CHAPTER 10

Sleep and Work Withdrawal

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SLEEP AND WORK WITHDRAWAL

Attendance at work and engagement once at work are normative expectations. Yet simple observation tells us that neither can be taken for granted. Instead, employees withdraw from work in a variety of different ways that can be costly for organizations (Hanisch & Hulin, 1991). From an academic perspective, the construct of work withdrawal has traditionally included those visible behaviors in which individuals are absent from work in some manner, including tardiness/lateness or full-day absenteeism, and in more extreme cases, turnover (Johns, 2001). More recently, however, the view of what constitutes work withdrawal has been broadened to include less visible forms of withdrawal behaviors, in which individuals attend work, but withdraw behaviorally or cognitively once at work (LeBlanc, Barling, & Turner, 2014). These less visible forms of withdrawal include intentionally neglectful behaviors and cognitive and emotional distraction. They are potentially even more costly to organizations than the visible withdrawal behaviors, precisely because they remain hidden and as a result are more difficult both to study and to manage

Given the importance of withdrawal from work for organizations, it should come as no surprise that there is a large body of research examining withdrawal behaviors. Most of this research has investigated the work-related factors such as work attitudes (e.g., Hanisch & Hulin, 1990, 1991; Laczo & Hanisch, 2000) that influence withdrawal behaviors, but previous research has also shown that nonwork factors in the form of family demands (Hammer, Bauer, & Grandey, 2003) and stressors (LeBlanc et al., 2014) also influence withdrawal behaviors at work. The focus of this chapter is to understand how a ubiquitous nonwork experience, *sleep*, affects work withdrawal behaviors.

To do so, we will briefly review work withdrawal behaviors. This is followed by a discussion of how different aspects of sleep might be implicated in different forms

of work withdrawal. Finally, we end with a look toward the future, and possible next steps in investigating the effects of sleep on work withdrawal.

WORK WITHDRAWAL

Work withdrawal comprises a group of behaviors and intentions that have traditionally been defined as "physical removal from a particular workplace either for part of a day, an entire day, or permanently" (Johns, 2001, p. 233). Consistent with this, researchers have tended to focus on tardiness/lateness, absenteeism, and turnover, all of which are visible, measurable behaviors (LeBlanc et al., 2014). There has been two general perspectives about the relationship between these visible withdrawal behaviors. One perspective views tardiness/lateness, absenteeism, and turnover as manifestations of an overall withdrawal from work construct, arguing that each behavior is a way in which employees withdraw from work in response to unfavorable work attitudes such as job dissatisfaction and lack of organizational commitment (e.g., Hanisch & Hulin, 1991; Rosse & Hulin, 1985). Based on this, it is thought that the understanding of the withdrawal behaviors and their antecedents would be advanced by focusing on aggregate measures that combine the withdrawal behaviors (Berry, Lelchook, & Clark, 2012).

In some of the first work to examine withdrawal behaviors as a general family of behavioral outcomes, Hanisch and Hulin (1990, 1991) divided *organizational withdrawal* into two components, namely work and job withdrawal (Hanisch & Hulin, 1990, 1991). Work withdrawal included behaviors that dissatisfied individuals would use to avoid aspects of their specific work role or minimize the time spent on their specific work tasks while maintaining their current organizational and work–role memberships; this included behaviors such as *unfavorable job behaviors, lateness, and absenteeism* (Hanisch & Hulin, 1991). Job withdrawal on the other hand was defined as employees' efforts to remove themselves from a specific organization and their work role, including behaviors such as *turnover intentions, desire to retire, and intended retirement age* (Hanisch & Hulin, 1991).

The second perspective views each of the withdrawal behaviors as unique and driven by specific antecedents, and therefore different from an overall withdrawal construct (e.g., Price & Mueller, 1981; Steers & Mowday, 1981). A recent meta-analysis provides support for this second view of withdrawal behaviors, as the corrected correlations between all three withdrawal variables were small (i.e., 0.26 between lateness and absenteeism, 0.25 between absenteeism and turnover, and 0.01 between lateness and turnover; Berry et al., 2012). These small-to-moderate intercorrelations provide no support for an overall withdrawal construct that combines lateness, absenteeism, and turnover. In addition, the progression of withdrawal model was supported, in which lateness predicts absenteeism, and in turn absenteeism predicts turnover (Berry et al., 2012; Koslowsky, Sagie, Krausz, & Singer, 1997). This progression model suggests that relatively mild withdrawal behaviors, such as occasional lateness, are important

predictors of more severe future withdrawal behaviors, such as frequent absenteeism or voluntary turnover.

Withdrawal *from* Work versus Withdrawal *at* Work

Recently, researchers (LeBlanc et al., 2014) have expanded the concept of withdrawal to include less visible behaviors, arguing that a comprehensive understanding of workplace withdrawal behavior must include situations in which individuals are at work, but are not working. LeBlanc et al. (2014) distinguished between two types of withdrawal behaviors: withdrawal *from* work, which are the more visible work withdrawal behaviors, and withdrawal *at* work, which includes the less visible work withdrawal behaviors.

Withdrawal *from* work is defined as "physical removal from a particular workplace either for part of a day, an entire day, or permanently" (Johns, 2001, p. 233), thereby including previously discussed visible withdrawal behaviors such as partial absenteeism, tardiness/lateness, and absenteeism. Partial absenteeism goes beyond tardiness (i.e., arriving late for work), and includes leaving work early and taking extended breaks during the workday (Barling, MacEwen, Kelloway, & Higginbottom, 1994). Intending to leave the organization permanently would also reflect withdrawal from work (LeBlanc et al., 2014).

In contrast, withdrawal *at* work is defined as being "physically at work but not productive" (LeBlanc et al., 2014, p. 401), and includes less visible withdrawal behaviors such as work neglect and cognitive and emotional distraction. Work neglect is more deliberate, and involves exerting less behavioral effort while at work (e.g., Schat & Kelloway, 2000) and can include behaviors such as cyberloafing, that is, the personal use of the Internet by employees while at work (Liberman, Seidman, McKenna, & Buffardi, 2011). Distractions are any environmental events or stimuli that challenge our ability to maintain focus on goal-relevant information. These distractions capture attention and reallocate processing resources, and thus can impair performance (Dolcos & McCarthy, 2006; Ellis & Ashbrook, 1988). In line with the progression model of work withdrawal, it is possible that these withdrawal *at* work behaviors are precursors of withdrawal *from* work behaviors (LeBlanc et al., 2014); however, it remains for future research to investigate this possibility.

As would be expected, most research on withdrawal behaviors have focused on those behaviors included in withdrawal from work (i.e., lateness, absenteeism, and turnover). In predicting and explaining these withdrawal behaviors, focus has generally been on a variety of personal (e.g., gender; Steel & Rentsch, 1995), attitudinal (e.g., job commitment; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002), and organizational variables (e.g., organizational support; Eisenberger, Fasolo, & Davis-LaMastro, 1990). Less is known about how nonwork variables impact work withdrawal behaviors, although there are exceptions to this, for example, work-related experiences such as work–family conflict (Hammer et al., 2003) or intimate partner aggression (LeBlanc et al., 2014) impact both withdrawal from and at work.

The Costs of Work Withdrawal

Individual acts of withdrawal are highly costly for most organizations (Hanisch & Hulin, 1991). Employee withdrawal impacts organizations in both financial and nonfinancial ways (Laczo & Hanisch, 2000). Although calculating the precise cost of withdrawal is hazardous at best, one estimate suggests that employee lateness costs U.S. businesses more than $3 billion each year (DeLonzor, 2005). The direct costs of absenteeism are estimated to range from 2% to 15% of the gross annual payroll, although it is difficult to differentiate between avoidable and unavoidable absence (Dabboussy & Uppal, 2012; Navarro & Bass, 2006). The cost of replacing employees has been estimated to be between 50% and 200% of those employees' first year salaries (Fitz-Enz, 1997; Hale, 1998). As well, it is estimated that turnover costs U.S. businesses billions of dollars per year (Rosch, 2001). In terms of withdrawal at work, work neglect in the form of cyberloafing can cost corporations up to $54 billion annually and can decrease employee productivity by as much as 40% (Conlin, 2000). Taken together, Sagie, Birati, and Tziner (2002) considered the costs of withdrawal at and from work behaviors to a leading, medium-sized Israeli company to be approximately 16.5% of the company's before-tax income.

Withdrawal also affects organizations in nonfinancial ways. For example, absenteeism is linked to increases in workplace injuries (Goodman & Garber, 1988) and decreases in teammates' morale and work motivation (e.g., Eder & Eisenberger, 2008; Koslowsky et al., 1997). Because of the presumed costs of withdrawal behaviors, organizations devote vast amounts of time, energy, and resources to preventing or alleviating negative effects of withdrawal behaviors, including programs that focus on work engagement, organizational commitment, and retention (e.g., Harter, Schmidt, & Hayes, 2002; Holtom, Mitchell, Lee, & Inderrieden, 2005; Meyer et al., 2002).

SLEEP

As we have already noted, work withdrawal behaviors are a function of both work and nonwork factors. Although most research has focused on the work-related predictors of work withdrawal (e.g., emotional labor; Scott & Barnes, 2011), research has also investigated the extent to which work withdrawal is influenced by important nonwork factors; in this respect, work–family conflict has been implicated as a key factor (e.g., Hammer et al., 2003). We now turn our attention to how sleep affects work withdrawal from work and withdrawal at work.

Most adults spend the majority of their time working (~7 hours/weekday, ~2 hours/weekend day; Basner et al., 2007) and sleeping (6.68 hours/night; Barnes, Wagner, & Ghumman, 2012). Despite this, sleep and work are incompatible bedfellows, as time spent working takes away from time spent asleep, and vice versa. Research suggests that the amount of sleep that full-time workers get has been decreasing over the past 30 years; at the same time, the number of working hours

has increased (Knutson, Van Cauter, Rathouz, DeLeire, & Lauderdale, 2010). Adding to that are findings that suggest that sleep problems are quite common in adults (Knutson et al., 2010; Mullins, Cortina, Drake, & Dalal, 2014). According to a 2008 survey examining sleep, at least 65% of people experience sleep problems at least a few nights a week (Swanson et al., 2011). Therefore sleep problems have the potential to influence organizational functioning in general, and withdrawal behaviors in particular. It is important to note that the term "sleep problems" as used here is a broad construct encompassing the many different ways in which sleep may be disturbed (see Chapter 2 by Cheng and Drake for a more complete discussion). Sleep problems include reductions in quantity or quality of sleep, circadian rhythms problems, and sleep disorders (Mullins et al., 2014; Roehrs, Carskadon, Dement, & Roth, 2011). Each of these sleep constructs is important in and of itself; however, the goal of this chapter is not to disentangle these sleep constructs and their outcomes.

One of the most common and disabling immediate consequences of sleep problems is *sleepiness* (e.g., Pack et al., 2006; Swanson et al., 2011), which is defined as "a craving or desire for sleep" (Dement & Carskadon, 1982, p. S57). Sleepiness reflects a universal physiological need state that is comparable to our physiological need states of hunger or thirst (Drake, 2011; Roehrs et al., 2011). Powerful physiological mechanisms regulate sleep, so that although people can thwart sleep and stay awake for a while, the control over sleep–wake patterns is limited, and prolonged periods of waking activity lead to sleepiness and will eventually lead to sleep (Barnes, 2012; Breslau, Roth, Rosenthal, & Andreski, 1997; Porkka-Heiskanen et al., 1997). Dinges (1995) suggests that sleepiness is one of the most important and common inhibitors of performance in our daily lives. Because individuals are often unaware of the impairments resulting from sleepiness, they assume they are not affected by it, or that they have control over it (Banks & Dinges, 2007; Mullins et al., 2014; Van Dongen, Maislin, Mullington, & Dinges, 2003). Sleepiness has many negative effects on work; for example, sleep loss and the resulting sleepiness have been shown across a number of studies to have effects on employee's lateness, absenteeism, health problems, accident rates, and performance (e.g., Carskadon et al., 1986; Drake et al., 2010; Newman et al., 2000; Spiegel, Leproult, & Van Cauter, 1999; Swanson et al., 2011; Wolk & Somers, 2007). Therefore, sleepiness potentially plays an important role in work withdraw behaviors, and this relationship will be outlined below.

SLEEP AND WORKPLACE WITHDRAWAL BEHAVIORS

To understand how sleep problems and sleepiness impact general work outcomes, Mullins and colleagues (2014) provided a comprehensive framework rooted in physiology that will be helpful in understanding how sleep impacts withdrawal behaviors specifically. The main tenet of their mediational model is that sleep problems (e.g., low levels of sleep quantity, low sleep quality, circadian rhythms, sleep disorders, or a central nervous system disorder) lead to sleepiness. Sleepiness then

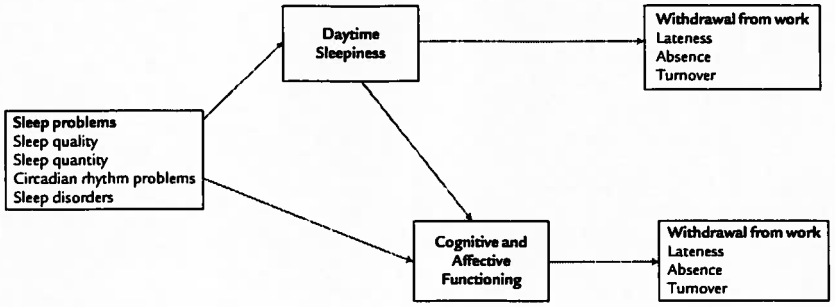

Figure 10.1.
Indirect paths from sleep problems to withdrawal from, and withdrawal at, work.

effects information processing and affect (i.e., psychological functioning), which in turn affect work-related behavioral outcomes. They also propose that sleepiness directly influences work-related outcomes (Mullins et al., 2014) (see Figure 10.1). This model will be especially useful for understanding how sleep problems, and sleepiness, differentially influence withdrawal from versus withdrawal at work. Specifically, we expect that daytime sleepiness will have a direct effect on withdrawal *from* work. In contrast, we expect that sleepiness will indirectly influence withdrawal *at* work through psychological functioning (i.e., information processing and affective pathways) (see Figure 10.1).

It is important to note here that this is a new framework for understanding the impact of sleep on work-related outcomes. Therefore it is unclear whether sleep problems necessarily always lead to sleepiness, which then impact organizational outcomes. Potentially, some sleep problems (i.e., low levels of sleep quantity, low sleep quality, circadian rhythms, sleep disorders, or a central nervous system disorder) might have a direct effect on organizational outcomes, indicating that sleep problems may be partially mediated through sleepiness. Much of the previous research has examined the direct effect of different sleep problems on organizational outcomes, without any consideration of the role played by sleepiness. More research is needed to further investigate this relationship. In the next section we examine the differential influence that sleep problems, and therefore sleepiness, have on withdrawal *from* versus withdrawal *at* work. As well, previous research on sleep and withdrawal behaviors will be reviewed.

Withdrawal from Work

Withdrawal from work involves physically removing yourself from work for at least some part of the day, through behaviors such as tardiness/lateness, absenteeism, arriving late, and leaving early (Barling et al., 1994; Johns, 2001), and in extreme cases, exiting the organization permanently. Sleepiness, caused by sleep problems, has the potential to directly impact individuals' withdrawal from work. Understanding the nature of sleepiness helps us understand why this is the case.

As previously stated, sleepiness reflects a physiological craving for sleep (Dement & Carskadon, 1982) and sleepiness results from a number of different sleep problems (e.g., low levels of sleep quantity, low sleep quality, circadian rhythms, sleep disorders, or a central nervous system disorder). How sleepy someone is can range from not sleepy at all and fully alert on one extreme, to a debilitating state known as excessive daytime sleepiness (Mullins et al., 2014). Although not all sleepiness is at the extreme levels, daytime sleepiness affects approximately 35% to 40% of the U.S. adult population (Drake et al., 2010; Hossain & Shapiro, 2002).

Sleepiness potentially impacts withdrawal from work in two specific ways. First, by definition sleepiness awakens the desire to sleep, and therefore reflects the desire to withdraw from whatever activities an individual is engaging in. In a work context, sleepiness is likely to make individuals withdraw *from* work. Specifically, sleepiness makes it difficult to wake up in the morning, which would impact work given that work is the first place most people go to upon awakening (Guglielmi, Jurado-Gámez, Gude, & Buela-Casal, 2014). As well, sleepiness progressively increases across the day, further increasing the desire to sleep and potentially the desire to withdrawal from work.

A second way in which sleep problems and sleepiness may impact withdrawal from work behaviors is through the negative impact that sleep has on health (e.g., Spiegel et al., 1999; Wolk & Somers, 2007). For example, sleep problems have been shown to influence many health-related outcomes such as obesity and metabolic disturbance (Spiegel et al., 1999; Wolk & Somers, 2007) as well as hypertension, heart disease, and cardiovascular mortality (Newman et al., 2000). Poor health makes work participation more challenging, and therefore influences withdrawal from work behaviors. In the next section, research examining the different withdrawal from work behaviors will be examined.

Partial Absenteeism

Hepburn and Barling (1996) defined partial absenteeism as officially being in attendance at work on a given day, but taken unauthorized time away from work during some part of the day (e.g., by arriving late, leaving early, or taking extended breaks). There is less research on partial absenteeism than there is on absenteeism or turnover, potentially because it harder to track than these other types of withdrawal behaviors. However, there is considerable research on how sleep impacts school-related behaviors of children and adolescents, with research demonstrating that sleep problems affect tardiness at school, among other important outcomes (Wahlstrom, 2002; Wolfson, Spaulding, Dandrow, & Baroni, 2007).

Research within the work domain also indicates that sleep problems impact partial absenteeism. In a survey study 29% of respondents reported having fallen asleep or become significantly drowsy at work, 12% were late to work as a result of sleepiness, and 4% left work early as a result of sleepiness and sleep problems (Swanson et al., 2011). In separate study, Kecklund, Åkerstedt, and Lowden (1997) examined morning work and its effects on sleep and alertness. They found that

early morning work was associated with more apprehension of difficulties in awakening and insufficient sleep. As is apparent, still more research needs to be conducted on sleep and partial absenteeism.

Absenteeism

In contrast to partial absence, absenteeism involves taking a full day away from work (and excludes reasons such as vacation, jury duty, or other authorized reasons). The relationship between sleep and absenteeism has attracted more research attention than other indicators of withdrawal from work behaviors. There are potentially two reasons for this. First, absenteeism is monitored by most organization and therefore data are readily available. Second, there is a clear relationship between sleep problems and physical health problems (e.g., Newman et al., 2000; Spiegel et al., 1999; Wolk & Somers, 2007), and physical health problems are a major cause of absence from work. For example, a large study conducted in the United Kingston examined the relationship between self-reported health status and sickness absence. This study demonstrated that there is a strong relationship between health measures and sickness absence from work, both in terms of short-term and long-term absences (Marmot, Feeney, Shipley, North, & Syme, 1995).

To begin the review of the literature on the relationship between sleep and absence, we first look at studies that have examined sleepiness specifically and there are a number of studies that have demonstrated this relationship. One study found that individuals who report more daytime sleepiness take more days off work for health reasons than do individuals who are not sleepy (Philip, Taillard, Niedhammer, Guilleminault, & Bioulac, 2001). Using a national sample in Sweden, Åkerstedt, Kecklund, Alfredsson, and Selen (2007) found that disturbed sleep and sleepiness/fatigue were both predictors of long-term sickness absence. Further evidence supporting the importance of sleepiness in predicting absence comes from research by Sivertsen and colleagues (2013). They examined the separate and combined effects of symptoms of insomnia and obstructive sleep apnea on long-term sick leave. Importantly, sleep apnea with no daytime sleepiness was not significantly associated with subsequent sick leave; in contrast, sleep apnea with symptoms of daytime sleepiness was strongly associated with sick leave (Sivertsen, Björnsdóttir, Øverland, Bjorvatn, & Salo, 2013).

Next we turn our attention to studies that have examined the relationship between sleep problems (e.g., disturbed sleep, sleep quality) and absenteeism that have not examined sleepiness. First, one study demonstrated that disturbed sleep is related to both long-term (90 days) and intermediate length (14–89 days) sickness leave (Åkerstedt et al., 2007). As well, Westerlund and colleagues (2008) found that self-reported sleep disturbances were associated with medically certified sickness absence from work. In another study examining poor sleep quality among Japanese white-collar employees, Doi, Minowa, and Tango (2003) found that poor sleepers were more likely to take sick leave, as well as more likely to suffer from poor physical and psychological health. Finally, in a separate study, participants

reporting mediocre or poor rather than good sleep were significantly more likely to report long-term work disability during the previous 12 months (Eriksen, Natvig, & Bruusgaard, 2001).

Last there have been a number of studies that have investigated a specific type of sleep problem, namely, sleep disorders (e.g., insomnia, sleep apnea) and their relationship to absence from work. For example, Sivertsen et al. (2008, 2013) across two studies that used a large national sample in Norway found that having symptoms of sleep disorders was a significant risk factors for subsequent sick leave and permanent work disability. In a separate study, Swanson et al (2011) demonstrated that absenteeism was more likely for participants who were at risk for a sleep disorder compared to respondent not at risk for any sleep disorder. Other studies have shown that individuals with a diagnosed sleep disorder (e.g., insomnia, sleep apnea) have increased sickness absence from work (e.g., Jansson, Alexanderson, Kecklund, & Åkerstedt, 2013; Lallukka et al., 2013, 2014; Sjösten et al., 2009). Lastly, Sjösten et al. (2009) found that individuals diagnosed with a sleep disorder had an increased risk for disability pension compared to controls. As demonstrated, there has been a considerable amount of research conducted on sleep and absenteeism, although it is worth noting that most of this research comes out of the sleep physiology literature.

Turnover

Turnover is the least understood sleep outcome of all the withdrawal from work behaviors. One study examined the impact of sleep-related impairments, including sleepiness, and perceived general health on intentions to leave an organization (Blau, 2011). Using a sample of Emergency Medical Services (EMS) employees Blau (2011) found that sleep-related impairments and perceived health each accounted for an additional 2% of the variance in intent to leave, beyond background and work-related variables. However, further research is needed to examine the relationship between sleepiness and turnover to determine the precise nature of the relationship.

Even in the absence of studies, the relationship between sleep problems, sleepiness, and turnover can still be discussed. Because turnover is partially determined by job attitudes and by other withdrawal actions such as absenteeism (Hom, 2011) it is possible that sleep problems and therefore sleepiness impact turnover indirectly. Research suggests that chronically sleepy individuals have more negative attitudes regarding their jobs (Barnes, 2012). For example, in a study of workers with insomnia, participants described lower work-related self-esteem, less satisfaction with their job, as well as less efficient functioning at work (Leger, Massuel, Metlaine, & the SISYPHE Study Group, 2006). As well, sleepiness is related to increased absenteeism, which predicts intentions to leave an organization (Berry et al., 2012; Koslowsky et al., 1997). As previously indicated, turnover has been viewed as the final link in a causal chain of withdrawal behaviors (i.e., from partial absence, to absence, and then turnover), which also suggests a potential indirect effect of sleep

problems, sleepiness, and turnover. However, in the absence of specific empirical studies, more research is needed to understand the relationship between sleep problems and turnover.

In conclusion, we suggest here that sleepiness would have a direct effect on withdrawal *from* work behaviors because sleepiness leads to the desire to sleep, and therefore reflects the desire to withdraw from activities in which individuals are engaged. In a work context, therefore, sleepiness would result in withdrawal from work. As well, sleep problems predict physical health, which itself is strongly associated with absenteeism. Lastly, sleepy individuals have poorer work-related attitudes, which leave people at risk for turnover. In the next section, we discuss the possible effects of sleepiness on withdrawal at work.

Withdrawal at Work

Irrespective of how much or how well people sleep, or how sleepy they feel, the simple fact is that most individuals do not have the luxury of physically absenting themselves from work whenever they want. Attendance is a formal requirement with sanctions and punishment for noncompliance, and implicit norms further make missing work very difficult. As a result, many individuals attend work suffering from sleepiness, and it is in this state that withdrawal *at* work becomes likely. Thus, unlike withdrawal *from* work, withdrawal *at* work occurs when people attend work, but are not productive because they are distracted and/or neglect their work responsibilities (LeBlanc et al., 2014).

As is the case for withdrawal *from* work, sleep problems and therefore sleepiness are also potential antecedents of withdrawal *at* work. However, unlike the direct effects of sleepiness on withdrawal *from* work, sleepiness has its effects on withdrawal *at* work indirectly, through the impact that sleepiness has on brain functioning (e.g., cognitive and affective). The effects of sleep problems and sleepiness on brain functioning are well documented in medical research on sleep (e.g., Harrison & Horne 2000). These impairments in cognitive and affect functioning (Mullins et al., 2014) are the mechanisms through which sleepiness may impact withdrawal *at* work behaviors. This relationship is further described below.

Studies have shown that sleep problems and sleepiness have consequences on affective and cognitive functioning, including self-control processes (e.g., Barnes, 2012; Breslau et al., 1997; Lim & Dinges 2010). Specifically, sleep loss lowers brain activity by affecting the hypometabolism of glucose (e.g., Thomas et al., 2000). The areas of the brain that experience the greatest reduction in brain activity from sleepiness are located in the prefrontal cortex, the superior temporal–inferior parietal cortices, and the thalamus (Mullins et al., 2014).

Physiologically, brain imaging studies of sleep-deprived participants show that the greatest decline in cerebral metabolic rate is in the prefrontal cortex (Schnyer, Zeithamova, & Williams, 2009; Wimmer, Hoffmann, Bonato, & Moffitt, 1992). This is crucial, as the prefrontal cortex controls higher order cognitive abilities, such as self-control, planning, foresight, and problem solving (Mesulam, 1985). Other

areas impacted by the hypometabolism of glucose caused by sleepiness include the superior temporal–inferior parietal cortices, which are responsible for higher order cognitive abilities such as semantic processing of auditory and visual information (Mesulam, 2000), and the thalamus, which controls the general arousal level (Mesulam, 2000).

This decrease in brain activity also affects the amygdala, the emotional center in the brain (Gujar, Yoo, Hu, & Walker, 2011). Sleep-deprived individuals experience a significant loss of functional connectivity between the amygdala and the prefrontal cortex, a region known to have strong regulatory effects on the amygdala (Sotres-Bayon, Bush, & LeDoux, 2004). As well, the decrease in metabolic activity also contributes to increased emotional activation of the amygdala following sleep deprivation (Gujar et al., 2011). Thus, sleepiness results in functional loss in areas of the brain that are responsible for higher order cognitive abilities (e.g., self-control) and in areas of the brain associated with arousal and emotions (Barnes, 2012; Mullins et al., 2014). As a result, the immediate psychological consequences of sleep loss are deficits in cognitive and affective functioning and importantly in the ability to regulate yourself.

Thus, sleep problems and sleepiness have domain-specific effects on the prefrontal cortex, which make cognitive functioning and importantly self-control as well as affective functioning vulnerable to specific failures that go beyond those expected to be caused by general low arousal (Harrison & Horne, 2000; Lim & Dinges, 2010). Therefore we suggest that individuals experiencing sleep problems and therefore sleepiness will withdraw at work. Specifically, these individuals will experience cognitive and emotional decrements at work, such as inadequate attention and increased distraction, that are beyond their control and they are also likely to experience self-control failures such as neglecting work.

Cognitive Distraction

Decreases in activation of the brain regions responsible for higher order cognitive abilities result in substantial deficits in information processing, particularly in processing speed, attention, learning, and memory, and the ability to regulate thoughts, emotions, and action (i.e., self-control) (Baumeister, 2002). Of interest here is the effects that sleep problems and sleepiness have on attention, or stated more negatively, daydreaming and/or distraction.

Previous research suggests that sleep deprivation has a negative effect on general attention (Wimmer et al., 1992) and on selective attention, with greater deficits experienced in early stages of cognitive processing (e.g., visual processing) than in the later stages of cognitive processing (e.g., response selection; Trujillo, Kornguth, & Schnyer, 2009). This can be manifested in different ways. For example, sleepiness decreases attentional capacity through a hyperreaction to novel stimuli (Gumenyuk et al., 2010) or through lapses in attention (Drake et al., 2001; Lim & Dinges, 2010). In terms of a hyperreaction to stimuli, Anderson and Horne (2006) demonstrated that sleepiness enhanced participant distraction

during the completion of a monotonous cognitive task. In terms of lapses in attention, a meta-analysis conducted by Lim and Dinges (2010) examined the effects of short-term sleep deprivation on cognitive variables, including simple and complex attention, processing speed, working memory, short-term memory, and reasoning and crystalized intelligence. They found that sleep deprivation produced significant differences in most cognitive domains; however, the largest effects were seen in tests of simple, sustained attention. Decreased attentional capabilities resulting from sleepiness therefore likely lead to cognitive distraction at work. There is some research within the work domain that supports the existence of this effect.

In a study examining commercial motor vehicle collisions, researchers showed that driver sleepiness and distraction significantly increased the severity of the incident, that is, the odds that the accident would be fatal (Bunn, Slavova, Struttmann, & Browning, 2005). Swanson et al. (2011) reported that individuals classified as at risk for sleep disorders were more likely to report cognitive impairments including difficulty with concentration. In a study of emergency physicians, researchers demonstrated that physicians were more susceptible to distractions at the end of their night shift, when they were most sleep deprived (Machi et al., 2012). Finally, a study examining the effects of reducing medical interns weekly work hours found that eliminating interns' extended work shifts (24 hours or more) in an intensive care unit significantly decreased attentional failures during night work hours (Lockley et al., 2004).

As these research findings suggests, sleep problems and sleepiness affect individuals' cognitive ability and attention, or stated more negatively, their susceptibility of distraction. Although much is known about the effects of sleep on cognitive functioning less is known about how sleep affects cognitive distraction at work specifically, leaving much room for further research in this area by organizational behavior researchers.

Affective Decrements and Emotional Distraction

Sleepiness also affects both the recognition and experience of emotions (Mullins et al., 2014). These effects have been attributed to a sleep deprivation-induced reduction in connectivity between the amygdala (the emotion center of the brain) and the prefrontal cortices, and the resulting reduction of inhibitory input to the amygdala (Chuah et al., 2010). For example, sleep-deprived individuals have more difficulty recognizing low to moderate expressions of happy and angry emotions than do their non-sleep-deprived counterparts (van der Helm, Gujar, & Walker, 2010). Sleep-deprived individuals are more easily distracted by negative emotional stimuli (Chuah et al., 2010) and are more likely to make choices associated with higher immediate emotional valence (Bayard et al., 2011). Importantly, these findings extend to the workplace: Individuals who were classified as at risk for a sleep disorders were more likely to report mood impairments including avoiding interactions with co-workers and boredom (Swanson et al., 2011).

Although we know from previous research that sleep problems and sleepiness impact emotions, there is little research on emotional distraction specifically (for an exception, see Chuah et al., 2010). Therefore there is an even greater need for research on the effects of sleep on emotional distraction at work (see Chapter 6 for a discussion on how sleep influences emotions in general).

Work Neglect

Work neglect is defined as exerting less behavioral effort while at work (e.g., Schat & Kelloway, 2003) or deliberately withholding effort at work (LeBlanc et al., 2014). In some respects, work neglect can be seen as a self-control failure, because self-control would normally enable employees to work even when they do not want to. Decreases in activation of the brain regions responsible for higher order cognitive abilities result in substantial deficits in all area of cognitive functioning. Importantly, sleep problems and sleepiness lead to decreases in their self-control (Baumeister, 2002).

There is a considerable body of research linking deactivation in the prefrontal cortex caused by sleep problems and sleepiness to subsequent deficits in vigilance (e.g., Åkerstedt, Peters, Anund, & Kecklund, 2005; Dean et al., 2010; Durmer & Dinges, 2005) and decreased motivation (e.g., Baranski, Cian, Esquievie, Pigeau, & Raphel, 1998). For example, findings from a study examining sleep motivation and academic performance showed that participants experiencing daytime sleepiness were more likely to procrastinate than well-rested students (Edens, 2006). A separate study examining college performance found that individuals with an eveningness preference reported lower self-control and greater procrastination (Digdon & Howell, 2008).

Research specifically within the work context suggests that sleepy individuals might neglect their work. One study documented an increase in cyberloafing in laboratory settings and in the workplace (Wagner, Barnes, Lim, & Ferris, 2012) as a result of lost and low-quality sleep. In addition, sleepiness has also been linked to a different indicator of neglectful work behavior, namely, social loafing. Specifically, sleepiness leads to an increase in social loafing in groups (Hoeksema-van Orden, Gaillard, & Buunk, 1998). Although these initial studies are interesting, additional research is required on the relationship between sleep and work neglect.

In conclusion, sleep problems and sleepiness affect withdrawal *at* work through the impact of sleepiness on brain functioning, including negatively affecting cognitive and affective functioning. Individuals experiencing sleep problems and sleepiness will experience cognitive and emotional decrements at work likely leading to inadequate attention and increased distraction, which result in self-control failures at work leading to neglect of their work duties.

NEXT STEPS

As indicated by many of the authors in this book, organizational researchers have only recently begin to examine the meaning of sleep in the workplace, and because

of this, much of this chapter is devoted to suggesting the potential for the relationship between sleep and work withdrawal. Clearly, there are many important potential avenues for this area of research in the future. In this next section, we briefly describe what we think might be a few of the most important areas in which this research could be further expanded.

First, we have offered a new way of understanding the nature of work withdrawal behaviors, specifically as withdrawal *from* and *at* work; however, more theory and research regarding this conceptualization are obviously needed, including how these different withdrawal behaviors are related to one another. Do they form a causal chain of withdrawal that starts with withdrawal at work, moves on to withdrawal from work (partial absenteeism and then absenteeism), and culminates in turnover? Previous research does suggest that lateness predicts absence and that absence predicts turnover in a causal chain (Berry et al., 2012), and this could be a fruitful area for theorizing and investigation.

Second, as the conceptualization of withdrawal at work behaviors is in its initial stages, it is possible that other behaviors are missing from the current definition. Specifically, we suggest that work neglect should be expanded to include behaviors that involve freely available technology, over and above cyberloafing (Wagner et al., 2012). As technology is continually changing and becoming more advanced, most people have smart phones and take them to work. To what extent does cyberloafing involve smart phones, and how much of this can be attributed to sleep quality, sleep quantity, or sleepiness? With technological advances pervading the workplace, it might well be necessary to understand how the known effects of sleep on withdrawal behaviors are manifest in new ways.

Third, one of the more interesting advances in research on absenteeism in the past few years has been the focus on presenteeism (e.g., Aronsson, Gustafsson, & Dallner, 2000). Whereas absenteeism involves staying away from work when there is no valid reason to do so, presenteeism involves attending work when we probably should not (Johns, 2010), for example, attending work because of explicit or implicit pressure even though the employee has an illness that could affect others. One question, for example, is whether attending work because of external pressures when we are too tired to do so might compromise safety and/or the quality of task and contextual performance?

A fourth area of further investigation is of course looking at the relationship between sleep problems, sleepiness, and turnover. One possibility is that this effect is indirect, but research could investigate whether sleep constitutes an additional nonwork predictor of turnover. Fifth, how might different sleep problems (e.g., reductions in quantity or quality of sleep, circadian rhythms problems, the presence of a central nervous system disorder, and sleep disorders such as apnea) impact different withdrawal behaviors? For the purposes of simplicity, much of the discussion in this chapter has considered sleep problems as a homogeneous condition, even though it is not. This may limit a more finite understanding of the effects of sleep on withdrawal behaviors. One possibility is that clinical sleep disorders affect extreme withdrawal behaviors (for example, more than subjective sleepiness) as they are less amenable to remediation. Pursuing this route would require

that we view the causes of organizational behaviors as occurring far outside the confines of a traditional organization.

Finally, we pose a question about the practical implications of research showing that in general, sleep affects withdrawal at and from work. Traditionally, management has been reluctant to engage in interventions outside of the workplace, lest it be seen as inappropriate interference in employees' private lives. This viewpoint is challenged, however, by an understanding that what happens in our private life, for example, the quality or quantity of sleep, has a significant effect on workplace behaviors. Acknowledging that the deep-seated reluctance to implement interventions outside of the workplace is unlikely to change soon, or easily, it would not be inappropriate for management to ensure in the short term that its own behaviors or expectations (such as being available on email at all hours) do not contribute to sleep problems in the first instance.

CONCLUSIONS

Workplace withdrawal behaviors have been the focus of research for decades, and a concern for management for even longer. The research that has been conducted has primarily searched for work-related factors that result in work withdrawal behaviors. It is clear, however, that nonwork factors, including sleep, also influence withdrawal behavior, and our chapter has extended our understanding of how nonwork factors, that is, sleep, play a significant role in workplace withdrawal. The relationship between sleep problems and withdrawal behaviors is in the early stages of research, and more research on this topic is certainly needed. This is an exciting area with tremendous potential for adding to our understanding of both the effects of sleep and of withdrawal at and from work.

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