorder) in the executive functioning of the brain (Kooij, 2013). Executive functioning involves the cognitive abilities required for problem-solving in the pursuit of future goals (Pennington & Ozonoff, 1996). There are five executive functioning domains: inhibition (the ability to check or interrupt one's own actions), set shifting (the ability to switch between actions or solutions), fluency (being able to generate multiple or different solutions), planning (the ability to plan the steps required to solve a problem), and working memory (the ability to access and use information during task execution; Barkley, 1997). Meta-analytic evidence suggests medium effect sizes between ADHD and all domains of executive functioning (Boonstra, Oosterlaan, Sergeant, & Buitelaar, 2005), with ADHD being most greatly associated with behavioral inhibition (Pennington & Ozonoff, 1996). This is critical, as poor inhibition causes difficulties with working memory, attention/vigilance, planning and self-regulation (Barkley, 1997; Hervey, Epstein & Curry, 2004; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005).

Attention deficit hyperactivity disorder symptoms and passive leadership.

Because of its more recent emergence in the psychological literature, research on adult ADHD and its impact on work-related outcomes remains scarce. Of the research that has been conducted, results suggest that adult ADHD is associated with decreased performance, higher conflict with coworkers, lower motivation and higher turnover (Barkley & Murphy, 2010; de Graaf et al., 2008; Harpin, 2005). More recently, Halbesleben et al., (2013) showed that ADHD symptoms were associated with lower self, co-worker and supervisor-rated performance, with the strongest relationship being with in-role performance.

In the current study, we turn out attention to the question of whether adult ADHD symptoms affect the quality of organizational leadership. This is consistent with accumulating evidence that leaders' psychological well-being matters with respect to the quality of their leadership behaviors (Barling & Cloutier, 2017; Anonymous, 2017). **For example, the effects of family undermining on subsequent abusive supervision are buffered under conditions of leaders' high self-control (Kiewitz et al., 2012).** At the same time, when leaders' psychological well-being is compromised, leadership quality suffers. As one example, even at moderate doses, alcohol consumption decreases transformational leadership and increases abusive supervision (Byrne et al., 2014). We hypothesize that any effects of ADHD symptoms on passive leadership are indirect and mediated through daytime sleepiness. To understand this indirect effect, we first introduce daytime sleepiness as a construct, and then discuss relationship between ADHD symptoms and daytime sleepiness.

Daytime Sleepiness

Daytime sleepiness is a physiological need associated with increased sleep pressure that leads to decrements in daytime functioning (Drake, 2011; Roehrs, Carskadon, Dement, & Roth, 2011). Daytime sleepiness is the most common and immediate consequence of sleep problems (e.g., Pack et al., 2006; Swanson et al., 2011) with subclinical levels of sleepiness affecting 33% of the general population (Drake et al., 2010). The most debilitating state of sleepiness, known as excessive daytime sleepiness, affects at least 11% of the general population (Drake, 2011). Excessive daytime sleepiness is a main symptom/diagnostic tool for many sleep disorders such as sleep apnea (Driver, 2016).

In their conceptual model Mullins et al. (2014) state that daytime sleepiness is the main pathway through which sleep affects organizational outcomes. They suggest that daytime

sleepiness influences workplace outcomes, largely through physiological changes, such as reduced cognitive ability and self-regulation (Mullins et al., 2014). The causes of daytime sleepiness are low sleep quality and quantity, circadian rhythm problems, central nervous system (CNS)-acting drugs, or the presence of a CNS disorder (Mullins et al., 2014). ADHD is classified as a CNS disorder and specifically a neurobiological/neurodevelopment disorder (Kooij, 2013). Thus, as suggested in Mullin et al's (2014) framework, an outcome of ADHD is daytime sleepiness, and this is potentially one of the main mechanisms through which CNS disorders, such as ADHD, impact organizational outcomes.

ADHD symptoms and daytime sleepiness.

As previously stated, CNS disorders lead to daytime sleepiness (Mullins et al., 2014) and with respect to ADHD, adults with ADHD exhibit high rates of sleep problems (Boonstra et al., 2007). Clinical findings suggest that around 70% of adults with ADHD complain of a lifelong pattern of difficulty falling asleep and waking up at normal times of the day (Boonstra et al., 2007; Kooij, Aeckerlin, & Buitelaar, 2001). Added to this, approximately 80% of ADHD patients suffer from delayed sleep onset which is prevalent in children and adolescents as well as in adults with ADHD (Van der Heijden, Smits, & Gunning, 2005; Van Veen, Kooij, Boonstra, Gordijn, & Van Someren, 2010). Delayed sleep onset is characterized by a delay of the sleep/wake cycle, with high activity level in the late evening and night, sleep-onset insomnia when trying to get asleep early, and a preference for late sleep and late rising (Bijlenga et al., 2013). Delayed sleep onset is associated with daytime sleepiness, especially in the instances that individuals are having to get up early for work (Bijlenga et al., 2013).

For example, in a non-clinical sample of 148 college students (Kass, Wallace, & Vodanovich, 2003), symptoms of ADHD correlated significantly with insomnia complaints (r =

0.47) and daytime sleepiness (r = 0.61). In a second study of college students (n=62) who were diagnosed with ADHD, daytime sleepiness longitudinally predicted school maladjustment and overall functional impairment across life domains, including school and personal life (Langberg, Dvorsky, Becker, & Molitor, 2014). Last, Surman et al. (2009) examined the relationship between ADHD and sleep impairment in an adult community sample, comparing those with (N=182) and without (N=117) ADHD symptoms. They controlled for ADHD mediation use, bipolar disorder, depression, anxiety disorders and substance abuse. They found that adults with ADHD went to bed later, took longer to fall asleep and were more likely to experience difficulty going to sleep, sleeping restfully and waking in the morning compared to controls. Adults with ADHD also experienced more daytime sleepiness than controls (Surman et al., 2009). These sleep disturbances were not attributable to comorbid mental health conditions or ADHD drug use (Surman et al., 2009). This is important, as a main feature of adult ADHD is that it does not often occur in isolation. Instead, there is a high prevalence of comorbid disorders, with some estimates suggesting that 50% to 75% of cases of ADHD manifest some comorbidity, such as sleep disorders, anxiety, depression, addiction, bipolar or personality disorder (Kessler et al., 2006).

Thus, there is clinical and scientific evidence that adult ADHD intrinsically involves sleep disturbances (Sobanski, 2006). In fact, restless and disturbed sleep were at one time part of the DSM diagnostic criteria for ADHD, which have since been removed and thought to be nonspecific symptoms (Owens, 2009). Therefore, we hypothesize that adult ADHD symptoms will predict daytime sleepiness.

Hypothesis 1: Adult ADHD symptoms predict daytime sleepiness.

Daytime sleepiness and passive leadership behavior.

Why might daytime sleepiness lead to passive leadership? Appropriately rewarding and/or punishing subordinates requires that leaders first recognize the behaviors that warrant such treatment, and second that they then engage in reward and/or punishment based on the behaviors (Hinkin & Schreisheim, 2008). In this sense, appropriate leadership behavior is dependent on higher-order cognitive functioning (for example, the ability to maintain attention and engage in self-regulation; Barkley, 1997). When leaders experience daytime sleepiness, executive functioning in general, and cognitive attention and self-regulatory behaviors more specifically, are comprised (Anonymous, 2017). This increases the likelihood of followers' positive behaviors going unnoticed and unrewarded, and negative behaviors being unnoticed and receiving no consequences (i.e., reward and/or punishment omission respectively). Research from several different areas supports this notion.

First, the notion that sleep loss has powerful negative effects is by no means new; Herbert Laslett (1928) concluded based on research conducted almost a century ago that "An individual's normal amount of sleep cannot be curtailed or eliminated without loss of efficiency" (1928, p. 370). What we now know is that sleep loss has powerful effects on cognitive and self-regulatory functioning (Barnes, 2012) that are critical for the enactment of high quality leadership (Anonymous, 2017). Sleep loss and poor sleep quality negatively affect executive functioning in the prefrontal cortex of the brain (Altena, Van Der Werf, Strijers, & Van Someren, 2008; Mullins et al., 2014; Thomas et al., 2000), which controls higher order cognitive abilities, such as planning, foresight, and problem solving (Mesulam, 1985). Thomas et al. (2000) and Mu et al. (2005) extend these findings, showing that 24 hours of sleep loss results in 7% deactivation of the whole brain, with greatest reduction in brain activity occurring in the prefrontal cortices. In separate studies, findings show that missing one night of sleep decreased executive functioning

in the area in the brain responsible for regulation of cognitions, emotions and behavior (Nilsson et al. 2005), and sleep loss compromises the function of neural pathways critical to attention allocation in tasks utilizing working memory (Smith, McEvoy & Gevins, 2002). Last, meta-analytic data directly link sleep deprivation to lapses in simple and complex attention, and processing speed (Lim & Dinges, 2010).

Second, impairment in higher order brain functioning caused by sleepiness has also been shown to negatively impact work-related outcomes relevant to leadership behaviors. For example, a lack of sleep leads to poor concentration at work (Wagner, Barnes, Lim, & Ferris, 2012), difficulty with organization (Dean et al., 2010), lower innovation and creativity (Wagner, Gais, Haider, Verleger, & Born, 2004), distrust of others (Anderson & Dickinson, 2010), prejudice (Ghumman & Barnes, 2013), interpersonally inappropriate (Kahn-Greene, Lipizzi, Conrad, Kamimori, & Killgore, 2006) and unethical behaviors (Barnes, Schaubroeck, Huth, & Ghumman, 2011). Lack of sleep also results in lower interpersonal functioning, including impatience (Swanson et al., 2011), reduced empathy toward others and poorer quality of interpersonal relationships, reduced impulse control and difficulty with delay of gratification (Killgore et al., 2008).

Third, several studies support the link between sleep problems and leadership quality in general, and passive leadership more specifically. Barnes, Lucianetti, Bhave, and Christian (2015) demonstrated that daily sleep quality affected daily abusive supervisory behaviors through ego depletion. In separate experimental studies, partial sleep deprivation was associated with less post-conventional moral reasoning (Olsen, Pallesen & Eid, 2010), and deep acting mediated the negative effects of sleep deprivation on charismatic leadership behaviors (Barnes, Guarana, Nauman, & Kong, 2016). More specific to a focus on passive leadership, Anonymous

(2017) showed that cognitive distraction predicted passive leadership (but not abusive supervision). More recently, a study of 16 military naval officers who were randomly assigned in counterbalanced order to a rested or partially sleep-deprived condition showed higher levels of passive-avoidant and laissez-faire leadership (and lower levels of transformational leadership) in the partially sleep-deprived condition (Olsen, Pallesen, Torsheim, & Espevik, 2016). Thus, we predict that:

Hypothesis 2: Daytime sleepiness predicts passive leadership

Indirect effects of ADHD on passive leadership through daytime sleepiness

We suggest that there is no direct link between adult ADHD symptoms and passive leadership. Instead, we predict that adult ADHD symptoms indirectly affect passive leadership through daytime sleepiness.

Hypothesis 3: ADHD predicts passive leadership through daytime sleepiness

Method

Recruitment and participants

Leaders and their followers were recruited from a list of senior managers who had attended executive development courses at a Canadian business school over a 2 years period. Emails were sent to over 2000 participants by the director of the executive development program informing them of the nature of the study and inviting their participation. One third of the original e-mails bounced back to the director (i.e., were not received by the respondents due to outdated e-mail addresses or spam protection programs). A week later, an e-mail with a link for of the survey was distributed by the researchers to all the working emails on the list. The email to leaders explained that as part of their participation, they would be asked to recruit at least one of their current followers to complete a survey as well. The leaders then invited their followers to

participate by providing at least one follower email at the end of their leadership survey, to the researchers, who then contacted these followers. 218 leaders completed the survey (resulting in a 17% response rate) and of those there was matched data for 98 leaders and followers (*M* follower per leader = 4.38, *SD* = 1.78), (follower response rate = 45%). Data were matched by having followers name their leader, followers then answered the questions based on that leader. Leaders only completed the leadership survey and had no access to what questions followers were asked.

Leaders' average age was 46.9 years old (*SD* = 6.2; 57 males, 32 females, 2 chose not to answer this question); 11% had attained a high school diploma, 7% a college diploma, 42 an undergraduate degree, and 39% had a graduate degree. The leaders had been with their organization for an average of 13.1 years (*SD* = 8.29). On average, followers were 43 years old (*SD* = 9.3; 50% males) and had been working for their leaders for 2.9 years (*SD* = 2.5).

Measures

Leaders provided data on their own ADHD symptoms and their daytime sleepiness.

ADHD symptoms. A six-item shortened version the 18-item Adult ADHD Self-Report Scale (ASRS; Kessler et al., 2005) was used to assess ADHD symptoms. This scale is used by the World Health Organization as a short screening scale for the general adult population (ASRS; Kessler et al., 2005). The short version has been shown to outperform the longer version in terms of sensitivity, specificity, and total classification accuracy when compared against clinical interview ratings (Kessler, 2005). This short form is a reliable, and cost-effective approach for gathering information about current symptoms in adults including college and university students (Gray, Woltering, Mawjee, & Tannock, 2014).

Each item asks about the frequency with which symptoms of adult ADHD had been experienced over the past 6 months (e.g., “how often do you make careless mistakes when you

have to work on a boring or difficult project?", "How often do you fidget or squirm with your hands or your feet when you have to sit down for a long time?"). Items were asked on a 4-point scale ranging from *rarely* to *almost always.* To examine individuals risk for ADHD we followed Kessler, Adler, Ames, Demler, et al. (2005) recommend a scoring system that creates three groups based on the number of items to which people responded affirmatively (indicating often or very often). Those indicating affirmative responses to four to six questions are considered "high risk" for ADHD and which has been shown to be correlated with actual diagnoses of ADHD (Kessler et al., 2005). In the current sample about 5% of the sample was in the "highest risk" category, which is within the estimated range of ADHD in the adult population (Kessler et al., 2006). Those indicating affirmative responses to two or three questions (34% in the current sample) were considered "moderate risk" and those indicating affirmative responses to none or one question were considered "low risk" for ADHD (61% in the current sample).

Daytime sleepiness. The 8-item Epworth Sleepiness Scale (ESS; Johns, 1991) was used to assess daytime sleepiness. ESS is a simple and reliable method for measuring persistent daytime sleepiness in adults (John, 1992). ESS scores are used clinically for the diagnosis of sleep apnea and ESS scores increase with the severity of sleep apnea (Johns, 1993). ESS scores provide a reliable measure of average sleep propensity (i.e., falling asleep), with more discriminating results than from all-day objective tests of daytime sleepiness such as the multiple sleep latency test (Johns, 2000). All items in this scale ask participants how likely they are to doze off or to fall asleep in different situations (i.e., sitting, reading). Items were asked on a 4-point scale ranging from *never doze* to *high chance of dozing*.

Followers rated their leader's passive leadership behaviors.

Passive leadership. Hinkin and Schriesheim's (2008) 4-item Reward Omission (e.g., "I often perform well in my job and still receive no praise from my manager") and 4-item Punishment Omission (e.g., "My manager gives me no feedback when I perform poorly") scales) was used to assess passive leadership. Items were measured on a 5-point Likert scale (1= "not at all", to 5 "frequently"). The two subscales were combined to form a global, 8-item Passive Leadership scale, with higher scores indicating more passive leadership. This scale exhibits appropriate construct validity, and is related to follower satisfaction with the leader, subordinate-rated leader effectiveness, subordinate-perceived role clarity, and supervisor-rated subordinate performance (Hinkin & Schriesheim, 2008).

Controls. Leaders' age was controlled as it is associated with sleep problems (Litwiller, Snyder, Taylor & Steele, 2017), and gender was controlled as it is associated with the prevalence of ADHD (Kessler et al., 2006) and laissez faire leadership (Eagly, Johannesen-Schmidt & van Engen, 2003). Depression and anxiety were controlled for due to their relationship with both sleep (Spoormaker & van den Bout, 2005) and ADHD (Kooij, 2013).

Depression symptoms. A ten-item shortened version the 20-item The Center for Epidemiologic Studies Depression Scale (CES-D-10; Radloff, 1997) was used to assess depression symptoms. The CES-D-10 is a widely used depression measure clinical settings and has demonstrated strong psychometric properties, including predictive accuracy and high correlations with the original 20-item version, in community populations (Björgvinsson, Kertz, Bigda-Peyton, McCoy, Aderka, 2013). Items were asked on a 4-point scale ranging from *rarely* to *almost always.*

Anxiety symptoms. The State-Trait Anxiety Inventory (STAI; Spielberger, 1983; Spielberger, 1989) was used to measure anxiety symptoms. Specifically, the 20-item Trait

Anxiety Inventory (STAI-T) was used to measure the stable propensity to experience anxiety. The STAI is one of the most long-standing and frequently used measures of anxiety, appearing in over 3000 studies and has been shown to have high discriminant and convergent and predictive validity (Spielberger, 1989). Items were asked on a 4-point scale ranging from *rarely* to *almost always.*

Results

We proposed an indirect effect model. The data were tested using standard OLS regression procedures as implemented through Hayes' PROCESS models (see Hayes, 2013). PROCESS is an observed variable OLS regression path analysis modeling tool for SPSS that is widely used in the social sciences for estimating direct and indirect effects in single and multiple mediator models (Hayes, 2018). Following Hayes' (2013) recommendations, unstandardized regression coefficients are reported throughout. Statistical significance of the indirect effects were evaluated using bias-corrected 95% confidence intervals (CI), with each analysis based upon 5,000 bootstrapped resamples (MacKinnon, Lockwood, & Williams, 2004). All analyses were implemented using SPSS23.

Before aggregating the ratings of each leader across the followers who rated their leadership behaviors (i.e., passive leadership), we calculated interrater reliability using ICC1, the proportion of total variance in a measure attributable to group membership and the extent to which raters are interchangeable, and ICC2, the reliability of the group means within a sample (Bliese, 2000; Klein & Kozlowski, 2000). For passive leadership, the average ICC1 was .43, and the average ICC2 was .86. The interrater reliability analyses provide sufficient evidence to support the aggregation of ratings across the followers for passive leadership.

Muthen (1999) suggests that it is not just the size of the intraclass correlations that is the issue, but rather it is also the size of the design effect, which is a function of the intraclass correlation and the average cluster size. A design effect > 2 indicates that the clustering in the data needs to be taken into account during estimation. The design effect is approximately equal to:

1 + (average cluster size - 1)*intraclass correlation.

The design effect for passive leadership in the current study is 1.37, indicating that aggregation is acceptable.

Descriptive statistics, intercorrelations and reliabilities (internal consistency) for all study variables appear in Table 1.

As can be seen from Table 2, Hypothesis 1 was supported: After controlling for leader age, gender, anxiety and depression, adult ADHD symptoms were associated with daytime sleepiness (Hypothesis 1; b = .32, *p* = .01, CI [.07, .58]). In turn, daytime sleepiness predicted passive leadership behaviors (Hypothesis 2; b = .22, *p* = .03, CI [.02, .41]). Last, the indirect effects of ADHD on passive leadership through daytime sleepiness was significant (Hypothesis 3; b = .07, se = .05, CI [.00, .20]). In contrast, the direct effect of ADHD on passive leadership were not significant (b = .06, se = .12, CI [-.18, .30].

Discussion

The goal of the present study was to examine whether and how adult ADHD symptoms influence passive leadership behavior. We posited and examined an indirect effects model in which adult ADHD symptoms are indirectly linked with passive leadership through their effects on daytime sleepiness. As hypothesized, ADHD predicted daytime sleepiness (Hypothesis 1) and in turn daytime sleepiness predicted the enactment of passive leadership (Hypothesis 2). Last,

there was a significant indirect effect of ADHD on passive leadership behaviors through daytime sleepiness (Hypothesis 3). These findings can be considered robust as they were obtained after controlling for leaders' age, gender, anxiety and depression.

Theoretical implications

This study adds to our understanding of the antecedents of leadership behavior in general, and the emerging research showing that leaders' psychological well-being indirectly influences their leadership behavior (Barling & Cloutier, 2017). This research contributes to the literature on the antecedents of leadership behavior and how ADHD symptoms indirectly affect leadership behavior. To our knowledge this is the first study to isolate the role of adult ADHD symptoms in the quality of leadership behaviors, specifically passive leadership. While much of the prior research has examined the outcome of laissez-faire and passive leadership on followers and the organization, the current study suggests a reason why leaders engage in passive leadership behavior in the first instance.

The findings from this study also contribute to literature on the interdependence of work and nonwork literature by testing the proposed framework of the relationship between daytime sleepiness and the workplace (Mullins et al., 2014). As suggested in the framework, daytime sleepiness mediated the indirect effect of ADHD symptoms work related outcomes (i.e. passive leadership. In doing so, our findings respond to the call for more research examining the relationship between ADHD and sleep in adults (Surman et al., 2009).

Strengths and Limitations of the Current Research

Methodologically, our study has several strengths that enhance the validity of the findings. First, we avoid problems associated with mono-source bias in leadership research by obtaining leaders' self-assessments of ADHD symptoms and daytime sleepiness, and followers'

ratings of their leaders' passive leadership behaviors. Second, we control for potential confounding variables in the indirect effects model (i.e., leader age, gender, depression and anxiety). Last, adult ADHD symptoms (i.e., ASRS; Kessler et al., 2005) and daytime sleepiness (ESS; Johns, 1991) were assessed with scales widely used in clinical contexts, providing some support for the external validity of the findings.

Like all research, however, our study also has several limitations that could compromise any inferences made from the findings. First, our study was cross-sectional, limiting the extent to which causal inferences can be made. Nonetheless, explanations involving reverse causality (e.g., passive leadership results in daytime sleepiness and/or ADHD symptoms) remain implausible. Second our focus in the current study was on sub-clinical levels of ADHD symptomatology, rather than diagnosed clinical cases of ADHD. One possibility is that by excluding the most extreme levels of ADHD, the resulting range restriction underestimate its real effects on passive leadership. Third, while we do control for potential confounding variables in this study (leader age, gender, anxiety and depression), it remains possible that the widespread comorbidity of ADHD is such that other confounding variables were not controlled. Last, greater attention to the nature of daytime sleepiness in samples of adults with ADHD is warranted given that waking brain activation patterns in individuals with ADHD are similar to those healthy individuals during REM sleep (Llewellyn, 2016) suggesting that ADHD mimics or exacerbate daytime sleepiness symptom expression (Kirov & Brand, 2014).

Directions for Future Research

As this is one of the first studies to examine the effects of adult ADHD symptoms on leadership behaviors, more research is needed examining how ADHD and other related mental disorders affect passive leadership. One potential route for future research in this area would be

to focus on a sample of individuals who have received a clinical diagnosis of ADHD, and those at varying levels of risk for ADHD; it is possible that doing so could yield stronger estimates of any indirect effects of ADHD. Although it is possible to derive categories of at risk for ADHD based on the Kessler et al. (2005) questionnaire, our sample size precluded this approach in this study[1]. It is also possible that given prevailing stigma, individuals with more extreme ADHD levels are not selected into leadership positions in the first instance, as a result of which contrasting leaders "with" ADHD and those who have not received a diagnosis could threaten the construct validity of the predictor variable.

Relatedly, recent research has shown the effects of internet-based cognitive behavioral treatments for insomnia (Barnes, Miller & Bostick, 2017) and CPAP devices for obstructive sleep apnea (Anonymous, 2017) on workplace behaviors. Future research might now investigate whether these or other treatments for sleep problems and sleep disorders (e.g., sleep hygiene, stimulant medication) might minimize the indirect effects of ADHD symptoms on passive leadership.

In the current study, we examined daytime sleepiness as the mechanism through which ADHD affects leadership behavior. Researchers may want to examine other potential mediating mechanisms for this relationship, such as the separate facets of executive functioning, and more specifically, self-regulatory behaviors. As well, future research should investigate the potential boundary conditions for this relationship. For example, could individual differences (i.e., conscientiousness) attenuate any effects of ADHD on passive leadership?

Another potential area for future research is examining the recursive relationship between psychological well-being, sleep and leadership behaviors. In the current study we found that mental illness, leads to daytime sleepiness which in turn leads to passive leadership. Other

studies have found that engaging in leadership behavior in and of itself is psychologically depleting (e.g., Arnold, Connelly, Walsh, & Martin Ginis, 2015). Thus, examining the potential for a reciprocal relationship between leadership behavior, psychological well-being and daytime sleepiness is a worthwhile endeavor.

Relatedly on the topic of psychological well-being it may be worthwhile to examine contextual variables relating to employee and leader psychological well-being. For example, how does the climate of the organization impact mental health. Since its conceptualization, the climate construct has shifted its focus from initially being general in nature to progressively concentrating on a climate "for something" (Schneider, Ehrhart, & Macey, 2013), such as pro-environmental climate (Norton, Zacher & Ashkanasy, 2012), and safety climate (Zohar, 2010). Thus does having an organizational climate "for mental health" positively affect leaders and employees psychological well-being? Previous research suggests having a good general organizational climate reduces levels of burnout, depression, and anxiety (Bronkhorst, Tummers, Steijn & Vijverberg, 2015). Other situational factors future research should take account are ones that might affect daytime sleepiness (e.g. over the counter and prescription medication usage; Mullins et al., 2014) and passive leadership (e.g., number of employees supervised; Mullen, Symons, Hu, & Salas, 1989).

Future research should investigate whether adult ADHD symptoms indirectly influence other leadership behaviors. As noted earlier, sleep deprivation resulted indirectly in lower levels of charismatic leadership (Barnes et al., 2016). Future research could investigate whether leaders with ADHD who are experiencing daytime sleepiness might also be prone to unethical behaviors (Olsen et al, 2010), or to abusive supervision through lowered self-regulatory behaviors (Kiewitz et al., 2012). Last, we focused on the antecedents of passive leadership in the current study. It is

possible, however, that the reasons underlying reward and punishment omission differ somewhat. For example, the potential conflict associated with confronting followers for poor performance might require greater levels of cognitive and affective resources on the part of the leader, such as that they could be differentially affected by daytime sleepiness, or other indicators of psychological well-being. Pursuing some of these questions would help to begin to develop an understanding of the antecedents of reward and punishment omission specifically, and passive leadership more generally.

Organizational and Policy Implications

Given accumulating research findings (e.g., Byrne et al., 2014; Luria, Kalish, & Weinstein, 2014), that leaders' psychological well-being or disorder affects their leadership, organizations need to recognize the mental health of their leaders as an issue of importance for leadership quality and overall organizational functioning (Barling & Cloutier, 2017). Considering the current findings, this raises daunting policy and intervention dilemmas. First, do organizations have a right to know about any issues that could interfere with their leaders' performance? In the case of the most senior leadership of publicly traded companies, the answer to this question is that shareholders have a right to know of any factors that could affect the financial performance and value of the organization. But such obligations do not apply to most organizational leaders.

Nonetheless, organizations cannot provide appropriate the necessary supports if they remain unaware what specific issues their leaders are facing. This raises a significant issue, as self-identifying with any form of mental illness introduces the prospects of stigmatization. As an example of this with respect to leadership, Luria et al. (2014) showed that although there were no differences in effectiveness between leaders with and without a learning disability, employees

with a learning disability were significantly less likely to attain a leadership position, raising the possibility of a bias against those with a learning disability and other forms of mental disorders.

Given this, the current findings show that ADHD symptoms were not directly linked with passive leadership; instead, daytime sleepiness was the proximal antecedent of passive leadership removing any need for leaders to self-identify with ADHD. Thus, organizations can best affect the indirect effects of leaders' ADHD symptoms on passive leadership by helping to limit the sleep problems that result in daytime sleepiness. Although concern is often expressed that doing so would consume valuable organizational resources (e.g., Litwiller et al., 2017), this is not necessarily the case: Recent research endorses the indirect effects of low-cost, internet-based cognitive behavioral therapy for insomnia on interpersonal deviance and organizational citizenship at work (Barnes et al., 2017) and readily-accessible, validated treatments for obstructive sleep apnea (Anonymous, 2017) on work withdrawal (e.g., cognitive distraction, partial absenteeism).

Conclusion

We have a limited understanding of how leader's own mental health/disability affects their leadership behaviors. We do however know that individuals are not invulnerable to the effects of mental disabilities on behavior. This study shows the effect of one mental disorder, namely ADHD on passive leadership behavior and the mechanism through which ADHD its effects on passive leadership, daytime sleepiness.

Footnote

[1]The number of people categorized as high risk (n = 5), medium (n = 33) or low (n = 60) reflected the prevalence of adult ADHD.

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Table 1.

Descriptive statistics and intercorrelations for all study variables (N = 93-98)

	M	*SD*	1	2	3	4	5	6	7
1. Gender	1.43	0.54							
2. Age	46.9	6.18	-.20						
3. Anxiety	1.69	0.42	-.14	-.08	**.91**				
4. Depression	1.54	0.40	.18	-.12	.72**	**.76**			
5. ADHD symptoms	1.86	0.41	.07	-.10	.45**	**.**38**	**.79**		
6. Daytime sleepiness	1.70	0.43	-.05	-.11	.05	.13	.30**	**.70**	
7. Passive leadership	2.37	0.39	-.17	.09	-.03	-.11	.08	.22*	**.89**

Note. Cronbach's alpha indicated on the diagonal using boldface

*$p < .05$; **$p < .01$

Table 2. *Conditional indirect effects of ADHD on passive leadership through daytime sleepiness* (N = 93 dyads).

Mediator variable: Daytime Sleepiness					
Predictor	**b**	**SE**	**t**	**LLCI**	**ULCI**
ADHD symptoms	.32	.12	2.54*	.070	.557
Gender	-.07	.09	-.83	-.250	.103
Age	-.01	.01	-.96	-.022	.008
Anxiety	-.20	.16	-1.26	-.504	.113
Depression	.17	.16	1.09	-.141	.485
Model summary: R^2 = .179, F(5,87) = 2.02, p = .083					
Outcome variable: Passive Leadership					
Daytime sleepiness	.22	.10	2.20*	.021	.411
ADHD symptoms	.06	.12	.15	-.182	.298
Gender	-.13	.08	1.59	-.290	.034
Age	.01	.01	.67	-.009	.018
Anxiety	.08	.14	.54	-.206	.364
Depression	-.19	.14	-1.31	-.478	.098
Model summary: R^2 = .150, F(6,86) = 1.91, p = .088					
Indirect effect: Passive leadership					
ADHD – Passive leadership via Daytime sleepiness	.07	.05		.004	.204

Note. Unstandardized regression coefficients reported throughout

* $p < .05$