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Sleeping to Support: An Examination of the Relationship Between Leader Sleep and Positive Support Behaviors

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by

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Abstract

Although research has documented the relationship between sleep and workplace outcomes among general employees, less research has focused on the role of sleep among workplace leaders. Drawing from the work, nonwork, and sleep theoretical model (Crain et al., 2018), the current study investigates emotional exhaustion the link between leader self-reported sleep quantity on a constellation of positive leader support behaviors (i.e., general supervisor support, family supportive supervisor behaviors (FSSB), and sleep leadership) rated by both the leader and their direct employee. Finally, to gain a deeper understanding of the role of sleep in these relationships, this study examines the interaction between sleep quantity and quality on emotional exhaustion. Overall, I hypothesized that leader sleep quality at Time 1 will moderate the indirect effect of leader sleep quantity at Time 1 on general supervisor support, FSSB, and sleep leadership at Time 3 via emotional exhaustion at Time 2. Results indicated that no hypotheses from this study were supported. However, unexpected findings suggested significant direct effects from leader emotional exhaustion at Time 2 to employee-ratings of general supervisor support, FSSB, and sleep leadership at Time 3. Results also revealed a significant moderating effect of leader insomnia symptoms at Time 1 on the relationship between leader sleep duration at Time 1 and employee-ratings of sleep leadership at Time 3, as well as employee-ratings of FSSB at Time 3. Finally, there was a significant moderating effect of leader sleep dissatisfaction at Time 1 on the relationship between leader sleep duration at Time 1 and leader-ratings of sleep leadership at Time 3. Results from this study may inform future workplace interventions aimed at promoting positive

leader support behaviors as well as public health campaigns focused on improving sleep health.

Keywords: sleep, leaders, social support, emotional exhaustion, FSSB, sleep leadership

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Introduction

Today's competitive workplace culture perpetuates the unhealthy belief that successful leaders do not sleep. This is reflected in many first-hand accounts from well-known leaders, such as Bill Gates and Margaret Thatcher, who have admitted to previously neglecting sleep to gain a competitive advantage as a leader or to make progress on their tasks (Gates, 2019; Lashbrooke, 2020). Past United States presidents have also been known to engage in similar behaviors. For example, Barack Obama was notorious for working instead of sleeping during his presidency (Berger, 2018; Shear, 2016), and Donald Trump has been quoted as saying that he "never sleeps and that people who sleep are lazy" (Le, 2019; Smith, 2017). Moreover, the current United States President, Joe Biden, infamously fell asleep during President Obama's debt speech in 2011, and Vice President Kamala Harris mentioned in a precampaign interview that she does not get "nearly enough" sleep (New York Times, 2019). In fact, in the same interview, almost all the Democratic candidates for the 2020 presidential election mentioned that they do not get enough sleep (New York Times, 2019).

These anecdotes are supported by the organizational literature, which suggests that individuals believe getting less sleep is related to career success, such that participants assumed successful leaders slept less than the average worker (Svetieva et al., 2017). Other studies confirm this harmful culture, as the shortest sleep durations and highest fatigue are experienced by supervisor-level employees as opposed to lower-level employees (e.g., Åkerstedt et al., 2004; Jackson et al., 2013; Luckhaupt et al., 2010; Svetieva et al., 2017; Ursin et al., 2009;), indicating that unhealthy sleep beliefs and

attitudes are perpetuated by workplace leaders. This broader societal trend is reflected in a survey conducted by the United States Bureau of Labor Statistics, which identified paid work time as the primary waking activity exchanged for sleep (Basner et al., 2014). Specifically, workplace leaders are more likely to increase hours at work at the cost of their personal time (e.g., sleep) (Babbar & Aspelin, 1998; Ruderman et al., 2017). Taken together, these studies highlight a national concern related to leaders and chronic sleep restriction (i.e., consistently obtaining less than ideal amounts of sleep).

For the average adult, the American Academy of Sleep Medicine, the Sleep Research Society, and the National Sleep Foundation recommend a minimum of 7 hours of sleep per night and high levels of quality sleep on a regular basis for optimal health and functioning (Hirshkowitz et al., 2015; Ohayon et al., 2017; Watson et al., 2015). Recently, a study conducted by the Centers for Disease Control and Prevention uncovered that over one third of Americans (approximately 83.6 million US adults) regularly do not obtain the recommended amount of sleep (Liu et al., 2016). Sleep restriction can be quite damaging for the worker, the organization, and society, given its prevalence and associated consequences. Past work has identified sleep as a major contributor to health outcomes such as depression, anxiety, depersonalization, and emotional exhaustion, as well as broader organizational outcomes such as engagement, performance, safety, absenteeism, and job satisfaction (e.g., Barnes & Watson, 2019; Litwiller et al., 2017). Consequently, approximately 1.2 million working days are lost in the United States each year due to inadequate sleep (Hafner, 2017; Shockey & Wheaton, 2017). Sleep restriction can also have a substantial monetary impact. For example,

nationwide estimates of the economic cost of sleep deficiency reach $411 billion dollars annually in medical and work-related expenses, translating to 2.3% of the United States gross domestic product (Hafner, 2017; Kiley et al., 2019). Unfortunately, however, research on the potential consequences of sleep restriction within the workplace leader population has been largely neglected.

Reviews and meta-analyses examining sleep in the workplace demonstrate the field's narrow focus on the general employee (Khubchandani & Price, 2020), rather than leaders. For example, two recent meta-analyses empirically examined the impact of sleep on work outcomes and work performance for general employees, ignoring level within the organization (Henderson & Horan, 2021; Litwiller et al., 2017). Furthermore, Van Laethem and colleagues (2013) conducted a systematic review of the longitudinal intervention literature on psychosocial stressors and sleep quality among working individuals, but not necessarily leaders. Barnes (2012) reviews and integrates self-regulation research with sleep research, focusing on employee sleep and work outcomes, also disregarding level within the organization. Another example includes a meta-analysis that examined sleep problems and safety outcomes among a general working population (Uehli et al., 2014). Although understanding the relationship between sleep and work outcomes among general employees is important, researchers have called for further examination of the link between sleep and performance among leaders in the workplace (e.g., Gaultney, 2014; Rogers et al., 2019). Leader attitudes, behaviors, and decisions are likely to have substantial consequences and can impact many people, due to leaders' positions within the organization (Ruderman et al., 2017; Kaluza et al., 2021).

Thus, it is essential to consider how sleep is linked to a leader's ability to engage in their unique job tasks, as they may be more susceptible to experiencing sleep loss. Well-rested leaders are vital to the overall success of employees and organizations.

Recently, individual studies have started to examine the relationship between sleep and various leadership outcomes. Leadership refers to the process by which leaders influence their followers (Antonakis & Day, 2018; Bass & Bass, 2008; Schonfeld & Chang, 2017; Truxillo et al., 2015). For example, leadership could look like establishing a vision, ensuring cooperation, and changing follower perceptions and actions. Researchers suggest that variability in abusive leadership (i.e., hostile verbal and nonverbal behavior) can be attributed to poor sleep quality (i.e., feeling rested, ability to fall and stay asleep) (Barnes et al., 2015; Tariq et al., 2019). Additionally, sleep deprivation increases a leader's tendency to neglect and avoid responsibilities associated with their leadership role (Olsen et al., 2016). This subset of literature, however, is overwhelmingly focused on potential *negative* leadership outcomes of leader sleep. Few exceptions examine leader sleep and subsequent positive leadership styles such as charismatic leadership (i.e., leaders who engage and inspire followers to believe their group's mission is extraordinary; Conger et al., 2000) and transformational leadership (i.e., leaders who encourage and empower followers to grow and achieve individual and collective goals; Barnes et al., 2016; Bass & Riggio, 2010; Byrne et al., 2014; Olsen et al., 2016). Although organizational research is beginning to examine sleep as an influential factor in leadership, less is known regarding the role of sleep in a leader's

ability to provide *positive* behaviors in the workplace, and not just an absence of negative behaviors.

To this end, it is important to understand how leader sleep is linked with the related, yet distinct construct of leader support. Support is one of the many behaviors a successful, high-quality leader must engage in (e.g., van Dam & van der Helm, 2016), but it is not often captured in broad leadership definitions. A related line of research has begun to examine the connection between supervisor support and sleep. Specifically, various studies have demonstrated that leader support can improve employee sleep (e.g., Berkman et al., 2010; Crain et al., 2014; Sianoja et al., 2020). Although important, this line of research ignores how a leader's own sleep is linked to their ability to provide positive supportive behaviors. It is important to examine leader support as previous research suggests that it is especially beneficial for employees and the organization (e.g., Hammer et al., 2009; Hammer et al., 2013; Kelloway et al., 2017; Koch & Binneweis, 2015; Las Heras et al., 2015). However, antecedents of these positive leader behaviors have largely been overlooked (e.g., Crain & Stevens, 2018; Byrne et al., 2014). This raises a crucial question for the productivity and environment of the workplace: how can leaders support and ensure the well-being of their employees if they are suffering from the consequences of sleep restriction themselves? Due to the well-established benefits of leader support behaviors, it is essential for researchers and practitioners to understand how to promote and maintain these supportive behaviors amongst leaders.

Although leaders are vital to the improvement of organizational and employee level outcomes, past literature has failed to consider precursors to positive leader support

behaviors. Specifically, there are three types of support behaviors particularly relevant to this study: *general supervisor support* (i.e., expressions of care and concern by the leader or tangible assistance provided to their employees; House, 1981; Kossek et al., 2011), *family-supportive supervisor behaviors (FSSB)* (i.e., behaviors exhibited by leaders that assist employees in managing family and nonwork demands; Hammer et al., 2009), and *sleep leadership* (i.e., behaviors that aid employees in obtaining more and/or better sleep and reflect concern for employee sleep; Gunia et al., 2015). Each of these positive leader support behaviors address a different domain of employees' lives; general supervisor support is broad and focuses on support within the workplace, FSSB is comprised of support behaviors for nonwork demands, and sleep leadership refers to support for employee sleep health. Thus, this study aims to advance this conversation by examining leader sleep as an antecedent to an intentionally chosen set of distinct, yet important positive leader support behaviors in the workplace.

Within the limited research that has examined the relationship between leader sleep and subsequent behavior, few studies have explored potential mechanisms by which this relationship occurs. The most popular explanation in past research suggests that resources are the mechanisms connecting sleep to downstream outcomes (e.g., Barnes, 2012; Barnes et al., 2015; Baumeister, 2003). Criticism of resource-based mechanisms, however, are that they may be too broad (e.g., "nearly anything good can be considered a resource"; Halbesleben et al., 2014, p. 1337), prohibiting research and practice from advancing (e.g., Friese et al., 2019; Thompson & Cooper, 2001). Thus, research is needed to identify more specific resources that may be at play in the relationship between sleep

and leader behavior. Specifically, the present study explores emotional exhaustion as a critical explanatory mechanism. Emotional exhaustion is the core dimension of burnout and refers to a particularly chronic, affective form of work-related strain which can look like fatigue, job-related depression, psychosomatic complaints, and anxiety (Demerouti et al., 2001; Gaines & Jermier, 1983; Wright & Cropanzano, 1998). It is important to understand emotional exhaustion's role in the workplace as studies have shown that it can impact major organizational outcomes such as job performance, organizational citizenship behaviors, and turnover intentions (e.g., Cropanzano et al., 2003). Outside of these main outcomes, little is known about how emotional exhaustion can impact specific facets of performance, such as positive support behaviors amongst leaders.

Anticipated Contributions

The present study provides three theoretical contributions to the current organizational health literature. First, research is limited when it comes to examining the relationship between sleep and a leaders' ability to provide positive support behaviors. Understanding how to mitigate negative leader behaviors at work is crucial, but only focusing on prevention is too narrow. By examining positive behaviors, we can also learn how to *promote* positive leader support behaviors that can drive employees and organizations towards a healthier and more successful future (e.g., Hämming, 2017; Kossek et al., 2011; Mor Barak et al., 2009). Thus, this will be the first study to examine leader sleep as an antecedent to positive leader support behaviors, specifically general supervisor support, FSSB, and sleep leadership. Furthermore, the incorporation of a constellation of support behaviors as outcomes is a unique feature of this study. The

limited research on this topic typically examines one form of leader behavior as an outcome to leader sleep. For example, Barnes and colleagues (2020) examined unethical leadership as the sole leader-level outcome. Other examples of independent outcomes include abusive supervision (Barnes et al., 2015; Tariq et al., 2019) or hostile leader behavior (Guarana & Barnes, 2017). An example of an exception is a study conducted by Olsen and colleagues (2016) that examines the impact of leader sleep and subsequent transformational and transactional leadership styles. In contrast, the present study will contribute to research by examining multiple specific, positive leader support constructs (general supervisor support, FSSB, and sleep leadership) as outcomes of leader sleep. Examining only one type of leader behavior as an outcome is an oversimplification to the complexity of leader behavior in the workplace. It is theoretically important to assess a constellation of leader behaviors because we can obtain a more realistic picture of positive leader behavior by including its many different forms. Additionally, this constellation would tell researchers whether nonwork domain or work domain support may be more effortful for leaders to provide when suffering from sleep restriction; are leaders more likely to abandon one form of support over the other when suffering from sleep restriction? From a practical standpoint, examining a constellation of positive leader behaviors informs future interventions aimed at promoting a specific type of positive leader behavior. For example, if FSSB is valued and found to be particularly susceptible to sleep loss, organizations should consider implementing policies and procedures that protect and promote healthy sleep among the leader population.

Second, due to the role of sleep in replenishing resources needed for daily activity, past studies suggest resource-based mechanisms as the linkage between sleep and subsequent leader behavior. Much of the research indicates that ego depletion (i.e., the fluctuation in our ability to resist urges and impulses due to a depletion in resources) is the explanatory process (e.g., Barnes et al., 2011; Barnes et al., 2015). The principal assumption of ego depletion theory is that as resources are lost, a state of depletion ensues that makes the person incapable or unwilling to exert control over their behaviors (Baumeister & Vohs, 2007). This line of literature, however, has faced extensive criticism suggesting that utilization of ego depletion as a theoretical framework contributes to the replicability crisis as it is too ambiguous and does not identify the specific resources at play (Hagger et al., 2010; Inzlicht & Friese, 2019; Lurquin et al., 2016; Lurquin & Miyake, 2017). Furthermore, the vagueness of ego depletion leads to potentially unfalsifiable results because anything could be considered a resource (Halbesleben et al., 2014; Lurquin & Miyake, 2017). This criticism is parallel to critiques of other resource-based theories such as conservation of resources (COR) theory (Hobfoll, 1989), in which the principal assumption is that humans strive to always protect and obtain “resources”, resulting in strain when such resources are lost. Resource-based theories such as ego-depletion and COR have consistently been used to argue for sleep-driven relationships in the workplace in past studies (e.g., Barber et al., 2012; Crain et al., 2014; Sianoja et al., 2020). Following this widespread evaluation of resource-based theories, researchers have called for increased specificity and preciseness when employing resource theories such as ego depletion (Friese et al., 2019). By specifying the

resource at play in these relationships, sleep and organizational literature can progress and practitioners can be better informed on how to better support sleep in the workplace (Halbesleben et al., 2014; Lurquin & Miyake, 2017). To address such limitations of past literature, this study will utilize a newer, more detailed theoretical model to explicitly test the resources at play in the hypothesized relationships (Crain et al., 2018). Therefore, this study contributes to the literature by hypothesizing that emotional exhaustion is a mediating mechanism in the relationship between leader sleep and subsequent leader behavior outcomes.

The third contribution of the present study is the examination of the interaction between leader sleep quantity and sleep quality as predictors of emotional exhaustion and downstream leader support behaviors. Research has demonstrated that the correlations between sleep quantity and quality are often small and nonsignificant, adding to the argument that they should be assessed as distinct constructs (e.g., Barnes, 2012; Brossoit et al., 2019; Crain et al., 2018; Litwiller et al., 2017). From this, recent work has documented a potential interaction between sleep quantity and sleep quality (Barber et al., 2010; Barnes et al., 2015). It is important to examine the potential interaction between sleep quantity and sleep quality as it may demonstrate their combined relationship to downstream leader behaviors, lending information to scientists and practitioners about how to consider sleep quantity and quality in tandem in workplace interventions. On a broader scale, gathering empirical evidence regarding the sleep quality and sleep quantity interaction could provide a new approach for public health campaigns as most campaigns currently emphasize getting at least 7 hours of sleep per

night (i.e., sleep duration) to maintain adequate functioning. Examples include sleepeducation.org which provides a bedtime calculator and a "7 and up" campaign related to sleep duration as well as suggestions for making time to sleep as part of the National Healthy Sleep Awareness Project (American Academy of Sleep Medicine, 2021). Moreover, the U.S. Department of Health & Human Services launched the "HealthyPeople2030" campaign that almost exclusively focuses on improving sleep duration (United States Department of Health and Human Services, 2020). Another example includes the annual Sleep Awareness Week which is hosted by the National Sleep Foundation the week that Daylight Savings Time occurs, and people lose an hour of the day, thereby placing focus on duration (National Sleep Foundation, 2021). However, if enough empirical studies suggest sleep quality may play a bigger role than we previously thought, these campaigns could place more emphasis on promoting health information related to sleep quality. Additionally, the interactive relationship between sleep quantity and quality is relatively new, and outcomes studied have been ego depletion or psychological strain (Barber et al., 2010; Barnes et al., 2015). Thus, exploration of this interaction's impact on other outcomes is necessary. In response to calls for further examination of this interaction effect (Barber et al., 2010; Crain et al., 2018), this study will extend the literature on this interaction between sleep quantity and quality by examining emotional exhaustion as a potential outcome.

Finally, this study makes a methodological contribution to the organizational literature by including both employee and supervisor self-ratings of sleep leadership and FSSB outcomes. Utilizing both leader self-ratings and the ratings of their direct

employees as multiple sources of information about the same constructs will avoid inflated correlations commonly found in same source data (Podsakoff et al., 2003; Podsakoff et al., 2012). Similarly, the ratings may be less susceptible to self-report bias from the supervisors. In addition, given the longitudinal nature of the study with measurements taken at baseline (Time 1), four months post-intervention (Time 2), and nine months post-baseline (Time 3), common method bias is less likely to play a role in the significance of the results (Podsakoff et al., 2003; Podsakoff et al., 2012). Moreover, this methodological design may also provide theoretical insights to the current leadership and occupational health literatures. For example, how do employees and leader perceptions of support differ? Do employees perceive their leader as being more supportive of their work (general supervisor support), nonwork (FSSB), and sleep (sleep leadership) when the leader is getting sufficient and good quality sleep and experiencing less emotional exhaustion? Therefore, the inclusion of multiple sources of information, specifically leader and employee ratings of two outcomes (i.e., FSSB, sleep leadership), has methodological as well as theoretical advantages.

In the following sections, I introduce the work, nonwork, and sleep (WNS) model as the theoretical foundation for understanding the connection between leader sleep to subsequent workplace behaviors (Crain et al., 2018). Additionally, I highlight Quinn and colleagues (2012) taxonomy of human energy to propose emotional exhaustion as a mediating mechanism. In the following sections, I review the relevant lines of research to support the specific proposed hypotheses between leader sleep, emotional exhaustion, and downstream positive support behaviors. See Figure 1 for the conceptual model.

Theoretical Rationale

To help explain the hypothesized relationship between leader sleep and subsequent support behaviors, I draw from Crain and colleagues (2018) theoretical model which identifies the underlying processes that link the three domains of employees' lives: work, nonwork, and sleep (WNS). The WNS model suggests that sleep plays a major influential role in our attitudes, behaviors, and states for both the work and nonwork domain. The present study focuses on the role of sleep in emotional health and downstream positive behaviors in the work domain and thus, I diverge from past definitions of sleep that typically focus on deficiencies and move toward a more positive definition of sleep to highlight its role in health and well-being by utilizing Buysse's (2014) definition of sleep health. Historically, organizational research examining sleep has broadly looked at sleep quantity and quality as core dimensions (Barnes, 2012). In contrast, Buysse (2014) suggests that sleep health is multidimensional in nature and more nuanced, meaning that there are different components that make up "good" sleep. Specifically, sleep health consists of key dimensions including sleep duration (i.e., total amount of sleep obtained in each 24-hour period), sleep satisfaction (i.e., one's subjective evaluation of whether they obtained "good" or "bad" sleep), sleep efficiency (i.e., how easy it is to fall and stay asleep), and sleep timing (i.e., placement of sleep within a 24-hour period) (Buysse, 2014). For the purposes of the present study, I examine sleep duration as the core dimension reflecting sleep quantity, and sleep satisfaction and insomnia symptoms (equivalent to sleep efficiency) as dimensions of the broader construct of sleep quality. Beyond examining a mediating effect, this study incorporates

other recommendations from the WNS theoretical framework. Crain and colleagues (2018) suggest that an interaction effect may occur between sleep quantity and quality. Few studies have examined such an interaction thus far (Barber et al., 2010; Barnes et al., 2015). Consequently, further exploration into this effect has been recommended by researchers (Crain et al., 2018). In accordance with this recommendation and to advance this discussion, this study will examine the interaction of sleep quality and sleep quantity on subsequent emotional exhaustion and subsequent work behaviors.

The main proposition of the WNS model indicates that sleep influences work behaviors via energy resources. To address criticisms of past theories, which have conceptualized resources broadly and without much specification (e.g., ego depletion or COR; Ganster & Rosen, 2013), the WNS model builds off Quinn and colleagues' (2012) taxonomy of human energy to posit that sleep influences behaviors, attitudes, and states via fluctuations in two specific types of energy resources: physical energy and energetic activation. Quinn and colleagues (2012, p.341) define *physical energy* as "the capacity to work". In other words, it is the physiological energy needed to do, to move, and to think (Quinn et al., 2012). In contrast, *energetic activation* represents an individual's appraisal or feeling of being energized, full of vigor, enthusiasm, or zest which is observable in subsequent affective outcomes (Quinn et al., 2012). In the current study, I focus specifically on energetic activation as one type of energy resource directly influenced by sleep. Crain and colleagues (2018) posit that sleep quantity and quality are resources that can produce other resources, particularly energetic activation such that sleep quantity and quality have a positive relationship with energetic activation.

Researchers have indicated a clear linkage between energetic activation and emotional exhaustion, which is a core component of burnout (Quinn et al., 2012l; Wright & Cropanzano, 1998). Seminal work on this construct defines emotional exhaustion as a chronic state of emotional and physical depletion and *feelings* of being overextended (Cropanzano et al., 2003; Masclach et al., 2001; Maslach & Jackson, 1984). This definition suggests that emotional exhaustion has a close relationship with energetic activation due to the shared emphasis on affect as well as individual appraisal. Specifically, emotional exhaustion is an indication or symptom of low energetic activation. These constructs are related yet distinct as energetic activation is the resource that can lead to experiences of emotional exhaustion as a state. Therefore, fluctuations in sleep quantity and quality should result in a subsequent gain or loss of energetic activation that may be evident via emotional exhaustion.

Furthermore, Crain and colleagues (2018) propose that energetic activation positively influences behaviors in the workplace. Of relevance to this study, the WNS model indicates that energetic activation may act as a linking mechanism through which sleep affects work domain behaviors (Crain et al., 2018). For example, past studies suggest that workplace behaviors, such as performance, helping behaviors, and engagement may be influenced by the generation of positive affective resources such as energetic activation (Brief & Weiss, 2002; Crain et al., 2018). Thus, the present study aims to identify how emotional exhaustion may be associated with later workplace behaviors exhibited by leaders, namely general supervisor support, FSSB, and sleep leadership.

Crain and colleagues (2018) also suggest that the relationships that are theorized in the WNS model between work, nonwork, and sleep are likely to take place over time. Due to the nature of sleep, it can have both immediate and long-term effects (Litwiller et al., 2017). Research in the cognitive neuroscience domain has demonstrated the crucial role of sleep in long-term brain changes (i.e., plasticity) (Carskadon & Dement, 2011), which has subsequently been shown to influence behavior at a later time point (e.g., Kolb, 1995; Kolb & Gibb, 2014; Kolb et al., 2003). The sleep literature also indicates that the effects of sleep accumulate over time, growing worse as sleep restriction continues (Barnes, 2012). Thus, research suggests that assessing sleep-related relationships longitudinally is more likely to reflect meaningful brain changes and the subsequent changes in behavior (Kolb & Gibb, 2014). In response to this information, Crain and colleagues (2018) have called for longitudinal (e.g., intervals over months as opposed to days) designs in organizational sleep research. Furthermore, specific calls for increased longitudinal sleep research have also been made (Litwiller et al., 2017) to further our understanding of the dynamic long-term processes underpinning the association between sleep and downstream outcomes. Thus, in accordance with such recommendations, this study examines the hypothesized relationships over time. Specifically, I expect that leaders who obtain sufficient sleep quantity at Time 1 will experience less emotional exhaustion at Time 2, resulting in increased positive leader support behaviors at Time 3.

The Relationship Between Sleep Quantity and Support Behaviors

The first aim of this study is to establish a link between sleep quantity and downstream support behaviors. The WNS theoretical framework suggests that sleep

influences subsequent behaviors in the work domain via energy-based resources (Crain et al., 2018). Crain and colleagues (2018) suggest that sleep is a key contributor to fluctuations in human energy, and such energy is necessary for a leader's ability to engage in downstream positive support behaviors in the workplace. Prior work has begun to establish a link between sleep quantity and leader performance outcomes. For example, Gauntley (2014) suggests that leaders with inconsistencies between their weekend and weekday sleep duration subsequently receive lower performance ratings from their peers. Leaders are also more likely to engage in passive avoidant leadership – particularly lassiez-faire (i.e., leaders who are generally absent when needed; Bass & Riggio, 2010) – when they are sleep deprived (Olsen et al., 2016). Furthermore, sleep deprived leaders are less likely to demonstrate transformational leadership (Olsen et al., 2016). Such studies support the fundamental proposition from the WNS theoretical framework that sleep quantity can have an impact on downstream work behaviors for leaders (Crain et al., 2018).

Although research has demonstrated links between leader sleep and subsequent leadership outcomes, it is also important to examine leader support. There are key differences between leadership and support. Primarily, leadership has been conceptualized as a process whereas support is considered a specific behavior (Antonakis & Day, 2018; Hammer et al., 2009). Leadership has been referred to as the way a leader directs a team, group, or organization to meet a certain collective goal (Hogan & Kaiser, 2005) whereas support is more likely to occur on an individual level between the leader-employee dyad. Additionally, leadership may be negative (e.g., abusive supervision) or

positive (e.g., charismatic leadership), but support is generally a positive and beneficial behavior. Overall, support from leaders is a fundamental need, regardless of leadership style, and this has been demonstrated by empirical research. For example, support from leaders has been shown to lead to a myriad of beneficial outcomes such as increased employee creativity (e.g., Cheung & Wong., 2011), reduced work-to-family conflict and family-to-work conflict (e.g., Lapierre & Allen, 2006; Muse & Pichler, 2011), better employee sleep (e.g., Sianoja et al., 2020), higher job satisfaction (e.g., Odle-Dusseau et al., 2012) and work engagement (e.g., May et al., 2004; Xu et al., 2011)., as well as lower turnover intentions (e.g., Nohe & Sonntag, 2014) Thus, support is a crucial and valuable component of leadership that is worth examining separately to identify how to maintain and promote such behaviors in the workplace.

General Supervisor Support

This study assesses sleep quantity's impact on three support behaviors: general supervisor support, family-supportive supervisor behaviors (FSSB), and sleep leadership. General supervisor support refers to leader behaviors that are primarily supporting an employee's effectiveness at work. Specifically, general supervisor support refers to behaviors such as providing tangible assistance and services (i.e., instrumental support) and demonstrating empathy, encouragement, care, and trust (i.e., emotional support) to their employees in the workplace (House, 1981; Langford et al., 1997; Mathieu et al., 2019; Yoon & Thye, 2000). Past literature has emphasized the importance of promoting general supervisor support in the workplace as it has been shown to decrease worker anxiety, depression, somatic complaints, emotional exhaustion, turnover, among many

other outcomes (Haas et al., 2020; Mor Barak et al., 2009; O'Driscoll et al., 2003; Siebert, 2006). Sleep is likely to impact a leader's propensity for engaging in general supervisor support as it requires energy and effort to provide instrumental and emotional support to a team of employees. For example, a leader who gets more sleep is likely to demonstrate encouragement and care to their employees as well as have the resources necessary for providing assistance. Thus, it is hypothesized that sleep quantity will be linked to downstream employee-related general supervisor support (See Figure 1).

Hypothesis 1: Leader sleep quantity at Time 1 will have a positive relationship with employee reports of general supervisor support at Time 3.

Family-Supportive Supervisor Behaviors

In contrast to general supervisor support, the construct of FSSB places emphasis on leaders supporting their employee's nonwork demands. FSSB is conceptualized as domain-specific leader behaviors that enable the employee to be successful in both their work and nonwork lives (Crain & Stevens, 2018; Hammer et al., 2009). For example, FSSB might include behaviors such as demonstrating care for employees' nonwork life, providing resources to help with demands, demonstrating effective balancing of one's own work and nonwork tasks, or proactive efforts to strengthen employees' ability to manage their work and nonwork demands (Hammer et al., 2011). According to a recent review, FSSB can have numerous benefits for work outcomes such as job satisfaction, performance (Odle-Dusseau et al., 2012), leader-follower relationship quality (Bagger & Li, 2014) as well as health outcomes such as sleep (Berkman et al., 2010), employee stress (e.g., Hammer et al., 2013), and burnout (e.g., Koch & Binnewies, 2015) (Crain &

Stevens, 2018). Overall, a family-supportive leader is one who "empathizes with the employee's desire to seek balance between work and nonwork responsibilities" (Thomas & Ganster, 1995, p.7). A leader's sleep is likely to impact their ability to engage in FSSB because such behaviors might be effortful due to the need for emotion, empathy, and proactivity to effectively engage in such behaviors. Research has indicated that sleep can impair emotional regulation (e.g., Palmer & Alfano, 2017), empathy (e.g., Guadagni et al., 2014; Guadagni et al., 2017), and proactivity (e.g., Schmitt et al., 2017). For example, if a leader obtains enough sleep, they might be more likely to demonstrate empathy and proactivity for addressing and resolving an employee's nonwork demand. Thus, understanding sleep's role as a precursor to FSSB will provide insight into promoting these advantageous behaviors in workplaces (See Figure 1).

Hypothesis 2: Leader sleep quantity at Time 1will have a positive relationship with leader and employee reports of FSSB at Time 3.

Sleep Leadership

Although FSSB refers to supervisor behaviors that enable employees to balance their work and nonwork demands, this construct does not specifically take into consideration the domain of sleep. According to Crain and colleagues (2018), past literature examining the domains of a working individual's life has often overlooked sleep as a major area, as sleep makes up a significant portion of a 24-hour period. In contrast to FSSB, sleep leadership refers to supportive behaviors that directly target the sleep domain of an employee's life (Gunia et al., 2015). Leaders that engage in sleep leadership behaviors help employees accomplish their sleep goals and demonstrate

concern for employee sleep health. Overall, sleep leadership could serve a supportive function to improve employee sleep (Gunia et al., 2015). Promoting sleep leadership in the workplace is essential, as such behaviors have been linked to improved employee sleep, supervisor sleep knowledge, and organizational climate as well as decreased depressive symptoms among employees (Adler et al., 2021; Gunia et al., 2015). A recent review on short sleep duration among working adults in the United States posits that leaders and organizations who are supportive of employee sleep may experience benefits such as increased employee workplace productivity, reduction in healthcare costs, and improved employee workplace safety and health (Khubchandani & Price, 2020). A leader's own sleep is likely to impact their ability to provide sleep leadership to their employees because if a leader's sleep is suffering, they may not know how to obtain healthy sleep within their own life and thus may be less likely to be able to provide that information to their employees. Additionally, similar to FSSB, showing concern for employee sleep is likely effortful, especially under conditions of when a leader's own sleep is reduced. Indeed, sleep research has indicated that sleep restriction impacts effort allocation (Massar et al., 2019), suggesting that leaders may be less likely to allocate effort towards performance goals such as aiding and caring for employee sleep. For example, leaders who do not get enough sleep may be less likely to care about their employees sleep or be able to help their employees with sleep because the leader's own sleep is suffering. In contrast to FSSB, however, leader sleep may be associated subsequent sleep leadership behaviors because if a leader does not show care and concern for their own sleep then it is especially unlikely for leaders to demonstrate the same for

their employees' sleep. Consequently, understanding how leader sleep may impact their ability to aid and care about employee sleep is essential (See Figure 1).

Hypothesis 3: Leader sleep quantity at Time 1will have a positive relationship with leader and employee reports of sleep leadership at Time 3.

Emotional Exhaustion as a Mediator

The second aim of this study is to understand *why* sleep quantity and leader behavior might be related. One of the basic tenets of the WNS theoretical model is that sleep influences behaviors at work via energy resources such as energetic activation (Crain et al., 2018). Emotional exhaustion is a manifestation of low energetic *activation* (Quinn et al., 2012) and occurs when resources are lost or insufficient to meet demands (Hobfoll, 1989). Sleep is a fundamental physiological process that can assist with the replenishment of such resources (Barnes, 2012; Toker & Melamed, 2017). Accordingly, theory suggests that sleep quantity has a negative relationship with energetic activation (Crain et al., 2018), resulting in increased emotional exhaustion.

Furthermore, emotional exhaustion is a plausible explanation for why leader sleep may impact subsequent positive support behaviors. Energetic activation and emotional exhaustion have been linked to affective constructs such as emotions, moods, or dispositions (Crain et al., 2018; Quinn et al., 2012). Specifically, energetic activation and emotional exhaustion are associated with subsequent emotions, moods, or dispositions such that in a state of low energetic activation and high emotional exhaustion, one is more likely to experience difficulty managing emotions resulting in increased negative affect (Lam et al., 2010; Quinn et al., 2012; Wright & Cropanzano, 1998). Similarly,

individuals experiencing emotional exhaustion are likely to feel emotionally overextended (Maslach & Jackson, 1981). Organizational health scholars have suggested that an affective-based construct may serve as a mechanism between sleep and workplace outcomes (Barnes, 2012; Henderson & Horan, 2021; Mullins et al., 2014). Positive leader support behaviors (e.g., general supervisor support, FSSB, and sleep leadership) rely on the leader appraising that they have enough energy to display care and concern for the employee's work and nonwork life, which is inherently emotional and expected to be tied to one's emotional exhaustion (Quinn et al., 2012). Thus, the present model focuses on emotional exhaustion as a mediator as it will further our understanding of the underlying affective process that connects sleep to leader support behaviors.

Drawing from experimental sleep research, substantial evidence exists linking sleep to affective variables such as mood (i.e., affective states that are not linked to a specific stimulus and are low in intensity; Daus et al., 2020), emotion (i.e., affective reactions that have a clear cause, are short in duration, and have higher intensity; Frijda, 1993, Kelly & Barsade, 2001), and interpersonal functioning (i.e., empathy toward others and quality of relationships; Killgore et al., 2008). For example, when sleep duration of individuals is restricted in an experimental setting, findings have indicated participants experience significant mood disturbances, mental exhaustion, and emotional complaints (e.g., depression, anxiety, vigor) (e.g., Banks & Dinges, 2007; Dinges et al., 1997; Friedmann et al., 1977; Goel et al., 2009; Johnson & MacLeod, 1973; Short & Banks, 2014). Laboratory experiments have also suggested that sleep restriction can impact one's ability to appropriately interpret and respond to another's emotions (e.g., Amicucci et al.,

2021; Tempesta et al., 2020; Van der Helm et al., 2010), which is essential as leader success requires emotional and interpersonal skills for relationship building (Riggio & Reichard, 2008). Furthermore, experimental sleep restriction has been found to weaken the ability to suppress negative emotions as well as decrease one's willingness to facilitate effective social interaction through behavior (Kahn-Greene et al., 2006). Finally, Killgore and colleagues (2008) found that experimentally controlled sleep restriction resulted in reduced intrapersonal functioning (e.g., assertiveness, independence), interpersonal functioning (e.g., empathy, quality of relationships), stress management skills (e.g., reduced impulse control), and behavioral coping (e.g., action orientation). Non-experimental studies also corroborate results that sleep can impact emotional exhaustion. For example, lowered sleep duration is a risk factor for burnout, particularly the emotional exhaustion component, as well as decreased interpersonal effectiveness (Ekstedt et al., 2006, Jansson-Fröjmark & Lindblom, 2010; Litwiller et al., 2017; Nowack, 2017; Rosen et al., 2006; Söderström et al., 2012;). Sleep quantity, therefore, can impair interpersonal or emotional skills that are fundamental to a leader's ability to engage in positive support behaviors.

Prior work has also demonstrated that emotional exhaustion is related to leader behavior. For example, emotional exhaustion has been found to be an important risk factor that is likely to trigger abusive leader behavior (e.g., Fan et al., 2020; Lam et al., 2017). Sleep physiology research supports this connection such that sleep deprivation is associated with amplified negative emotional reactivity such as increased irritability and affective volatility (Horne, 1985; Dinges et al., 1997; Walker et al., 2009; Zohar et al.,

2005). Additionally, an empirical study conducted by Qian and colleagues (2020) found that emotional exhaustion acts as a linking variable between job insecurity and transformational leadership behavior. This line of research supports the theoretical proposition that emotional exhaustion is likely to influence downstream behaviors in the workplace (Crain et al., 2018). Most of the literature on emotional exhaustion and leadership focuses on how leader styles/behaviors can impact employee emotional exhaustion, yet little research has examined emotional exhaustion of the leader. This is critical as studies indicate that leaders' emotional exhaustion has important consequences for both employees and the organization, including employees' well-being and task performance (e.g., Lam et al., 2010).

Building from this theoretical and empirical foundation, the present study will examine the role of emotional exhaustion as a linking mechanism between sleep quantity and support outcomes. Specifically, I believe that emotional exhaustion is closely tied to leader support behaviors such as general supervisor support, FSSB, and sleep leadership given the affective connotation of the behaviors (See Figure 1). For example, leaders must empathize with employees' concerns and expend their own resources to support an employee's needs (e.g., Hammer et al., 2011), and thus, emotional exhaustion may be particularly impactful on a leader's ability to provide support to their employees.

Hypothesis 4a: Leader emotional exhaustion at Time 2 will mediate the positive relationship between leader sleep quantity at Time 1 and employee reports of general supervisor support at Time 3.

Hypothesis 4b-c: Leader emotional exhaustion at Time 2 will mediate the positive relationship between leader sleep quantity at Time 1 and leader and employee reports of FSSB at Time 3.

Hypothesis 4d-e: Leader emotional exhaustion at Time 2 will mediate the positive relationship between leader sleep quantity at Time 1 and leader and employee reports of sleep leadership at Time 3.

Interaction between Sleep Quantity and Sleep Quality

Building off hypotheses that sleep quantity and leader support behaviors are related via emotional exhaustion, this present study also aims to understand *how* this relationship might change if sleep quality is included in the model. Past literature has typically examined sleep quantity and quality as additive components of sleep (Barnes, 2012), such that the effects of each sleep dimension are examined individually and cannot be substituted. The WNS model, however, cites past research in which an interaction effect exists between sleep quantity and quality (Crain et al., 2018), suggesting that the relationship between the constructs could also be multiplicative. Specifically, Barber and colleagues (2010) found that sleep quantity and quality interact to buffer against psychological strain as an outcome, such the relationship between sleep quantity and psychological strain is weakened under conditions of high sleep quality. Additionally, although Barnes and colleagues (2015) hypothesized that sleep quantity and sleep quantity would have additive effects on ego depletion and subsequent leader behavior, results indicated that the relationship between sleep quantity and daily ego depletion was weakened under conditions of high sleep quality, lending empirical evidence to motivate

the hypothesized interaction. Due to the novelty of this relationship, researchers have called for further exploration of this effect on other health and wellbeing outcomes. The authors of the WNS framework suggest that future research should aim to break down and understand the specific resources and processes that are influenced by distinct constructs of sleep (Crain et al., 2018). Thus, this study attempts to extend the literature on the interaction between sleep quantity and quality by examining emotional exhaustion as a potential outcome. For example, if leaders get enough sleep *and* they feel rested and satisfied with their sleep, they will experience less emotional exhaustion than leaders who obtain insufficient sleep quantity and poor sleep quality. Overall, I expect that higher levels of sleep quantity are related to less emotional exhaustion and this relationship is enhanced under conditions of higher sleep quality (H5; See Figure 1).

> **Hypothesis 5:** Leader sleep quality at Time 1 will moderate the relationship between leader sleep quantity at Time 1 and leader emotional exhaustion at Time 2, such that the negative relationship between sleep quantity and emotional exhaustion will be enhanced under conditions of high (versus low) sleep quality.

Moderated Mediation Effects

Overall, empirical and theoretical evidence suggest that sleep can impact work-related attitudes, behaviors, and states (Crain et al., 2018) and thus, the current study hypothesizes that this relationship takes place through a moderated mediating framework such that the indirect effect of sleep quantity on three distinct positive leader support behaviors via emotional exhaustion is enhanced by sleep quality. Specifically, under conditions of high sleep quality and sufficient sleep duration, a leader's propensity for

experiencing downstream emotional exhaustion and a subsequent decrease in positive support behaviors at work is significantly reduced. For example, if a leader is consistently getting enough sleep and feels rested, they won't as feel emotionally overextended, allowing the leader to be more effective in providing support to employees at work. Thus, it is hypothesized that sleep quality moderates the indirect effect of sleep quantity on general supervisor support, FSSB, and sleep leadership via emotional exhaustion (H6; See Figure 1).

Hypothesis 6a-b: Leader sleep quality at Time 1 will moderate the indirect effect of leader sleep quantity at Time 2 on employee ratings of general supervisor support at Time 3 via leader emotional exhaustion at Time 2.

Hypothesis 7a-d: Leader sleep quality at Time 1 will moderate the indirect effect of leader sleep quantity at Time 1 on leader and employee ratings of FSSB at Time 3 via leader emotional exhaustion at Time 2.

Hypothesis 8a-d: Leader sleep quality at Time 1 will moderate the indirect effect of leader sleep quantity at Time 1 on leader and employee ratings of sleep leadership at Time 3 via leader emotional exhaustion at Time 2.

Method

Procedure and Participants

Data were collected as part of a larger sleep and health intervention study that ran from 2017 through 2020. Specifically, I examined a sample of leaders who were matched with their respective direct employees. Broadly, participants in this study consisted of full-time employees of the Army and Air National Guard located in one state in the

Pacific Northwest of the U.S. Participants were employed in a wide variety of positions but were primarily leaders and employees employed in human resources, finance/supply, logistics, and maintenance. Surveys were completed at three time points: baseline (Time 1), 4-months post-intervention (Time 2), and 9-months post-intervention (Time 3). Thus, I examined sleep duration and sleep quality at Time 1, emotional exhaustion at Time 2, and support behaviors (i.e., general supervisor support, FSSB, and sleep leadership) at Time 3. Because the intervention was not of substantive interest in this study, I controlled for the intervention indicator in all analyses, as I describe in greater detail below.

Please see Hammer et al. (2021) for detailed information on recruitment and study logistics. Regarding data collection for this thesis, the research team initially worked with the headquarters of the National Guard and were given organizational charts as well as breakdowns of units and the respective leaders, including leader contact information. For smaller units and the Air branch, a person-of-contact within the National Guard was identified and they connected the research team with the appropriate leader. From this information, leaders were emailed and debriefed about the study. Unit leaders were asked by the research team to respond to an online survey via REDCap (Research Electronic Data Capture) that was sent to the personal email addresses of leader participants. Leaders were also asked to send an email to the full-time employees who directly reported to them, with information and a link for opting into the study. Participants were eligible to sign-up if they worked at least 32 hours per week, and also then received an online survey via REDCap. All surveys were completed during non-work time.

Employee participants were asked to indicate who their direct leader was in their online survey (i.e., the leader that they report to if they needed to take time off work). Based off this information and the organizational chart given to the research team at the beginning of the study, participating leaders were matched with their respective employees once all data were collected. The research team worked from the list with individual unit leaders to determine a final list of leaders per unit depending on who in the unit participated in the study and were linked to employees. Thus, the final data set includes employees linked to their respective leader in which leaders may have one or multiple direct employees. Specifically, each leader in this dataset had between one to 13 employees matched to them as a result of this process.

In all, participants were asked to complete three 45-minute online surveys over the course of a year, and surveys were identical for all participants (leaders and employees). As an incentive, participants were offered a gift card for $25 for completing each individual survey, resulting in a potential total reward of $75 for completing all survey waves. Research staff then visited Army and Air bases to give an in-person briefing of the study and recruit any further employees who had not yet signed up for the study. Conducting both online and in-person recruitment helped to increase participation and prevent attrition from the study. All study participants signed informed consent forms before entering the study and the study protocol was approved by Institutional Review Boards of the principal investigators' institutions.

Data from multiple measurement occasions and sources (i.e., leaders and employees) were merged to create the desired dataset for this study. Based on survey

responses, leaders who had not been matched with at least one participating employee were removed from the dataset. Similarly, employees who were not matched with a participating leader were also removed from the dataset. The final sample size for matched leaders and employees was $N = 178$ and $N = 393$, respectively.

Most leader participants were white (84.3%), male (80.9%), married (82.6%), and were on average 40.8 years old (SD = 7.30). Leaders had approximately two children on average ($SD = 1.4$) and had completed a college degree (41.6%). Leaders had an average tenure of 5.39 years ($SD = 5.80$), worked approximately 44.83 hours per week on average ($SD = 5.31$), worked a regular daytime shift (89.3%), and had approximately six direct reports on average ($SD = 6.18$). Most employee participants were white (81.9%), male (74%), married (65.6%), and were on average 35.8 years old ($SD = 8.86$). Employees had approximately two children on average ($SD = 1.4$), and the majority of employees only completed some college/technical school with no degree (43.5%). Employees had an average tenure of 4.36 years ($SD = 5.56$), worked an average of 42.37 hours per week ($SD = 5.0$), and worked a regular daytime shift (81.2%).

Measures

Leader sleep quantity

Leaders were asked to assess the duration of their sleep during the last month at Time 1. Leaders were told that their answers should indicate the most accurate reply for the majority of days and nights in the past month to reflect their average sleep duration. Sleep duration was measured using two items from the Pittsburg Sleep Quality Index (PSQI; Buysse et al., 1989). The items included, “During the past month, when have you

usually gone to bed at night?" and "During the past month, when have you usually gotten up in the morning?" (see Appendix). Leaders answered each item by indicating the hour (01-12), minute (00-59), and which 12-hour period of the day (AM/PM) they went to sleep and woke up. These items were used to compute leader sleep duration (i.e., a difference score between when the leader reported they went to bed and when they woke up).

Leader sleep quality

Leaders were asked the extent to which they experienced poor sleep quality in the past week at Time 1. The sleep quality construct was measured using eight total items from the PROMIS Sleep Disturbance scale (Cella et al., 2010; PROMIS, 2016; Yu et al., 2012), which were separated into two measures based on confirmatory factor analysis results. Four items reflect the sleep dissatisfaction dimension. An example item is, "I was satisfied with my sleep". These items were rated on a 5-point scale (1 = *not at all,* 5 = *very much*) (Cronbach's α = .87) with the exception of one item that was rated on a 5-point scale with differing anchors (1= *very poor*, 5 = *very good*). The next four items represent the insomnia symptoms dimension. An example item is, "I had trouble staying asleep". Items were rated on a 5-point scale (1 = *never*, 5 = *always*) (Cronbach's α = .82) (See Appendix). As is recommended practice with these measures, scale scores for both dimensions of sleep quality were calculated following the HealthMeasures (2021) scoring system and a t-score transformation metric. This t-score transformation is necessary to have an understandable, comparable metric to better view distributions and percentiles from this sample across what we know from prior research to be the norm (i.e., average)

of sleep quality in the U.S. Additionally, this is considered the most accurate option because the scores are IRT-derived (using response pattern scoring). This option also handles missing data and is the recommended option for using subsets of items. Overall, higher scores reflect greater dissatisfaction with sleep for one dimension, and more insomnia symptoms for the other dimension.

Leader emotional exhaustion

Leaders were asked to indicate the frequency with which they experienced feelings of emotional exhaustion in the past month at Time 2. The scale consisted of three items on a 7-point scale (1= *never or almost never*, 7 = *always or almost always*) (Cronbach's α = .78). An example item is, "I feel I am not capable of investing emotionally in coworkers" (Shirom & Melamed, 2006) (See Appendix). Scale scores were created for leader emotional exhaustion using mean imputation if at least 75% of the items were answered per scale. Otherwise, all scales and items were subject to listwise deletion if 75% of valid item responses were not present.

Employee-rated general supervisor support

Employees rated the extent to which they agreed with each statement with three items on a 5-point scale at Time 3 (1 = *strongly disagree*, 5 = *strongly agree*) (Cronbach's α = .78). An example item is, "My supervisor can be relied upon when things get tough on my job" (Yoon & Lim, 1999) (See Appendix). Scale scores were created for employee rated general supervisor support using mean imputation if at least 75% of the items were answered per scale.

Leader- and employee-rated family-supportive supervisor behaviors

Leaders rated the extent to which they agree that they exhibited FSSB at Time 3. The short form 4-item FSSB measure (Hammer et al., 2013) was utilized for the present study (Cronbach's α = .89). Leaders were asked to respond to four items on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). An example item is, "I make my subordinates feel comfortable talking to me about their conflicts between work and non-work" (See Appendix).

Employees who were linked to each leader were also asked to rate the extent to which they agreed that their direct leader exhibited FSSB at Time 3 using the same scale. Employees responded to four items, also rated on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*) (Cronbach's α = .95). An example item is, "Your supervisor makes you feel comfortable talking to him/her about your conflicts between work and non-work" (See Appendix). Scale scores were created for leader and employee ratings of FSSB using mean imputation if at least 75% of the items were answered per scale.

Leader- and employee-rated sleep leadership

Leaders rated the extent to which they agree that they exhibited sleep leadership with eight items on a 5-point scale (Gunia et al., 2015) at Time 3 (1 = *strongly disagree*, 5 = *strongly agree*) (Cronbach's α = .88). An example item is, "I encourage my subordinates to get adequate sleep" (See Appendix).

Employees that are linked to each leader were also asked to rate the extent to which they agreed that their direct leader exhibited sleep leadership behaviors at Time 3. Employees responded to eight items on a 5-point scale (1 = *never*, 5 = *always*)

(Cronbach's α = .94). An example item is, "My supervisor encourages subordinates to get adequate sleep (Gunia et al., 2015) (See Appendix). Scale scores were created for leader and employee ratings of sleep leadership using mean imputation if at least 75% of the items were answered per scale.

Control variables

A set of control variables for inclusion were selected according to theory and past research, following Bernerth and Aguinis' (2016) discussion of the use of statistical control variables (See Appendix). Specifically, this study moved away from the purification principle (Spector & Brannick, 2011) as recent research suggests that control variables may be causing harm to analyses by changing the meaning of the relationship, reducing degrees of freedom, lowering power, and diminishing explained variance (Bernerth et al., 2018). Moreover, some researchers even suggest that overinclusion of control variables may produce erroneous inferences and irreplicable results, creating barriers to scientific progress (Becker et al., 2016). Thus, selected control variables should be both empirically and theoretically related to variables of interest to control for alternative explanations and spuriousness of relationships in the model. In line with recommendations by past researchers, the following section outlines conceptually relevant control variables that are included in analyses (Aguinis et al., 2019; Aguinis & Vandenberg, 2014; Bernerth & Aguinis, 2016; Bernerth et al., 2018). Additionally, all analyses were performed both with and without control variables and standard descriptive statistics were reported for all control variables, including correlations and significance levels (See Table 1) (Aguinis & Vandenberg, 2014; Bernerth & Aguinis, 2016; Bernerth

et al., 2018). There were no substantive differences in results, so all results are reported with the inclusion of controls, however I still describe the theoretical rationale for inclusion of control variables below.

Additionally, due to this study's predominant focus on workplace leaders, I followed recent recommendations from leadership researchers regarding the inclusion of demographic control variables. A systematic review conducted by Bernerth and colleagues (2018) indicated that there is an unconvincing effect size between leadership-relevant constructs and commonly used control variables such as age, gender, tenure, or education. Specifically, Bernerth and colleagues (2018) suggest the inclusion of such demographic controls is not grounded in theory and is solely based on outdated misconceptions surrounding control variables, resulting in significant detriments to analyses. Thus, this study did not include proxy demographic control variables such as leader age, gender, tenure, or education (Bernerth et al., 2018).

Work-related controls. Empirical research has demonstrated that certain characteristics of jobs can impact sleep. For example, shift work (e.g., Åkerstedt, 2003; Van Dogen et al., 2006) has been shown to lead to poor sleep. This relationship may be explained by the fact that the circadian rhythm (i.e., our biological clock) produces periods of time that are more conducive to sleep. Furthermore, in the present study, it is possible that leaders or employees who work shifts that deviate from the typical daytime shift may have less interaction with each other, thereby creating spuriousness within results as hypotheses depend on interaction between leaders and employees. Thus, as

shift work may impact both leader sleep as well as leader and employee ratings of positive support behaviors, work schedule was included as a control variable in analyses.

Although the majority of the sample is employed in jobs such as human resources or finance/logistics, there is a small portion of the sample that can be characterized as high risk. High-risk occupations are jobs that present the possibility of substantial and unpredictable danger (Gunia et al., 2015). Such occupations might include law enforcement (Russell, 2014), construction, manufacturing, mining, agriculture (Earnest et al., 2018), and military service (Elliman et al., 2020; Gunia et al., 2015). Those employed in high-risk positions have been shown to be particularly susceptible to sleep deficiencies due to increased strain (Akerstedt & Wright, 2009; Gunia et al., 2015; Linton et al., 2015; Seelig et al., 2016; Seelig et al., 2010). Thus, different jobs may be more or less affected by sleep. Furthermore, it is possible that different support behaviors may be more or less important for different jobs. For example, in the small high-risk portion of the sample, sleep leadership support behaviors may be more important for leaders to demonstrate than leaders in the human resources department. Participants were sampled from both Army and Air National Guard which have distinct types of work that could affect sleep and support behaviors. Specifically, Whealin and colleagues (2015) suggest that the Army branch of the National Guard experience poorer health outcomes compared to the Air branch, such as higher levels of post-traumatic stress syndrome and more serious physical and mental health detriments. As such, due to the high variability among jobs in this sample, branch of service (i.e., Army, Air) was included as a control variable.

Finally, the larger study was a randomized-controlled trial intervention. However, for the present study, the intervention is not a variable of interest, and thus, the intervention indicator (0 = usual practice, 1 = intervention) was included as a control variable.

Family-related controls. Empirical studies suggest that individuals who have children at home report shorter sleep duration in comparison to those who are childfree (e.g., Burgard & Ailshire, 2012; Hagen et al., 2013; Khubchandani & Price, 2020; Tienoven et al., 2014). This relationship may be explained by the fact that time is finite, and those with children must dedicate the limited time outside of work to caring for children, which may result in impaired sleep. Furthermore, it is also possible that leaders who have children may be more empathetic to employee nonwork demands and thus, may demonstrate more nonwork support (e.g., FSSB, sleep leadership). Given that number of children at home may influence both leader sleep and subsequent support behaviors, number of children was included as a control variable. Similarly, individuals that have caregiving responsibilities for elders can report deficient sleep (Burch, 2019; Dugan et al., 2020), as they also report less available time for sleep (American Psychological Association, 2012; Caruso et al., 2006). Additionally, individuals who acquire eldercare demands report poor sleep quality as they have frequent sleep disturbances and greater difficulty falling asleep at night (Hoyt et al., 2021). The same theoretical argument may be made for childcare and eldercare responsibilities such that leaders who have nonwork demands in the form of eldercare responsibilities may be more empathetic toward employee nonwork demands and thus, demonstrate more

positive support behaviors in the workplace. As such, eldercare responsibilities were included as a control variable.

Results

Analytic Strategy

Data Cleaning and Preliminary Analyses

Prior to conducting the main analyses, data were examined for errors in data entry, missing values, and outliers. Scale scores were created for all key variables using mean imputation as described in the measures section and were subject to listwise deletion if this threshold was not met. Following this, the proposed key variables (i.e., predictors, moderators, mediators, outcomes, and controls) were examined in SPSS to determine if multilevel multiple regression assumptions (i.e., normality, linearity, independence of errors, absence of multicollinearity, heteroscedasticity) were met.

Specifically, the data were initially examined for univariate outliers by viewing, frequency distributions, box and whisker plots, and histograms. For the predictors and mediators, there were two outliers on the sleep duration and sleep dissatisfaction variables, and five outliers on the insomnia symptoms variable. For the outcome variables, there were three outliers on general supervisor support, four outliers on leader-ratings of FSSB, five outliers on employee-ratings of FSSB, and four outliers on employee-ratings of sleep leadership. After thorough examination of the outlier values, however, there was no theoretical reasoning for removal of these outliers and thus, identified univariate outliers were retained. Multivariate outliers were checked using residuals analysis, Cook's D, Mahalanobis' distance (24.32 based on degrees of

freedom), centered leverage values, and scatterplots. Evidence suggested the absence of multivariate outliers.

Data were then assessed for both normality and linearity. Emotional exhaustion and employee-ratings of sleep leadership were slightly positively skewed, although no transformations improved kurtosis and skewness estimates. For this reason, the original variables were retained. Sleep duration, insomnia symptoms, sleep dissatisfaction, and leader-ratings of sleep leadership were normally distributed. General supervisor support and employee-ratings of FSSB were negatively skewed. Negatively skewed variables were transformed using square root transformation, which improved both skewness and kurtosis, however, modeling with and without transformed variables did not result in substantially different results. Thus, the original untransformed values were used for analyses and are reported. All other variables met normality and linearity assumptions. Both histograms and scatterplots (i.e., of relationships as well as residuals) indicated that variables met heteroscedasticity assumptions and demonstrated independence of errors. Finally, psychometric tests were conducted to obtain the validity and reliability of measures by conducting CFAs and computing Cronbach's alpha for each measure, respectively.

Multilevel Modeling. Due to the nested structure of the data in which participating employees worked within work groups under the supervision of leaders, intraclass correlation coefficients (ICCs) were computed using the organizational group variable to determine the degree of dependency within work groups. Computing ICCs indicates whether multilevel modeling should be used in subsequent analyses. ICCs were

computed for emotional exhaustion (ICC = .09), leader-ratings of FSSB (ICC = .27), and leader-ratings of sleep leadership (ICC = .16), suggesting there is substantial dependency in the outcomes depending on work group. ICCs were not able to be computed for general supervisor support, employee-ratings of FSSB, or sleep leadership due to convergence issues, which is likely due to a lack of dependency within the work groups. However, multilevel modeling is the more conservative approach toward nested data, and given the relatively high ICCs among key outcome leader variables, multilevel modeling was attempted.

Descriptive Statistics. Table 1 shows descriptive statistics and bivariate correlations among all study variables, including control variables. On average, leaders spent roughly 7.36 hours per day sleeping over the previous month at Time 1 (*SD* = 0.94) and experienced a relatively low amount of emotional exhaustion at Time 2 on average (*M* = 2.07, *SD* = 1.00). On average, employees strongly agreed that their leaders provided general supervisor support (*M* = 4.23, *SD* = 0.84) at Time 3. Additionally, leaders and employees thought the leader seldom or sometimes provided sleep leadership at Time 3 (employee *M* = 2.51, *SD* = 1.0; leader, *M* = 2.61, *SD* = 0.78), whereas leaders and employees agreed the leaders provided FSSB at Time 3 (employee *M* = 4.11 *SD* = 0.09; leader *M* = 4.10, *SD* = 0.49).

Bivariate correlations were also inspected to determine the general nature of relationships between variables. There was not a significant correlation between leader sleep duration at Time 1 and leader emotional exhaustion at Time 2, or leader sleep dissatisfaction at Time 1 and leader emotional exhaustion at Time 2. Leader insomnia

symptoms at Time 1 were significantly and positively associated with leader emotional exhaustion at Time 2 ($r = 0.16$, $p < .01$). Interestingly, leader insomnia symptoms at Time 1 were significantly and negatively associated with leader-ratings of FSSB ($r = -0.12$, $p < .05$) and sleep leadership ($r = -0.14$, $p < .01$) at Time 3, but none of the employee-rated support outcomes at Time 3. Additionally, leader emotional exhaustion at Time 2 was significantly and negatively correlated with leader-ratings of FSSB at Time 3 ($r = -0.32$, $p < .01$), but not with leader-ratings of sleep leadership at Time 3. Leader emotional exhaustion at Time 2, however, was significantly and negatively correlated with employee-ratings of general supervisor support ($r = -0.16$, $p < .05$), FSSB ($r = -0.13$, $p < .05$), and sleep leadership ($r = -0.14$, $p < .05$) at Time 3. Interestingly, leader and employee ratings of FSSB at Time 3 were not significantly correlated. Additionally, leader and employee ratings of sleep leadership at Time 3 were also not significantly correlated. Unsurprisingly, all employee ratings of general supervisor support, FSSB, and sleep leadership at Time 3 were strongly correlated with each other ($p < .01$).

Hypothesis Testing

For the main analyses, I examined a series of multilevel moderated-mediation models exploring the association between Time 1 leader sleep duration on Time 3 leader behavior outcomes (i.e., leader-reports of general supervisor support, leader and employee-reports of FSSB, and leader and employee-reports of sleep leadership) as mediated by Time 2 leader emotional exhaustion, with Time 1 leader sleep quality (i.e., sleep dissatisfaction, insomnia symptoms) also being evaluated as a moderator of the relationship between leader sleep duration and emotional exhaustion. Lastly, I evaluated

whether the mediation of leader sleep duration on leader outcomes through leader emotional exhaustion was moderated by sleep quality. Control variables included in the models were branch of service (i.e., Army vs. Air), condition (i.e., usual practice vs. intervention), number of children, eldercare, and work schedule (i.e., daytime vs. other). Analyses were conducted using Mplus Version 8 and multilevel fully-saturated path analyses were specified (Muthen & Muthen, 2018). Due to the complexity of the overall model with all variables included and convergence issues that resulted, I ran a series of five moderated mediation models in which the predictor (i.e., sleep duration), both moderators (i.e., sleep dissatisfaction and insomnia symptoms), the mediator (i.e., emotional exhaustion), only one outcome (i.e., general supervisor support, leader-ratings of FSSB, employee-ratings of FSSB, leader-ratings of sleep leadership, employee-ratings of sleep leadership), and all control variables were included.

Direct Effects

Hypothesis 1 proposed that Time 1 leader sleep duration would have a positive relationship with employee reports of general supervisor support at Time 3. Controlling for all other variables in the model, there was no significant association between leader sleep duration at Time 1 and employee-rated general supervisor support at Time 3 (b = 0.62, SE = 0.05 p = 0.22, 95% CI [-.048, .146]). *Hypothesis 2* proposed that Time 1 leader sleep duration would have a positive relationship with leader and employee reports of FSSB at Time 3. There were no significant associations found between leader sleep duration at Time 1 and leader reports of FSSB at Time 3 *(*b = -0.01, SE = 0.08, p = 0.95, 95% CI [-.13, .20]) or employee-reports of FSSB at Time 3 (b = 0.06, SE = 0.07, p =

0.41, 95% CI [-.09, .19]), controlling for all other variables in the model. Finally, *Hypothesis 3* proposed that Time 1 leader sleep duration would have a positive relationship with leader and employee reports of sleep leadership at Time 3. Controlling for all other variables in the model, there were no significant association between leader sleep duration at Time 1 and leader reports of sleep leadership at Time 3 (b = -0.05, SE = 0.11, p = 0.64, 95% CI [-.27, .17]) or employee reports of sleep leadership at Time 3 (b = -0.07, SE = 0.81, p = 0.41, 95% CI [-.02, .09]). Therefore, *Hypotheses 1-3* were not supported. See Table 2 for a summary of the direct effects.

Mediation

Hypotheses 4a-e propose that leader emotional exhaustion at Time 2 would mediate the positive relationship between leader sleep duration at Time 1 and employee reports of general supervisor support (*4a*) at Time 3, and leader (*4b*) and employee reports (*4c)* of FSSB and sleep leadership (*4d-e*) at Time 3. To evaluate the significance of indirect effects, bootstrapping with 5,000 bootstrapped samples was used. This approach is advantageous due to its ability to create standard errors that are resistant to outlier values and distribution issues (Chernick et al., 2014). Significance was determined by 95% confidence intervals that did not include zero. Results reported are representative of when all other variables in the model are controlled for.

Results indicated a non-significant indirect effect of leader sleep duration at Time 1 on employee-rated general supervisor support at Time 3 via leader emotional exhaustion at Time 2 (indirect effect = 0.01, 95% CI [-.02, .06]). Additionally, there was a non-significant indirect effect of leader sleep duration at Time 1 on leader-rated FSSB

at Time 3 through leader emotional exhaustion at Time 2 (indirect effect = 0.00, 95% CI [-.01, .05]). There was a non-significant indirect effect of leader sleep duration at Time 1 on employee-rated FSSB at Time 3 via leader emotional exhaustion at Time 2 (indirect effect = 0.01, 95% CI [-.01, .05]). Also, there was a non-significant indirect effect between leader sleep duration at Time 1 on leader-rated sleep leadership at Time 3 via leader emotional exhaustion at Time 2 (indirect effect = 0.00, 95% CI [-.01, .03]). Finally, there was a non-significant indirect effect of leader sleep duration at Time 1 on employee-rated sleep leadership at Time 3 via leader emotional exhaustion at Time 2 (indirect effect = 0.02, 95% CI [-.02, .06]). Thus, *Hypotheses 4a-e* were not supported. See Table 3 for summary of indirect effects.

Moderation

Given that I proposed a potential interaction between leader sleep duration and leader sleep quality (i.e., sleep dissatisfaction and insomnia symptoms), interaction terms were created, with grand mean centered values of the predictor and moderator to avoid issues of multicollinearity (Tabachnik & Fidell, 2007). Depending on the nature of the outcome (i.e., employee or leader ratings), the corresponding control variables were used (i.e., employee work schedule vs. leader schedule)[1]. *Hypotheses 5a-b* proposed that leader sleep quality at Time 1 (i.e., sleep dissatisfaction [*5a*] and insomnia symptoms [5*b*]) would moderate the relationship between leader sleep duration at Time 1 and leader

[1]The moderation results reported in this section are from the leader models in which the outcome variables and control variables are leader-based (e.g., leader-ratings of FSSB, leader work schedule). The moderation values do not change significantly when examining the employee models.

emotional exhaustion at Time 2, such that the negative relationship between leader sleep duration and leader emotional exhaustion would be enhanced under conditions of better (versus poorer) leader sleep quality. Controlling for all other variables in the model, results indicated that leader insomnia symptoms at Time 1 did not significantly moderate the relationship between leader sleep duration at Time 1 and leader emotional exhaustion at Time 2 (b = -0.00, SE = 0.02, p = 0.92, 95% CI [-.04, .04]). Thus, *Hypothesis 5a* was not supported. Additionally, results indicated that leader sleep dissatisfaction at Time 1 did not significantly moderate the relationship between leader sleep duration at Time 1 and leader emotional exhaustion at Time 2 (b = 0.02, SE = 0.02, p = 0.26, 95% CI [-.01, .05]) controlling for all other variables in the model. Thus, *Hypothesis 5b* was not supported. See Table 3 for summary of moderation effects.

Moderated Mediation

Hypotheses 6a-b proposed that leader sleep quality at Time 1 (i.e., sleep dissatisfaction [*6a*] and insomnia symptoms [*6b*]) would moderate the indirect effect of leader sleep duration at Time 1 on employee-rated general supervisor support at Time 3, via leader emotional exhaustion at Time 2. Following recommendations from Preacher and colleagues (2007), the moderated mediational (conditional indirect effect) models can be assessed by centering the moderator at conditional values of interest, estimating model parameters, and interpreting the direct effects as simple slopes. Thus, the predictor variable (i.e., leader sleep duration) and the moderators (i.e., leader sleep dissatisfaction and leader insomnia symptoms) were centered to compute the interaction terms. Controlling for all other variables in the model, results indicated that leader sleep

dissatisfaction at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 on employee-rated general supervisor support at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = -0.00, 95% CI [-.01, .00]). Thus, *Hypothesis 6a* was not supported. Results also indicated that leader insomnia symptoms at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 on employee-rated general supervisor support at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = 0.00, 95% CI [-.00, .01]), controlling for all other variables in the model. Thus, *Hypothesis 6b* was not supported.

Hypotheses 7a-b proposed that leader sleep dissatisfaction at Time 1 would moderate the indirect effect of leader sleep duration at Time 1 on leader (*7a*) and employee ratings (*7b)* of FSSB at Time 3, via leader emotional exhaustion at Time 2. Controlling for all other variables in the model, results indicated that leader sleep dissatisfaction at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 on leader ratings of FSSB at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = 0.00, 95% CI [-.01, .00]). Additionally, results indicated that leader sleep dissatisfaction at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and employee ratings of FSSB at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = -0.00, 95% CI [-.01, .00]), controlling for all other variables in the model. Thus, *Hypotheses 7a-b* were not supported.

Hypotheses 7c-d proposed that leader insomnia symptoms at Time 1 would moderate the indirect effect of leader sleep duration at Time 1 on leader (*7c*) and

employee ratings (*7d*) of FSSB at Time 3, via leader emotional exhaustion at Time 2. Controlling for all other variables in the model, results indicated that leader insomnia symptoms at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and leader ratings of FSSB at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = 0.00, 95% CI [-.00, .01]). Additionally, results indicated that leader insomnia symptoms at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and employee ratings of FSSB at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = 0.00, 95% CI [-.00, .01]), controlling for all other variables in the model. Thus, *Hypotheses 7c-d* were not supported.

Hypotheses 8a-b proposed that leader sleep dissatisfaction at Time 1 would moderate the indirect effect of leader sleep duration at Time 1 on leader (*8a*) and employee ratings (*8b*) of sleep leadership at Time 3, via leader emotional exhaustion at Time 2. Controlling for all other variables in the model, results indicated that leader sleep dissatisfaction at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and leader ratings of sleep leadership at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = 0.00, 95% CI [-.01, .02]). Additionally, results indicated that leader sleep dissatisfaction at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and employee ratings of sleep leadership at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = -0.00, 95% CI [-.01, .00]), controlling for all other variables in the model. Thus, *Hypotheses 8a-b* were not supported.

Hypotheses *8c-d* proposed that leader insomnia symptoms at Time 1 would moderate the indirect effect of leader sleep duration at Time 1 on leader (*8c*) and employee ratings (*8d*) of sleep leadership at Time 3, via leader emotional exhaustion at T2. Controlling for all other variables in the model, results indicated that leader insomnia symptoms at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and leader ratings of sleep leadership at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = 0.00, 95% CI [-.00, .01]). Results also indicated that leader insomnia symptoms at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and employee ratings of sleep leadership at Time 3 via leader emotional exhaustion at Time 2 (conditional indirect effect = 0.00, 95% CI [-.01, .01]), controlling for all other variables in the model. Thus, *Hypotheses 8c-d* were not supported. See Table 3 for a summary of moderated mediation effects reported below.

Post-Hoc Life Satisfaction Analyses

Based on recommendations from my thesis committee, I also evaluated life satisfaction as mediator within fully-saturated path models, with the same predictor, moderators, outcomes, and control variables. The theoretical choice for analyzing life satisfaction is twofold. First, emotional exhaustion is not inherently a resource, but is more representative of a lack of resources or resource loss. Life satisfaction, on the other hand, can act as another resource-based mediator, such that it represents the presence of resources. Secondly, inclusion of life satisfaction in this model contributes to the existing literature and the WNS theoretical model (Crain et al., 2018). Including life satisfaction

as a mediator would have potentially bolstered the current study's focus on positive framing as discussed in the introduction section, thereby improving upon the unique contribution of this paper in comparison to past literature on sleep and leader behavior that has been primarily negative in nature. Life satisfaction also represents a resource-based mechanism that was not explicitly proposed in the WNS framework. Thus, I examined life satisfaction as a mediator and the representation of a presence of resources among leaders in the linkage between leader sleep and downstream support behaviors.

I first conducted regression assumption checks for life satisfaction. Overall, life satisfaction was normally distributed. Univariate outliers were first assessed and eleven were identified, however, there was no theoretical reason to drop the cases from the study. Moreover, multivariate outliers were assessed, and none were identified. Thus, outliers were retained for analyses. ICC analyses suggest that there is substantial dependency in life satisfaction depending on work group (0.18). Thus, multilevel modeling was used for analyses. Overall, leaders were on average satisfied with their life (M = 3.80, SD = 0.61). Of note, leader sleep dissatisfaction at Time 1 was significantly and negatively correlated with leader life satisfaction at Time 2 (r = -0.18, p < .01). Leader life satisfaction at Time 2 was significantly and negatively correlated with leader emotional exhaustion at Time 2 (r = -0.20, p < .01). Finally, leader life satisfaction at Time 2 was significantly and positively associated with leader ratings of FSSB at Time 3 (r = 0.20, p < .01). See Table 1 for reference (i.e., descriptives and correlations).

Overall, there were no significant direct effects, indirect effects, moderation effects or conditional indirect effects when evaluating life satisfaction as a mediator, but I

do report these results below. See Tables 5 and 6 for a summary of these results. First, when controlling for all other variables in the model, results indicated a non-significant relationship between leader sleep duration at Time 1 and employee rated general supervisor support at Time 3, through leader life satisfaction at Time 2 (indirect effect = -0.02, 95% CI [-.06, .00]). Additionally, results indicated a non-significant relationship between leader sleep duration at Time 1 and leader rated FSSB at Time 3 via leader life satisfaction at Time 2 (indirect effect = 0.01, 95% CI [-.01, .04]). Results demonstrated a non-significant relationship between leader sleep duration at Time 1 and employee-rated FSSB at Time 3 via leader life satisfaction at Time 2 (indirect effect = -0.02, 95% CI [-.06, .00]). Results indicated a non-significant relationship between leader sleep duration at Time 1 and leader-rated FSSB at Time 3 via leader life satisfaction at Time 2 (indirect effect = 0.01, 95% CI [-.01, .04]). Also, results revealed a non-significant relationship between leader sleep duration at Time 1 and employee-rated sleep leadership at Time 3 via leader life satisfaction at Time 2 (indirect effect = -0.02, 95% CI [-.07, .01]). Finally, a non-significant relationship was found between leader sleep duration at Time 1 and leader-rated sleep leadership at Time 3 via leader life satisfaction at Time 2 (indirect effect = 0.00, 95% CI [-.04, .04]).

In terms of moderation analyses, results indicated that leader sleep dissatisfaction at Time 1 did not significantly moderate the relationship between leader sleep duration at Time 1 and leader life satisfaction at Time 2 (b = 0.01, SE = 0.01, p = 0.32, 95% CI [-.01, .04]). Similarly, results indicated that leader insomnia symptoms at Time 1 did not

significantly moderate the relationship between leader sleep duration at Time 1 and leader life satisfaction at Time 2 (*b* = -0.01, *SE* = 0.01, *p* = 0.47, 95% CI [-.03, .01]).

Finally, for the larger moderated mediation model, results indicated that leader sleep dissatisfaction at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 via leader life satisfaction at Time 2 (conditional indirect effect = -0.00, 95% CI [-.01, .00]). Results also indicated that leader insomnia symptoms at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and employee ratings of general supervisor support at Time 3 via leader life satisfaction at Time 2 (conditional indirect effect = 0.00, 95% CI [.00, .01]). For FSSB, results indicated that leader sleep dissatisfaction at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and leader-ratings of FSSB at Time 3 via leader life satisfaction at Time 2 (conditional indirect effect = 0.00, 95% CI [-.00, .02]) or employee ratings of FSSB at Time 3 via leader life satisfaction at Time 2 (conditional indirect effect = -0.00, 95% CI [-.01, .00]). Results also indicated that leader insomnia symptoms at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and leader ratings of FSSB at Time 3 via leader life satisfaction at Time 2 (conditional indirect effect = -0.00, 95% CI [-.01, .00]) or employee ratings of FSSB at Time 3 via leader life satisfaction at Time 2 (conditional indirect effect = 0.00, 95% CI [.00, .01]). Finally, for sleep leadership, results indicated that leader sleep dissatisfaction at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and leader ratings of sleep leadership at Time 3 via leader life satisfaction at Time 2 (indirect effect = 0.00, 95% CI [-.00, .01]) or employee ratings of

sleep leadership at Time 3 via leader life satisfaction at Time 2 (conditional indirect effect = 0.00, 95% CI [-.01, .01]). Results also indicated that leader insomnia symptoms at Time 1 did not significantly moderate the indirect effect of leader sleep duration at Time 1 and leader ratings of sleep leadership at Time 3 via leader life satisfaction at Time 2 (conditional indirect effect = 0.00, 95% CI [-.01, .00]) or employee ratings of sleep leadership at Time 3 via leader life satisfaction at Time 2 (conditional indirect effect = 0.00, 95% CI [-.00, .01].

Discussion

In this study, I explored the role of sleep quantity and quality on downstream leader support behaviors, specifically general supervisor support, FSSB, and sleep leadership. In addition, I hypothesized that emotional exhaustion serves as a linking mechanism in these relationships. These hypotheses were in line with the WNS theoretical framework (Crain et al., 2018), which posits that sleep influences downstream work behaviors through its capacity to generate energy resources. Results from multilevel path analyses revealed that no hypotheses were supported. In the sections that follow, I outline alternative theoretical explanations for why the lack of findings may have occurred.

Insights Based on Leader Support

Although there were no significant effects in this study and no support for hypotheses, it is first important to highlight interesting descriptive findings as they provide unique points for future investigation. Specifically, average employee (M = 2.51, SD = 0.48) and leader (M = 2.70, SD = 0.78) ratings of sleep leadership were much lower

compared to the means of the other two types of support, namely leader and employee ratings of FSSB (M = 4.11, SD = 0.90; M = 4.10, SD = 0.49, respectively) and employee ratings of general supervisor support (M = 4.23, SD = 0.80). Sleep leadership is a newer construct being applied within organizational research (i.e., Adler et al., 2021; Gunia et al., 2015; Gunia et al., 2021; Sianoja et al., 2020) and for this reason, not much research has been conducted on leader and employee perceptions of sleep leadership. As such, providing some discussion of sleep leadership within this unique sample is important.

These lower values of sleep leadership may indicate a few different things. Leaders themselves may feel uncomfortable crossing the sleep-related nonwork boundary with their employees and therefore may not be demonstrating sleep leadership. Sleep leadership may also be harder to engage in as a leader, compared to general supervisor support and FSSB, because leaders and employees may also have to agree on what is appropriate and comfortable to discuss for effective sleep leadership to be established by the leader and perceived by the employee. This may be especially true in a military setting, such that FSSB may be more of an expected form of support compared to sleep leadership, which is demonstrated by the long history of the military devaluing sleep and the overwhelming prevalence of sleep-related disorders within the industry (e.g., Gordon et al., 2021). Additionally, there may be less opportunities for sleep leadership to arise naturally in the workplace setting, suggesting that leaders may need to be more proactive to engage in sleep leadership compared to general supervisor support or FSSB. Lastly, although the utilized scale does not measure how much employees may ask for sleep leadership, it may be the case that employees do not like to receive support for their sleep

because they could feel it is an invasion of privacy, particularly because their work leader is crossing a boundary that is often not explored in work contexts.

Through the examination of both leader and employee descriptives, we can obtain a unique understanding of how leaders rate themselves on their support behaviors compared to their direct employees. When comparing the means and standard deviations for support outcomes, it seems as though, on average, leaders and employees agree about the amount of general, familial, and sleep support that the leader provides in the workplace. This is inconsistent with what has been previously demonstrated in the support literature (e.g., Marescaux et al., 2020). Additionally, as highlighted above, descriptive statistics call attention to the fact that sleep leadership was being demonstrated much less by the leader in the workplace compared to FSSB or general supervisor support, which is agreed upon by both the leader and the employee. Overall, comparing both leader and employee reports of support behaviors provided unique preliminary insights into the leader-employee dyad. Thus, these interesting descriptive findings underscore the unique methodological contribution that the current study makes to the organizational literature, which is the inclusion and analysis of multi-source data (i.e., leaders and employees) for sleep leadership and FSSB outcomes.

The Relationship Between Sleep Quantity and Support Behaviors

Turning to the hypothesized non-significant results, leader sleep duration at Time 1 was not significantly related to employee- and leader-rated leader support behaviors at Time 3 (i.e., general supervisor support, FSSB, and sleep leadership). These results are inconsistent with the propositions of the WNS theoretical framework (Crain et al., 2018),

which suggests that sleep plays a major influential role in our attitudes, behaviors, and states in the work domain. These findings also conflict with prior research that details the relationship between sleep on the displaying of leadership styles such as laissez-faire and transformational leadership (Olsen et al., 2016), in addition to leader performance ratings (Gaultney, 2014). However, this study included 4-month and 9-month time lags to understand how the relationship between sleep, emotional exhaustion, and downstream leader behaviors unfold over time. Past research has examined sleep and leadership outcomes cross-sectionally or weekly (Gaultney, 2014; Olsen et al., 201; Svetieva et al., 2017). Thus, the discrepancy between the current study results and past findings could be due to the lags between measurement occasions, such that results may change when examined across shorter time lags such as a daily or even weekly basis. For example, FSSB and sleep leadership are inherently more emotional than general supervisory behaviors, requiring positive affect, empathy, and proactivity to effectively engage in such support behaviors (e.g., Ellis et al., 2022; Crain & Stevens, 2018; Sargent et al., 2020). Past research has demonstrated that changes in sleep quality are associated with subsequent changes in affect on a daily level (e.g., Bouwmans et al., 2017; Sonnentag et al., 2008). As such, sleep may have a more influential impact on support behaviors, but only on a short-term scale, rather than over a period of months. Therefore, the discrepancy between the findings of the current study and past research may be the result of the time lags between survey occasions.

Another alternative explanation for the lack of findings in this study is the interesting levels of sleep health of the leaders in the National Guard. Specifically, the

leaders in the present sample had healthy sleep durations with a moderate amount of variance ($M = 7.37$, $SD = 0.99$), which may have reduced the potential of this study to truly uncover a link between sleep deficiency and downstream energy and behavior outcomes because leaders were not suffering from effects of poor sleep quantity (Hirshkowitz et al., 2015; Ohayon et al., 2017; Watson et al., 2015). Therefore, on average, there was an absence of sleep deficiency within the present sample that may have had an impact on the significance of results.

Other potential alternative explanations arise when we consider each support behavior individually. For example, general supervisor support may be considered a core component of the job description of a leader, particularly within this sample of the National Guard. For this reason, general supervisor support behaviors may feel like second nature to seasoned leaders, and therefore, may not require the same or as much energetic activation as other types of behaviors that leaders are asked to engage in at work. Examples of particularly effortful leader behaviors include high-stakes negotiations, representing the company, dealing with stakeholders, budgeting, performance reviews, safety, or having to lay off employees. For example, research has shown that safety behaviors demand extra effort (e.g., Zohar & Luria, 2004; Wickens, 2014), in addition to behaviors that require empathy, such as having to lay off employees or conflict resolution (Nowack & Zak, 2020; Cameron et al.,2019). Additionally, depleted leaders are more likely to demonstrate abusive behaviors and less likely to demonstrate transformational leadership (e.g., Byrne et al., 2014). Thus, given sleep's role in replenishing energy and increasing one's tendency to invest effort in behaviors at

work, leader sleep may be less relevant for a leader's ability to do small, less strenuous behaviors, such as general supervisor support, compared to other leader tasks and behaviors.

Emotional Exhaustion as a Mediator

Furthermore, the results also indicated a non-significant indirect effect, such that leader emotional exhaustion at Time 2 was not a significant mediator between leader sleep duration at Time 1 and downstream leader support behaviors at Time 3. These results are inconsistent with the propositions of the WNS theoretical framework (Crain et al., 2018), which suggests that sleep duration and sleep quality are linked to workplace behaviors through energetic activation. These findings are also potentially inconsistent with propositions made by Quinn and colleagues' (2012) taxonomy of human energy in the workplace which suggests that energetic activation is closely linked to emotional exhaustion. In addition, sleep has been repeatedly linked to burnout, which emotional exhaustion is the key component of (e.g., Bayes et al., 2021; Ekstedt et al., 2006; Söderström et al., 2012; Toker & Melamed, 2017) suggesting that the present findings are also not in line with past research. I discuss construct validity issues as a potential alternative explanation for these inconsistent findings in the limitations section below.

Interaction between Sleep Duration and Sleep Quality

Results revealed that there was no significant interaction between leader sleep quality and leader sleep duration at Time 1 on leader emotional exhaustion at Time 2 in addition to a non-significant moderated mediation when examining the whole model. These results are inconsistent with the propositions of the WNS theoretical framework,

which suggest that an interaction effect may occur between sleep quantity and quality (Crain et al., 2018). Results are also inconsistent with the few studies that have found a significant interaction between sleep duration and sleep quality thus far (Barber et al., 2010; Barnes et al., 2015). There are key differences between the current study and the studies that have reported a significant interaction. Specifically, both studies were examined on a daily level whereas the present study examined the interaction between leader sleep duration and leader sleep quality on leader emotional exhaustion over a 4-month time lag, suggesting that there may be too long of a lag between the measurement occasions for sleep variables and emotional exhaustion which resulted in non-significant results. Additionally, both studies examined different outcomes other than emotional exhaustion. Specifically, Barber and colleagues (2010) found a significant link between sleep duration and sleep quality on psychological strain, whereas Barnes and colleagues (2015) found the significant interaction with daily ego depletion as the outcome. Both outcomes (i.e., psychological strain and daily ego depletion) may be more proximal to energy-related outcomes of sleep compared to emotional exhaustion, which may explain the lack of significant findings in the present study. Finally, the samples utilized in previous studies differ from the sample drawn from in this study. Barnes and colleagues (2015) utilize data from private and public firms both in the U.S. and Italy which is more representative of the average civilian job compared to that of the National Guard. Additionally, Barber and colleagues (2010) utilize data from undergraduate students at a university. The difference in samples may account for the non-significance of the interaction on leader emotional exhaustion, as the interaction between sleep duration and

sleep quality may show up in different ways in different samples because of variations in sleep detriments as well as organizational or job characteristics. For example, compared to undergraduate students at a university, the National Guard involves potentially high-risk tasks such as training for domestic emergencies like natural disasters, or working with heavy military machinery, such as airplanes or weapons, which may impact sleep. Another difference is that the National Guard may have a more regimented schedule and less competing demands when engaging in work for the National Guard compared to undergraduate students. For example, research has demonstrated that undergraduate students are prone to experiencing substantial issues with sleep duration and sleep quality due to shifting schedules (e.g., overlapping deadlines, working late hours, testing structures), competing demands (e.g., second job, social lives, late-night activities), or financial stressors (e.g., cost of living, tuition) (e.g., Gardani et al., 2022).

Unexpected and Non-hypothesized Findings

No hypotheses from this study were supported, yet inspection of the correlation table and all modeled paths within the fully-saturated models led to some interesting and unexpected findings. As these effects were not hypothesized, I describe them here rather than in the results section. See Table 4 for a summary of unexpected and non-hypothesized findings. First, controlling for all other variables in the model, results revealed significant direct effects from leader ratings of emotional exhaustion at Time 2 to employee-ratings of general supervisor support at Time 3, employee-ratings of FSSB at Time 3, and employee-ratings of sleep leadership at Time 3. This suggests that leader emotional exhaustion is significantly and negatively related to the way the leaders'

employees perceive their leader's ability to provide general, familial, and sleep support 5-months later. Specifically, as a leader's emotional exhaustion increases, their employees perceive their leader's support behaviors to significantly decrease. Thus, these unexpected results reveal that a leader's emotional exhaustion is a critical factor in their ability to provide support to employees over time. Even more interesting is that emotional exhaustion was not significantly associated with a *leader's* perceptions of their own support behaviors, such that leaders who are more emotionally exhausted may not think they provide nonwork and work support to their employees any differently than if they were less emotionally exhausted. Although results did not demonstrate potential linking mechanisms between sleep and workplace behavior via emotional exhaustion, emotional exhaustion is closely aligned with the energetic activation component of both the WNS framework (2018) and Quinn and colleagues' (2012) taxonomy of human energy. Both theories suggest that such energy impacts downstream behavior and thus, these results lend support to each of the utilized theories.

Model results also revealed two significant interactions when controlling for all other variables in the model. First, there was a significant interaction between leader sleep duration at Time 1 and leader insomnia symptoms at Time 2 on employee-ratings of FSSB at Time 3, such that the positive relationship between leader sleep duration and employee-ratings of FSSB was strengthened under conditions of high leader insomnia symptoms. Additionally, results revealed that the relationship between leader sleep duration at Time 1 and employee-ratings of sleep leadership at Time 3 was significantly moderated by leader insomnia symptoms at Time 1, such that the positive relationship

between leader sleep duration and employee-ratings of sleep leadership was strengthened under conditions of high leader insomnia symptoms. Thus, leaders who generally sleep more, are more likely to provide better support. However, a supportive leader may be having long enough sleep periods (i.e., high sleep duration), but have high insomnia symptoms because they are ruminating about work-related tasks such as supporting their employees needs in both the familial and sleep domains, resulting in an increase in such behaviors as reported by their employees. Finally, there was a significant interaction between leader sleep duration at Time 1 and leader sleep dissatisfaction at Time 1 on leader-ratings of sleep leadership at Time 3, such that under conditions of low sleep dissatisfaction (i.e., high sleep quality), the relationship between sleep duration and leader-ratings of sleep leadership was negative and stronger than the relationship between leader sleep duration and leader-ratings of sleep leadership when sleep dissatisfaction was high. Thus, leaders who experience high insomnia symptoms and high sleep duration, or low sleep dissatisfaction and high sleep duration, may be more sympathetic towards employees with familial demands or sleep-related barriers and therefore may be more likely to demonstrate these support behaviors at work, regardless of their sleep health. Additionally, the leader may be more aware of how their sleep impacts their work if they are suffering from sleep deficiencies and therefore, may be more likely to advocate or provide support for sleep in the workplace.

Interestingly, these unexpected and non-hypothesized results reveal that the interaction between leader sleep duration and leader insomnia symptoms are significantly linked to employee-ratings of both FSSB and sleep leadership, but not employee-ratings

of general supervisor support. Thus, as hypothesized previously, sleep may not be as strongly linked to a leader's ability to provide general support compared to more emotional, non-work support such as FSSB and sleep leadership. This further lends support for why the direct relationship between leader sleep duration and general supervisor support was found to be non-significant, such that the association of sleep duration on downstream general supervisor support may be reduced because general supervisor support behaviors may feel overall less taxing and be more automatic regardless of sleep.

Overall, the present study responds to calls made by the WNS authors to examine the interaction effect of sleep duration and sleep quality as well as explore sleep-related associations over time (Crain et al., 2018). Results lend support to Crain and colleagues' (2018) WNS framework as the interaction between leader sleep duration and leader insomnia symptoms was significantly associated downstream employee-rated FSSB and employee-rated sleep leadership, in addition to a significant interaction between leader sleep duration and leader sleep dissatisfaction which was significantly linked to downstream leader-ratings of sleep leadership. The present study advances this literature and provides more empirical support for this interactive relationship, informing future research by identifying how the indirect relationship between sleep duration and different positive leader behaviors may be enhanced by sleep quality.

Practical Implications

Overall, this work has implications for practitioners, organizations, and public health campaigns. Although the hypothesized relationships were found to be non-

significant, the unexpected and non-hypothesized findings hold practical value. Prior research has shown that sleep health can be improved through sleep hygiene behaviors, such as not drinking caffeine or using technology close to bedtime, as well as mindfulness exercises (e.g., Harvey, 2000; Howell et al., 2010; Mastin et al., 2016; Shallcross et al., 2019). Although leaders can use this research to take a proactive approach to support their own sleep, organizations that value leader health and want leaders to thrive at work should consider providing resources in the form of sleep hygiene and mindfulness trainings. Additionally, results revealed that if leaders have high sleep duration and high insomnia symptoms, their employees are likely to perceive the leader to be providing FSSB or sleep leadership. However, this indicates that leaders are potentially exchanging quality sleep for work-related ruminating that is increasing their downstream support behaviors. These significant, non-hypothesized interactions suggest that both sleep duration and sleep quality play a unique and potentially different role in downstream support behaviors exhibited by the leader and perceived by the employee. Accordingly, organizations should aim to promote procedures and policies that are sleep-friendly. For example, organizations could directly address or dismantle harmful cultural signals that lead to perceptions that working more and sacrificing sleep will lead to more success as a leader. Another suggestion is for organizations to enforce a strict cut off time for work outside of regular work hours. For example, having an organizational-wide policy that workers are not expected to be on email past 5 p.m. may allow for improved segmentation between the work and nonwork domain, leaving more time and space for

leaders avoid work-related rumination (e.g., Melo et al., 2021; Sonnentag & Fritz, 2015) and prioritize their sleep health.

Furthermore, organizations who want to promote or enhance employee perceptions of leader support behaviors should prioritize initiatives that reduce the level of emotional exhaustion that leaders are experiencing, such as mindfulness-based stress reduction interventions (Hülsheger et al., 2013; McFarland & Hlubocky, 2021). Research has suggested that leaders within an organization may serve as a great point of intervention as they bridge the gap between an employee's work and nonwork life (Hammer et al., 2021; Major & Lazun, 2010). Various supervisor interventions that have been conducted in past literature suggest that training supervisors to be more supportive for an employee's nonwork life can have impactful results for employee health, well-being, and work-related outcomes (e.g., Brady et al., 2021; Hammer et al., 2011; Hammer et al., 2019; Hammer et al., 2020; Odle-Dusseau et al., 2016; Perry et al., 2020). However, non-hypothesized results revealed that if leaders are emotionally exhausted, their direct employees are not likely to perceive the leader to be supportive of their familial or sleep-related demands. Thus, practitioners should aim to reduce emotional exhaustion among leaders to improve upon the effectiveness of leader-based interventions for promoting support behaviors such as FSSB and sleep leadership.

Finally, this study can inform public health campaigns. Components of leader sleep quality were found to significantly strengthen the relationship between leader sleep duration and downstream employee perceptions of the leader's FSSB and sleep leadership and leader perceptions of sleep leadership. This underscores the importance of

sleep quality in downstream support behaviors in the work domain. Thus, public health campaigns could shift the rhetoric away from only increasing sleep duration, and place equal emphasis on improving sleep quality. For example, instead of only promoting a bedtime calculator aimed at improving sleep duration, the "7 and up" campaign (American Academy of Sleep Medicine, 2021) could also incorporate information or tools related to sleep hygiene (i.e., sleep habits related to sleep quality such as maintaining a consistent sleep schedule or avoiding alcohol or caffeine before bed; Mastin et al., 2006) to help people improve their sleep quality and prevent insomnia symptoms as well. Additionally, public health campaigns could begin supporting education initiatives about the importance of understanding both sleep quantity and sleep quality and how they are different.

Limitations and Future Directions

Next, I discuss a number of limitations of the current study. These limitations include considerations regarding study design, generalizability, measurement, and theory. Furthermore, I discuss ways to address these limitations as well as outline important and interesting research avenues for future studies.

Study design considerations

The main limitation of the present study is statistical power and sample size. Statistical power depends on sample size at each level of the model in multilevel analyses (Snijders, 2005). There was likely an insufficient sample size at the leader level to detect significant relationships among study variables, as there were approximately 175 leaders in the final sample after matching of leaders to employees and cleaning of all data. Kline

(2011) recommends a minimum of 200 cases for multilevel modeling. Further, Kline (2011) describes how 200 individual cases may even be too small for complex models. Most researchers agree that structural equation modeling and multilevel models are "large-sample" analyses. Thus, this study suffered from insufficient power due to leader sample size, especially when considering the complexity of this model, which may account for the discrepancies in hypothesized relationships and the results.

Furthermore, the time lags between measurement occasions are a limitation of this study. In accordance with previous recommendations for longitudinal studies on sleep and workplace outcomes (e.g., Crain et al., 2018), this study included 4-month and 9-month time lags to understand how the relationship between sleep, emotional exhaustion, and downstream leader behaviors unfold over time. Although longitudinal research is beneficial, future research should also examine these relationships occur over shorter time lags, such as with day level analyses. For example, daily diary studies may reveal that on days where the supervisor reported less sleep and worse sleep quality, they also reported more emotional exhaustion and decreased positive behaviors at work the following day. Thus, future research should attempt to examine the relationship between sleep and leader outcomes using shorter time lags.

Generalizability considerations

Another limitation is the generalizability of results to other samples. The sample used for this study is derived from a larger intervention study implemented in a military sample aimed to improve sleep and health outcomes. Utilizing a sample within the National Guard may limit the generalizability of the results of this study to more civilian

populations as well as to more traditional military populations. Although leaders and employees included this study were full-time employees working in a variety of positions such as human resources or finance/supply, the participants still work under the National Guard context which may have some nuances compared to non-governmental organizations. For example, National Guard employees are subject to routine trainings for high-risk and high-stress situations, such as domestic emergencies or counter-drug efforts, suggesting that they may be on-call for such events. Additionally, some positions within the National Guard are safety-sensitive due to direct contact with heavy machinery such as airplanes or weapons. However, the variety of job types represented in the sample does improve generalizability in comparison to other studies that are strictly focused on active-duty soldiers. Overall, future research should replicate this study across different occupations as leader support is important regardless of job. Populations that would be particularly interesting are those that have atypical schedules (e.g., shiftwork, night work) such as nursing, the restaurant industry, or hotels, or even occupations in which employees often travel such as construction, professional athletes, or flight attendants. Additionally, given the ongoing global pandemic, it would be especially interesting to examine the role of sleep in downstream leader support behaviors in jobs that have become "front-line" such as first responders, personal care aids, grocery store employees, or fast-food workers, as well as jobs that have moved to a more remote nature.

Measurement considerations

The measures used for this study also present limitations. First, the instructions for the sleep quality and sleep duration scales varied such that participants were asked to

report their average sleep duration over the past month whereas participants were asked to report their sleep quality over the past week. This shorter time frame was intentionally chosen for sleep quality as participants could more accurately report on their experiences of sleep quality when thinking about the last seven days in comparison to the last month. Future studies should consider aligning the time frames given to participants for subjective reports of sleep duration and sleep quality. Additionally, this study relies on individuals' subjective appraisal of their sleep duration and sleep quality. Although research has indicated that self-report sleep measures are valid and reliable, objective measures using actigraph watches to record physiological measurements of activity and rest periods are recommended in addition to self-reports to provide a more holistic understanding of an individual's sleep (e.g., Ganster et al., 2018; Landry et al., 2015). Future research should attempt to understand these hypothesized relationships between sleep and leader behavior outcomes using objective measures of sleep duration and quality.

Similarly, another limitation is the construct validity and framing of the emotional exhaustion scale. When looking at the individual items, the emotional exhaustion measure used does not necessarily represent the core component of burnout (i.e., low energy) more than it represents the leader's ability for investing emotionally in other people. Although the items are consistent with Shirom and Melamed's (2006) widely used conceptualization of emotional exhaustion, this measure may be tapping into emotional interpersonal capacity or emotional investment of the leader. The current study places emphasis on sleep's role in the replenishment energy and uses WNS theoretical

proposition that suggests sleep is linked to downstream behavior outcomes via energetic activation (Crain et al., 2018). However, emotional exhaustion measure was not directly tapping into the energy component of burnout and emotional exhaustion as hypothesized, more than it was tapping into an outcome of the presence or absence of emotional exhaustion. Thus, emotional exhaustion may be serving as a proxy in this study for emotional energy and it may be too distal from what was theoretically hypothesized to result in significant relationships. This study could be improved upon by considering mediators that were more accurately and proximally measuring the energy component of emotional exhaustion. Future studies interested in examining energy's mediating role in the relationship between sleep and downstream behaviors should consider other mediators that are less distal and more directly representative of energy such energetic activation, ego depletion, or self-regulation. Given the significant interactions of this study, another potentially fruitful avenue would be to examine how leader rumination at night may mediate the relationship between sleep predictors and support behavior outcomes. Finally, other potentially interesting mediators could be perceived partner responsiveness which represents one's evaluation of spousal resources or perceived stress which represents a lack of resources.

Additionally, the core hypotheses of this study are concerned with understanding the extent to which leaders feel emotionally exhausted when engaging with their employees. In contrast, the instructions and items of this scale ask participants to think about their interactions with "coworkers" (e.g., "I feel I am unable to be sensitive to the needs of coworkers"). These prompts do not provide a clear idea about who "coworkers"

is referring to and thus, leaders were not explicitly directed to consider their interactions with their direct employees when answering the items. This may impact the results of the study given that leaders could potentially be considering their interactions with different people within the organization, such as colleagues at the same level, their own boss, or their employees. Within each of these relationships, the symptoms of emotional exhaustion may show up differently. For example, leaders may report more emotional exhaustion when prompted to consider their interactions with their employees compared to the emotional exhaustion they may experience when engaging with other leaders. Future research should attempt to align the language of the emotional exhaustion scale items with the dyadic relationship of interest (e.g., "I feel I am unable to be sensitive to the needs of my employees").

Another limitation is that this study utilized the short-form measure of FSSB. Although this was a specific design choice to prevent participant testing fatigue, it restricts our understanding of how sleep and emotional exhaustion may be linked to different dimensions of FSSB. For this reason, future research should utilize the full measure of FSSB to explore how sleep may differentially be associated with emotional support, instrumental support, role-modeling, and creative work-family management through the mediator of emotional exhaustion. Taking this direction could lend insight into future interventions aimed at promoting FSSB in the workplace by understanding how the four dimensions of FSSB may be differentially affected by sleep.

Theoretical considerations

Finally, the present study does not perfectly test the WNS theoretical framework. Although this study draws from the core tenets suggested by Crain and colleagues (2018), future research should attempt to test the whole theoretical model to understand how the relationships between sleep, emotional exhaustion, and leader behaviors may change when examined holistically. In particular, the WNS model suggests that sleep both precedes and follows work and nonwork domain attitudes, behaviors, and states. Although the present study examines upstream sleep, it would be a particularly interesting avenue for future research to also consider how these hypothesized relationships and work behavior outcomes could impact downstream sleep. For example, leaders who feel like they are failing to provide adequate support to their employees may experience large detriments to their sleep due to rumination. This study also places emphasis on work domain behaviors; however, it is equally important to produce research that gives us an understanding into how leader sleep may also impact leader's work attitudes and states as well as nonwork behaviors, attitudes, and states. For example, leader sleep may be linked to perceptions of self-efficacy in their job or even improvements of creativity, and these may subsequently be associated with downstream performance in the form of support behaviors.

Additionally, this study emphasized the role of energetic activation as the mediator between sleep and behavior outcomes but did not consider the role of physical energy. Researchers interested in testing physical energy as a mediating mechanism should consider utilizing wearable accelerometer devices to measure activity levels, heart

rate, and a calculation of oxygen consumption (Butte et al., 2012; Hills et al., 2014). Interestingly, although the WNS framework suggests time as a finite resource, this study was not able to test the influence of perceived time on hypothesized relationships. Time is likely to play a large role in the relationship between sleep and downstream work and nonwork outcomes, suggesting that this may be a particularly impactful avenue for future studies to attempt to uncover the role of time in the associations between sleep, emotional exhaustion, and leader behavior. Finally, given the research on leaders' sacrificing of sleep for work (Ruderman et al., 2017), it is critically important to assess how leader sleep may impact relationship satisfaction or work-family conflict, as it may be over and above what non-leader employees experience due to the implicit association of work hours and success among workplace leaders.

Conclusion

By drawing from the work, nonwork, and sleep (WNS) theoretical framework (Crain et al., 2018), the present study aimed to investigate the relationship between leader sleep on a constellation of downstream leader- and employee-rated support behaviors in the workplace (i.e., general supervisor support, FSSB, and sleep leadership). This study also aimed to pinpoint the linking mechanism between leader sleep and support behaviors as leader emotional exhaustion, as well as explore the interaction between leader sleep duration and sleep quality (i.e., insomnia symptoms and sleep dissatisfaction). Results demonstrated that hypothesized relationships were non-significant. Interestingly, non-hypothesized results suggested that leader emotional exhaustion has a significant direct and negative relationship with downstream employee-rated support behaviors.

Additionally, unexpected results revealed significant interactions, such that under specific conditions of leader low sleep quality, the relationship between leader sleep duration and downstream employee and leader rated support behaviors is strengthened. From these findings, researchers, practitioners, workplace leaders, and organizations should prioritize initiatives that reduce and prevent leader emotional exhaustion as well as promote sleep health. Public health campaigns should also educate and advocate for the importance of sleep quality in addition to sleep duration.

Table 1
Descriptive Statistics and Correlations Among Study Variables

Variable	*N*	*M*	*SD*	1	2	3	4	5	6	7	8
1. Sleep Duration (T1)	175	7.37	0.99								
2. Insomnia Symptoms (T1)	175	52.47	7.14	.12*	.82						
3. Sleep Dissatisfaction (T1)	175	52.31	7.07	.01	.53**	.87					
4. Emotional Exhaustion (T2)	145	2.16	1.00	.03	.16**	.08	.78				
5. Life Satisfaction (T2)	146	3.74	0.65	.07	-.08	-.18**	-.20**	.87			
6. FSSB at T3 (ER)	294	4.11	0.90	.05	-.05	-.01	-.13*	-.07	.95		
7. Sleep Leadership at T3 (ER)	293	2.51	0.48	-.02	-.04	-.03	-.14*	-.09	.52**	.94	
8. General Supervisor Support at T3	290	4.23	0.84	.05	-.08	-.04	-.16*	-.08	.73**	.39**	.78
9. FSSB at T3 (LR)	128	4.10	0.49	-.10	-.12*	-.01	-.32*	.20**	.02	-.01	.03
10. Sleep Leadership at T3 (LR)	128	2.70	0.78	-.08	-.14*	-.05	-.08	-.02	-.03	-.03	-.04
11. Branch of Service at T1(E)	393	0.53	0.50	-.21**	-.14**	-.11*	-.11	.29**	.06	-.02	.04
12. Condition at T1 (E)	393	0.57	0.50	-.07	.52	-.01	.17**	.00	-.02	.03	.03
13. Number of children at T1 (E)	389	1.20	1.21	-.01	-.01	.01	-.08	-.02	-.12	-.02	-.14*
14. Eldercare at T1 (E)	393	0.05	0.22	.10*	.10*	.03	.06	-.04	.05	-.05	-.01
15. Shiftwork at T1 (E)	393	0.81	0.39	.09	.92	.07	.08	-.06	-.06	-.05	.03
16. Branch of Service at T1 (L)	178	0.56	0.50	-.14**	-.14**	-.11*	-.11	.29**	.06	-.02	.04
17. Condition at T1 (L)	178	0.48	0.50	.03	.03	-.02	.15**	.00	-.03	.02	.02
18. Number of children at T1 (L)	174	1.71	1.40	-.03	-.03	-.06	.18**	-.08	-.05	.00	-.03
19. Eldercare at T1 (L)	178	0.05	0.22	.01	.06	.12*	-.03	.06	.02	.01	-.04
20. Shiftwork at T1 (L)	178	0.89	0.21	.06	.00	.16**	-.12*	-.02	-.02	-.04	-.04

Note. E = Employee, L = Leader, ER = Employee Rating, LR= Leader Rating. T1 = Time 1, T2 = Time 2, T3 = Time 3. Sleep Duration variable is in hours. Insomnia Symptoms and Sleep Dissatisfaction have t-score transformations. Branch of service (0 = Army, 1 = Air). Condition (0 = Control, 1 = Treatment). Number of children living at home (0-11). Eldercare (1 = Yes, 0 = No). Work schedule (0 = Other, 1 = Regular Daytime). Values reported on the diagonals are alphas. * $p < .05$, ** $p < .01$

Table 1 Continued

Descriptive Statistics and Correlations Among Study Variables

Variable	9	10	11	12	13	14	15	16	17	18	19	20
1. Sleep Duration (T1)												
2. Insomnia Symptoms (T1)												
3. Sleep Dissatisfaction (T1)												
4. Emotional Exhaustion (T2)												
5. Life Satisfaction (T2)												
6. FSSB at T3 (LR)												
7. Sleep Leadership at T3 (ER)												
8. General Supervisor Support (T3)												
9. FSSB at T3 (LR)	.89											
10. Sleep Leadership at T3 (LR)	.22**	.88										
11. Branch of Service at T1 (E)	.21**	-.09										
12. Condition at T1 (E)	.12*	-.06	.16**									
13. Number of children at T1 (E)	-.06	-.02	.00	.01								
14. Eldercare at T1 (E)	.06	.01	-.03	-.02	-.05							
15. Shiftwork at T1 (E)	-.16**	-.06	-.30**	-.05	.05	.02						
16. Branch of Service at T1 (L)	.21**	-.09	.10**	.16**	.00	-.03	-.28**					
17. Condition at T1 (L)	.10	-.07	.18**	.97**	.01	-.03	-.05	.18**				
18. Number of children at T1 (L)	-.17**	-.11	-.07	.16**	-.03	.05	.05	-.07	.15**			
19. Eldercare at T1 (L)	.01	.02	-.05	-.02	.11*	.06	.05	-.05	-.03	-.02		
20. Shiftwork at T1 (L)	.04	-.12*	-.07	.01	.08	-.05	.30**	-.07	.02	-.04	-.01	

Note. E = Employee, L = Leader, ER = Employee Rating, LR= Leader Rating. T1 = Time 1, T2 = Time 2, T3 = Time 3. Sleep Duration variable is in hours. Insomnia Symptoms and Sleep Dissatisfaction have t-score transformations Branch of service (0 = Army, 1 = Air). Condition (0 = Control, 1 = Treatment). Number of children living at home (0-11). Eldercare (1 = Yes, 0 = No). Work schedule (0 = Other, 1 = Regular Daytime). * $p < .05$, ** $p < .01$

Table 2

Direct Effects of Key Variables, Emotional Exhaustion

	Outcomes					
	Emotional Exhaustion	GSS(E)	FSSB(L)	FSSB(E)	Sleep Leadership (L)	Sleep Leadership (E)
Predictor	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)
Sleep Duration	-0.03 (0.10)	0.06 (0.05)	-0.01 (0.08)	0.06 (0.07)	-0.05 (0.11)	-0.06 (0.08)
Sleep Dissatisfaction	-0.02 (0.12)	0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	0.02 (0.02)	-0.04 (0.07)
Insomnia Symptoms	0.12 (0.14)	-0.01 (0.01)	-0.01 (0.02)	-0.01 (0.01)	-0.02 (0.02)	0.04 (0.05)
Duration x Dissatisfaction	0.02 (0.02)	-0.01 (0.01)	-0.01(0.01)	-0.01 (0.01)	-0.04 (0.02)*	0.01 (0.01)
Duration x Insomnia	-0.01 (0.02)	0.01 (0.01)	0.01 (0.01)	0.02 (0.01)*	0.01(0.02)	0.03 (0.01)**
Branch of Service	-0.09 (0.10)	0.06 (0.12)	0.10 (0.16)	0.12 (0.14)	-0.24 (0.21)	-0.04 (0.06)
Condition	0.10 (0.08)*	0.09 (0.10)	0.24 (0.13)†	-0.04 (0.12)	0.05 (0.19)	0.03 (0.06)
Number of children	0.14 (0.07)*	-0.11 (0.06)†	-0.07 (0.06)	-0.09 (0.06)	-0.10 (0.07)	-0.05 (0.07)
Eldercare	0.02 (0.07)	-0.05 (0.23)	0.10 (0.37)	0.23 (0.26)	-0.23 (0.55)	-0.04 (0.06)
Work Schedule	-0.03 (0.08)	0.10 (0.20)	-0.26 (0.20)	-0.14 (0.19)	-0.56 (0.45)	-0.07 (0.10)
Emotional Exhaustion	N/A	-0.15 (0.06)**	-0.14 (0.07)†	-0.13 (0.04)**	-0.01 (0.07)	-0.18 (0.06)***
Model R^2	0.62	0.06	0.18	0.07	0.17	0.09

Note. *b* = Unstandardized Direct Effect. *SE* = Standard Error. E = Employee. L = Leader. FSSB = Family supportive supervisor behaviors. GSS = General Supervisor Support. Sleep Duration variable is in hours. Branch of service (0 = Army, 1 = Air). Condition (0 = Control, 1 = Treatment). Number of children living at home 3 days a week (0-11). Eldercare (1 = Yes, 0 = No). Work schedule (0 = Other, 1 = Regular Daytime Schedule). Employee control variables (i.e., Branch of service, condition, number of children, eldercare, work schedule) were used for employee-rated outcomes whereas supervisor variables were used for supervisor/self-rated outcomes. Results reported in this table are those from the supervisor models. Results did not change significantly when examining employee models. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Table 3
Indirect Effects for Emotional Exhaustion

	Indirect Effect	*b*	*SE*	95% CI
Mediation	Sleep Duration → Emotional Exhaustion → GSS (E)	0.012	0.016	-0.015, 0.055
	Sleep Duration → Emotional Exhaustion → FSSB (L)	0.004	0.014	-0.014, 0.045
	Sleep Duration →Emotional Exhaustion → FSSB (E)	0.010	0.015	-0.012, 0.047
	Sleep Duration → Emotional Exhaustion → Sleep Leadership (L)	0.001	0.010	-0.008, 0.033
	Sleep Duration → Emotional Exhaustion →Sleep Leadership (E)	0.016	0.020	-0.018, 0.063
Moderation	Duration x Sleep Dissatisfaction → Emotional Exhaustion	0.017	0.018	-0.012, 0.051
	Duration x Insomnia Symptoms → Emotional Exhaustion	-0.011	0.021	-0.053, 0.029
Moderated Mediation	Duration x Dissatisfaction → Emotional Exhaustion → GSS (E)	-0.003	0.003	-0.010, 0.001
	Duration x Dissatisfaction → Emotional Exhaustion → FSSB (L)	-0.002	0.003	-0.010, 0.000
	Duration x Dissatisfaction → Emotional Exhaustion → FSSB (E)	-0.002	0.003	-0.008, 0.001
	Duration x Dissatisfaction → Emotional Exhaustion → Sleep Leadership (L)	0.000	0.002	-0.006, 0.002
	Duration x Dissatisfaction → Emotional Exhaustion →Sleep Leadership (E)	-0.003	0.003	-0.011, 0.002
	Duration x Insomnia Symptoms → Emotional Exhaustion → GSS (E)	0.002	0.003	-0.004, 0.010
	Duration x Insomnia Symptoms → Emotional Exhaustion → FSSB (L)	0.000	0.003	-0.004, 0.007
	Duration x Insomnia Symptoms → Emotional Exhaustion → FSSB (E)	0.001	0.003	-0.003, 0.009
	Duration x Insomnia Symptoms → Emotional Exhaustion → Sleep Leadership (L)	0.000	0.002	-0.002, 0.005
	Duration x Insomnia Symptoms → Emotional Exhaustion →Sleep Leadership (E)	0.002	0.004	-0.005, 0.010

Note. All values were obtained from 5,000 bias-corrected bootstrapped samples in fully saturated path models testing direct and indirect effects. b = Unstandardized Indirect Effect. SE = Standard Error. CI = Confidence Interval. E = Employee-rating. L = Leader-rating. FSSB = Family Supportive Supervisor Behaviors. GSS = General Supervisor Support

Table 4
Additional Analyses

	Indirect Effect	*b*	*SE*	95% CI	*pvalue*
Moderations on Outcomes	Duration x Sleep Dissatisfaction → GSS (E)	-0.005	0.011	-0.024, 0.018	0.651
	Duration x Sleep Dissatisfaction → FSSB (L)	-0.013	0.013	-0.039, 0.015	0.332
	Duration x Sleep Dissatisfaction → FSSB (E)	-0.052	0.092	-0.029, 0.018	0.571
	Duration x Sleep Dissatisfaction → Sleep Leadership (L)	-0.040	0.020	-0.079, 0.003	0.048
	Duration x Sleep Dissatisfaction → Sleep Leadership (E)	0.007	0.012	-0.019, 0.027	0.566
	Duration x Insomnia Symptoms → GSS (E)	0.008	0.009	-0.014, 0.023	0.360
	Duration x Insomnia Symptoms → FSSB (L)	0.012	0.012	-0.013, 0.032	0.296
	Duration x Insomnia Symptoms → FSSB (E)	0.162	0.082	-0.001, 0.036	0.048
	Duration x Insomnia Symptoms → Sleep Leadership (L)	0.012	0.020	-0.031, 0.041	0.536
	Duration x Insomnia Symptoms → Sleep Leadership (E)	0.029	0.011	0.003, 0.045	0.009

Note. All values were obtained from 5,000 bias-corrected bootstrapped samples in fully saturated path models testing direct and indirect effects. b = Unstandardized Indirect Effect. SE = Standard Error. CI = Confidence Interval. E = Employee-rating. L = Leader rating. FSSB = Family Supportive Supervisor Behaviors. GSS = General Supervisor Support

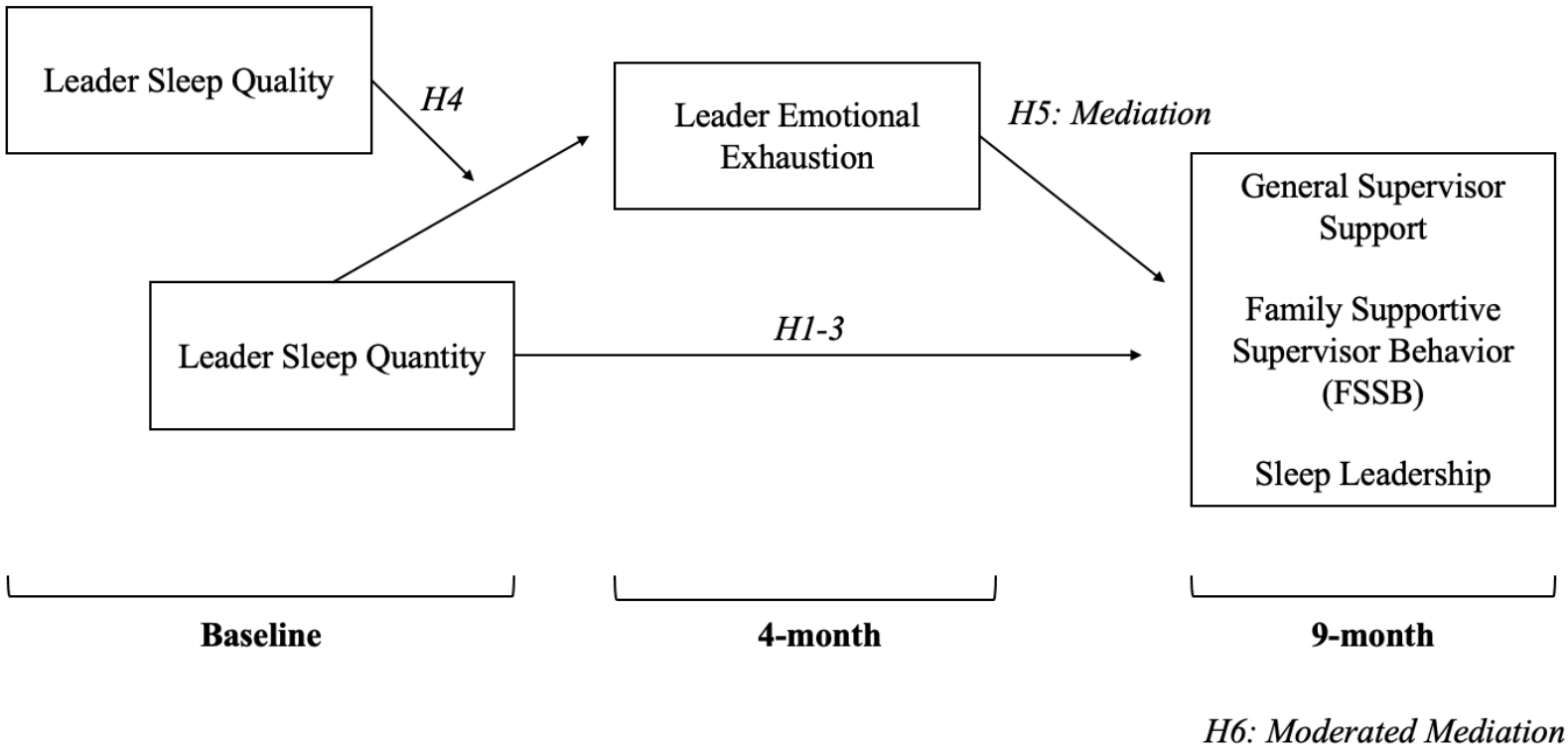

Figure 1. Time lagged moderated mediation model of leader sleep duration at Time 1 (i.e., Baseline) on emotional exhaustion at Time 2 (i.e., 4-month), moderated by supervisor sleep quality at Time 1 (i.e., Baseline), on general supervisor support, FSSB, and sleep leadership at Time 3 (i.e., 9-month). Both leaders and their direct employees provided ratings of FSSB and sleep leadership. Control variables (i.e., work schedule, Army vs. Air, child/eldercare responsibilities) not shown

Table 5
Indirect Effects for Life Satisfaction

	Indirect Effect	*b*	*SE*	95% CI
Mediation	Sleep Duration →Life Satisfaction → GSS (E)	-0.009	0.015	-0.065, 0.005
	Sleep Duration →Life Satisfaction →FSSB (L)	0.016	0.017	-0.006, 0.061
	Sleep Duration → Life Satisfaction →FSSB (E)	-0.010	0.015	-0.071, 0.004
	Sleep Duration →Life Satisfaction →Sleep Leadership (L)	0.009	0.019	-0.016, 0.091
	Sleep Duration →Life Satisfaction →Sleep Leadership (E)	-0.012	0.020	-0.073, 0.010
Moderation	Duration x Sleep Dissatisfaction → Life Satisfaction	0.008	0.010	-0.011, 0.029
	Duration x Insomnia → Life Satisfaction	-0.007	0.010	-0.030, 0.008
Moderated Mediation	Duration x Dissatisfaction → Life Satisfaction → GSS (E)	-0.001	0.002	-0.010, 0.001
	Duration x Dissatisfaction →Life Satisfaction → FSSB (L)	0.003	0.003	-0.001, 0.015
	Duration x Dissatisfaction → Life Satisfaction → FSSB (E)	-0.001	0.002	-0.009, 0.001
	Duration x Dissatisfaction →Life Satisfaction → Sleep Leadership (L)	0.001	0.003	-0.001, 0.009
	Duration x Dissatisfaction →Life Satisfaction →Sleep Leadership (E)	-0.002	0.003	-0.011, 0.001
	Duration x Insomnia →Life Satisfaction → GSS (E)	0.001	0.002	0.000, 0.012
	Duration x Insomnia →Life Satisfaction → FSSB (L)	-0.001	0.002	-0.009, 0.001
	Duration x Insomnia → Life Satisfaction → FSSB (E)	0.001	0.002	0.000, 0.010
	Duration x Insomnia →Life Satisfaction → Sleep Leadership (L)	0.000	0.002	-0.009, 0.001
	Duration x Insomnia →Life Satisfaction→Sleep Leadership (E)	0.001	0.002	-0.001, 0.009

Note. All values were obtained from 5,000 bias-corrected bootstrapped samples in fully saturated path models testing direct and indirect effects. b = Unstandardized Indirect Effect. SE = Standard Error. CI = Confidence Interval. E = Employee-rating. L = Leader-rating. FSSB = Family Supportive Supervisor Behaviors. GSS = General Supervisor Support

Table 6
Direct Effects of Key Variables, Life Satisfaction

	Outcomes					
	Life Satisfaction	GSS(E)	FSSB(L)	FSSB(E)	Sleep Leadership(L)	Sleep Leadership(E)
Predictor	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)
Sleep Duration	0.07 (0.07)	0.08 (0.05)	-0.02 (0.01)	0.07 (0.07)	-0.06 (0.11)	-0.04 (0.08)
Sleep Dissatisfaction	-0.02 (0.01)	0.00 (0.01)	0.01 (0.02)	0.00 (0.01)	0.02 (0.02)	-0.01 (0.01)
Insomnia Symptoms	0.00 (0.01)	-0.01 (0.01)	-0.01 (0.02)	-0.01 (0.01)	-0.02 (0.02)	0.00 (0.01)
Duration x Dissatisfaction	0.01 (0.01)	-0.01 (0.01)	-0.02 (0.01)	-0.01 (0.01)	-0.04 (0.02)*	0.01 (0.01)
Duration x Insomnia	-0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	0.02 (0.01)**	0.01 (0.02)	0.03 (0.01)**
Branch of Service	0.36 (0.13)**	0.13 (0.15)	0.04 (0.20)	0.18 (0.14)	-0.27 (0.19)	0.01 (0.15)
Condition	-0.06 (0.11)	0.03 (0.11)	0.23 (0.14)	-0.09 (0.13)	0.06 (0.19)	-0.00 (0.12)
Number of children	-0.01 (0.03)	-0.10 (0.06)	-0.08 (0.06)	-0.09 (0.06)	-0.11 (0.07)	-0.04 (0.05)
Eldercare	0.05 (0.52)	-0.06 (0.22)	0.08 (0.45)	0.22 (0.25)	-0.24 (0.59)	-0.22 (0.29)
Work Schedule	-0.12 (0.26)	0.09 (0.19)	-0.27 (0.23)	-0.16 (0.18)	-0.57 (0.42)	-0.19 (0.24)
Life Satisfaction	N/A	-0.13 (0.11)	0.22 (0.12)†	-0.15 (0.10)	0.09 (.17)	-0.19 (0.14)
Model R^2	0.14	0.05	0.19	0.06	0.18	0.08

Note. All values were obtained from 5,000 bias-corrected bootstrapped samples. *b* = Unstandardized Direct Effect. *SE* = Standard Error. E = Employee. L = Leader. FSSB = Family supportive supervisor behaviors. GSS = General Supervisor Support. Sleep Duration variable is in hours. Branch of service (0 = Army, 1 = Air). Condition (0 = Control, 1 = Treatment). Number of children living at home 3 days a week (0-11). Eldercare (1 = Yes, 0 = No). Work schedule (0 = Other, 1 = Regular Daytime Schedule). Employee control variables (i.e., Branch of service, condition, number of children, eldercare, work schedule) were used for employee-rated outcomes whereas supervisor variables were used for supervisor/self-rated outcomes. Results reported in this table are those from the supervisor models. Results did not change significantly when examining employee models. †$p < .10$, *$p < .05$, **$p < .01$.

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Appendix: Survey Items

Sleep Quantity (Buysse et al., 1989)
The next set of questions will address your sleep health. The following two questions relate to your usual sleep habits **DURING THE PAST MONTH only**. Your answers should indicate the most accurate reply for the majority of days and nights in the past month.

1. During the past month, when have you usually gone to bed at night?
2. During the past month, when have you usually gotten up in the morning?

Response Options: Hour: 01-12, Minute: 00-59, AM/PM

Sleep Quality (PROMIS, 2016; Cella et al., 2010; Yu et al., 2012)
The next set of questions will ask about your sleep quality. To what extent did you experience the following in the **PAST 7 DAYS**?

1. My sleep was restless.
2. I was satisfied with my sleep.
3. My sleep was refreshing.
4. I had difficulty falling asleep.

Response Options: 1=Not at all, 2=A little bit, 3=Somewhat, 4=Quite a bit, 5=Very much

5. I had trouble staying asleep.
6. I had trouble sleeping.
7. I got enough sleep.

Response Options: 1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always

8. My sleep quality was…

Response Options: 1=Very poor, 2=Poor, 3=Fair, 4=Good, 5=Very good

Emotional Exhaustion (Shirom & Melamed, 2006)
Below are a number of statements that describe different feelings that you may feel at your full-time job in the Oregon National Guard. Please indicate how often, **IN THE PAST MONTH**, you have felt each of the following feelings:

1. I feel I am unable to be sensitive to the needs of coworkers.
2. I feel I am not capable of investing emotionally in coworkers.
3. I feel I am not capable of being sympathetic to co-workers.

Response Options: 1=Never or almost never, 2=, 3=Quite infrequently, 4=, 5=Quite frequently, 6=, 7=Always or almost always

General Supervisor Support (Yoon & Lim, 1999)
Still thinking about your primary full-time supervisor ([supervisor_name]) at your full-time job in the Oregon National Guard…

1. [supervisor_name] can be relied upon when things get tough on my job.
2. [supervisor_name] is willing to listen to my job-related problems.

3. [supervisor_name] really does not care about my well-being.

Response Options: 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Family-Supportive Supervisor Behavior (FSSB) (Leader Ratings) (Hammer et al., 2013)

The following section contains questions about your behaviors as a supervisor of full-time service members at the Oregon National Guard. Please read each statement carefully and rate the extent to which you agree with each statement based on the scale below.

1. I make my subordinates feel comfortable talking to me about their conflicts between work and non-work
2. I demonstrate effective behaviors in how to juggle work and non-work issues
3. I work effectively with my subordinates to creatively solve conflicts between work and non-work
4. I organize the work in my department or unit to jointly benefit employees and the company

Response Options: 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Family-Supportive Supervisor Behavior (FSSB) (Employee Ratings) (Hammer et al., 2013)

The following section contains questions about your experiences with your primary full-time supervisor ([supervisor_name]) for your full-time job at the Oregon National Guard. Please read each statement carefully and rate the extent to which you agree with each statement based on the scale below. This information you provide will be kept confidential. Your supervisor will *not* see your survey responses.

1. [supervisor_name] makes you feel comfortable talking to him/her about your conflicts between work and non-work.
2. [supervisor_name] demonstrates effective behaviors in how to juggle work and non-work issues.
3. [supervisor_name] works effectively with employees to creatively solve conflicts between work and non-work.
4. [supervisor_name] organizes the work in your department or unit to jointly benefit employees and the company.

Response Options: 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Sleep Leadership (Leader Ratings) (Gunia et al., 2015)

The following section contains questions about your behaviors as a supervisor of full-time service members at the Oregon National Guard. Please read each statement carefully and rate the extent to which you agree with each statement based on the scale below.

As a full-time supervisor in the Oregon National Guard...

1. I ask my subordinates about their sleeping habits.

2. I encourage my subordinates to get adequate sleep.
3. I consider sleep as an important planning factor.
4. I encourage my subordinates to nap if needed.
5. I encourage my subordinates to catch up on sleep before missions that require long hours.
6. I work to encourage my subordinates to have a good sleep environment (quiet, dark, not too hot or cold).
7. I discourage my subordinates from using caffeine or nicotine within several hours before trying to go to sleep.
8. I encourage my subordinates to try to go to sleep on time.

Response Options: 1=Never, 2=Seldom, 3=Sometimes, 4=Often, 5=Always

Sleep Leadership (Employee Ratings) (Gunia et al., 2015)

The following section also contains questions about your experiences with your primary full-time supervisor ([supervisor_name]) for your full-time job at the Oregon National Guard. Please read each statement carefully and rate the extent to which you agree with each statement based on the scale below. This information you provide will be kept confidential. Your supervisor will *not* see your survey responses.

1. [supervisor_name] asks subordinates about their sleeping habits.
2. [supervisor_name] encourages subordinates to get adequate sleep.
3. [supervisor_name] considers sleep as an important planning factor.
4. [supervisor_name] encourages subordinates to nap if needed.
5. [supervisor_name] encourages subordinates to catch up on sleep before missions that require long hours.
6. [supervisor_name] works to encourage subordinates to have a good sleep environment (quiet, dark, not too hot or cold).
7. [supervisor_name] discourages the use of caffeine or nicotine use within several hours before trying to go to sleep.
8. [supervisor_name] encourages subordinates to try to go to sleep on time.

Response Options: 1=Never, 2=Seldom, 3=Sometimes, 4=Often, 5=Always

Work Schedule (Control variable; Created for the study)

Which of the following best describes your work schedule for your full-time job at the Oregon National Guard? (Select all that apply)

1. Variable schedule, one that changes day to day
2. Regular daytime shift
3. Regular evening shift
4. Regular night shift
5. Rotating shift
6. Split shift
7. Other: please specify

Branch of Service (Control variable; Created for the study)
Response Options: Army, Air

Number of Children/Eldercare Responsibilities (Control variable; Created for the study)

1. How many children do you have?

Response Options: 0,1,2,3,4,5,6,7,8,9,10,11+

2. How many dependent children do you have living at home at least 3 days per week?

Response Options: 0,1,2,3,4,5,6,7,8,9,10,11+

3. Are any of these children [dependent, living at home at least 3 days a week] from a previous union [your own or your partner's, or both]?

Response Options: Yes, No

4. Do you have children living at home who have a developmental disability, physical health problem, or long-term serious mental health problem?

Response Options: Yes, No

5. Are you currently providing care for one or more elderly or adult dependents at least 3 hours per week? (Caregiving activities could include providing transportation, doing yard work, managing money, etc.)?

Response Options: Yes, No