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Sabotaging the Benefits of Our Own Human Capital: Work Unit Characteristics and Sleep

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The strategic human capital literature indicates the importance of human capital to work unit performance. However, we argue that human capital only aids performance when it is translated into actions beneficial to the unit. We examine a set of common human capital leveraging characteristics (including the use of extended shifts, night shifts, shift flexibility, norms for work as a priority over sleep, and norms for constant connectivity) as factors that enhance the effect of human capital on human capital utilization. We also draw from the 2-process model of sleep regulation to examine how these characteristics undermine employee sleep, and thus weaken the link between human capital and work unit performance efficiency. Overall, we propose that human capital leveraging strategies initially enhance the effect of human capital on work unit performance, but over time weaken the effect of human capital on work unit performance efficiency. Thus, strategies intended to enhance the beneficial effect of human capital on work unit performance can end up doing the opposite.

Keywords: human capital, strategic human resource management, sleep, organizational culture

It has become increasingly accepted that human capital is an important resource for organizations (Wright & McMahan, 2011). When leveraged effectively, human capital can serve as a potential resource to contribute to sustainable competitive advantage (Nyberg, Moliterno, Hale, & Lepak, 2014; Wright & McMahan, 2011; Wright, McMahan, & McWilliams, 1994). A recent meta-analysis provides general support for the potential value of human capital, indicating that unit-level human capital is associated with higher firm performance (Crook, Todd, Combs, Woehr, & Ketchen, 2011). However, the relationship is weaker than one might expect for a theory that describes what managers often describe as their "most important asset" (Fulmer & Ployhart, 2014, p. 162). Crook et al. found an overall corrected correlation between human capital and operational performance of .32, meaning human capital accounts for around 10% of the variance in operational performance (with even weaker effects on global measures of firm performance). Even assuming that this average effect is higher when accounting for moderators such as the specificity of the human capital (Crook et al., 2011), the interconnectedness of human capital resources (Ployhart, Van Iddekinge, & Mackenzie, 2011), and methodological issues (Crook et al., 2011), this still leaves considerable variability around the average effect. This leaves open the possibility that managers can shape the organizational context in a manner that would enhance the beneficial effect of their human capital.

One important assumption held implicitly by strategic human capital researchers is that human capital translates directly into actions that are beneficial for the firm. If employees have the knowledge, skills, abilities, and other characteristics (KSAOs) needed to succeed, it seems natural that their actions would be beneficial for the firm. However, some scholars have challenged this assumption by arguing that human capital only provides potential or a foundation of firm effectiveness but does not necessarily result in firm performance by itself (Wright & McMahan, 2011). We contend that work units can engage in human capital leveraging strategies (including the use of extended shifts, night shifts, shift flexibility, norms for work as a priority over sleep, and norms for connectivity) as a means of bringing more of their human capital to bear.

However, it is also possible that these characteristics may actually result in a weaker effect of human capital on performance due to being worn down or drained. A growing body of research clearly indicates that sleep is an important determinant of employee effectiveness (Barnes, 2012; Harrison & Horne, 2000; Lim & Dinges, 2010; Pilcher & Huffcutt, 1996). Drawing from this, lack of sleep or poor quality sleep may hinder the process of translating human capital into actions beneficial to performance. Although people typically think of sleep as driven solely by individual choices, we posit that work unit characteristics also influence sleep. Drawing from recent research examining sleep,

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we specifically discuss how these human capital leveraging characteristics influence employee sleep quantity and quality in a systematic manner.

Accordingly, the purpose of this paper is to extend the strategic human capital literature to take into account employee sleep as an important determinant of the degree to which human capital influences performance. We examine how human capital leveraging characteristics have beneficial effects on human capital utilization, which provides benefits to work unit performance that are immediately apparent. We additionally examine how these characteristics undermine employee sleep, which has a cumulatively negative effect on the degree to which human capital is translated into performance. Thus, what initially appears to enhance the return on human capital may over time undermine that return.

Human Capital Leveraging Strategies and Human Capital Utilization

In a recent theoretical article, Ployhart, Nyberg, Reilly, and Maltarich (2014) define human capital as "an individual's KSAOs that are relevant for achieving economic outcomes" (p. 376). They further distinguish between human capital and human capital resources by considering the latter as the subset of human capital that are accessible for a unit's purposes. This definition suggests that not all individual's KSAOs are valuable for organizations and only those that are accessible and relevant for unit-relevant purposes have the potential to contribute to unit performance. This logic also suggests that individual human capital only sets the basis for a work unit to pursue performance goals. The potential contribution to work unit performance cannot be fully realized unless it is utilized in an effective way. Consistent with this argument, we view the impact of individual-level human capital on work unit performance through two mediating processes (i.e., via unit-level human capital utilization and via work unit performance efficiency) and argue that human capital leveraging characteristics may play different roles to moderate these two processes.

We begin by looking at the beneficial effects of human capital leveraging strategies on human capital utilization. We define human capital utilization as the extent to which the KSAOs of a work unit are utilized for performance objectives. This definition emphasizes the actual use rather than the potential value of human capital. In particular, we focus on three work unit schedule characteristics (i.e., extended shifts, night shifts, and schedule flexibility) and two work unit culture characteristics (i.e., norms for prioritizing work over sleep and norms for constant connectivity) and theorize how these characteristics may affect the utilization of human capital.

Work Unit Schedule Characteristics

In order to alleviate staffing shortages or deal with high workload demands, extended work shifts have been commonly used in contemporary organizations. The apparent benefit of using this practice seems apparent to work units. By having employees work longer hours, work units can meet surges for demands without paying the salaries and benefits associated with hiring new employees. According to a recent poll of full-time U.S. workers (Gallup, 2014), the average work hours per week is 47, with nearly 40% of employees working at least 50 hr per week. Extended shifts enhance employees' motivation to exert their human capital at work. Employees may be motived to work longer hours in order to receive extra overtime pay. In addition, they may feel pressure to keep their jobs by conforming to the extended shifts requirement (Caruso, 2006). Work units that allow extended shifts may also stimulate employees' intrinsic motivation. Work is an important component of daily life (Leana & Feldman, 1992) and provides opportunities for people to achieve career success (Lee, MacDermid, & Buck, 2000). As evidence for this argument, Brett and Stroh (2003) found that managers who worked the longest hours were the most psychologically involved in their work. This finding suggests that employees may choose to use their KSAOs for longer hours for the sake of their careers when it is allowed by their work units.

Extended shifts also provide opportunities for individual employees to better use their KSAOs. Extended shifts may facilitate interaction and coordination among employees with better continuity of communication across shifts. Increased coordination may lead to knowledge sharing among employees and help synthesize KSAOs owned by different employees. For example, extended shifts have been widely used in health care settings (Caruso, Hitchcock, Dick, Russo, & Schmit, 2004) where effective coordination among doctors, nurses, physical therapists, social workers, and case managers is critical for the quality and efficiency of patient care (Gittell, Seidner, & Wimbush, 2010). Accordingly, we expect extended shifts to enhance the effect of individual human capital on work unit human capital utilization.

> *Proposition 1.* Work unit use of extended shifts will moderate the effect of work unit human capital on work unit human capital utilization, such that work unit use of extended shifts will enhance the effect of work unit human capital on work unit human capital utilization.

Many work units face demands for production during the night and day. For example, some call centers operate 24 hr per day, partly to meet customer demands at odd hours, and partly to serve customers who may live in different time zones. Manufacturing organizations may also operate 24 hr in order to avoid the high cost of shutting down the production process at the end of the day. One way to meet this demand is to use shiftwork. A common feature of various shiftwork systems is that work units can have different employees work at different times of the day without working any given employee 24 hr straight. Importantly, this is typically a unit-level property, in that rather than having a single employee work nontraditional shifts, the unit employs shiftwork in a manner that influences the whole unit.

Shiftwork—particularly night shifts—has been generally considered a negative work condition to most employees (Presser, 1999), but this practice may also have some positive effects on both employees and work units, which makes it likely for work units to maximize the utilization of human capital. Shiftwork serves as a useful tool for work units to use their members' human capital effectively. With night shifts, work units can obtain more return of their investment in their operational equipment. With reduced downtime, organizations are able to reduce the cost of capital per employee. Shiftwork can also help work units allocate enough employees to meet continuous production and service demands while allowing others to take enough time for recovery. Moreover, space or equipment constraints may limit the degree to

which a work unit can apply its human capital within a typical daytime shift, but opening the schedule to a broader variety of shifts allows more work time allocated toward projects. Additionally, when workflows must go through sequential steps or have dependence upon specific processes, restricting work hours can create bottlenecks that can be opened by using shiftwork. A familiar example is information technology employees usually work during the night time or holidays to perform upgrade or maintenance work. Work units may also be able to assign employees to their preferred times to work and schedule them accordingly to increase productivity. Given these reasons, we propose that

> *Proposition 2.* Work unit use of night shifts will moderate the effect of work unit human capital on work unit human capital utilization, such that work unit use of night shifts will enhance the effect of work unit human capital on work unit human capital utilization.

Because night work may cause health issues and disrupt people's family lives, many employees do not want to work night shifts. A commonly used solution to this difficulty is to rotate people among shifts. Compared with fixed shifts involving night work, rotating shifts have some benefits for both employees and work units, which may enhance the transformation of individual human capital into work unit human capital utilization. First of all, rotating shifts can help reduce the negative effects of night shifts on employees and thus make them more likely to devote their human capital to work. Rotating employee across shifts may also help reduce the injustice perceptions among employees and make the shiftwork less unattractive. Without such rotations, some employees (likely junior employees) would have to work night shifts for a prolonged period of time. This could make such employees feel unfairly treated, possibly reducing their contribution at work.

By using rotating shifts and other forms of scheduling that vary over time, work units can conveniently deploy employees to work when their skills are most needed. This may allow work units to rapidly match labor activities closely to production and service demands and thus enhance the extent of utilizing unit members' human capital (Berg, Appelbaum, Bailey, & Kalleberg, 2004). For example, a call center may find a growing proportion of customer calls occurring in the early evening hours. If schedules are fixed, it is difficult to apply the work unit's human capital to where it is needed. But if schedules are allowed to vary over time, human capital can be flexed and applied in the direction needed.

> *Proposition 3.* Work unit schedule flexibility will moderate the effect of work unit human capital on work unit human capital utilization, such that work unit schedule flexibility will enhance the effect of work unit human capital on work unit human capital utilization.

In addition to the three work schedule characteristics, we also consider two related culture characteristics that may influence work units' utilization of human capital, namely, norms for prioritizing work over sleep and norms for constant connectivity. Both characteristics require employees to spend long hours on work-related activities while scarifying their time for rest and personal life. Unit culture sets the basic assumptions about how a work unit arranges its work and manages its employees, and can thus determine the extent to which the unit uses the schedules that undermine sleep. Moreover, unit culture sends signals to employees regarding how they are expected to behavior in work units (Bowen & Ostroff, 2004; Schneider, Ehrhart, & Macey, 2013). When employees perceive that their work units encourage and reward them to sacrifice sleep for work, they are more likely to receive the signal and exert greater discretionary effort in terms of using their KSAOs for unit performance. This is consistent with research highlighting the tradeoff between time spent working and time spent on other activities such as sleeping (Barnes, Wagner, & Ghumman, 2012).

> *Proposition 4.* Work unit norms for prioritizing work over sleep will moderate the effect of work unit human capital on work unit human capital utilization, such that norms for prioritizing work over sleep will enhance the effect of work unit human capital on work unit human capital utilization.

Rapid change in technologies has enabled employees to work away from the traditional workplaces and take more control over the timing of work (Berg et al., 2004; Hahn & Dormann, 2013). Even though individual employees have some discretion to decide whether or not they switch off mentally from work after leaving their workplaces, work units can certainly determine whether they expect employees to stay connected with their work during off-job time. For example, work units requiring constant connectivity can give their employees company-paid smartphones or tablets to ensure they can deal with work matters outside the normal working hours; they can also contact unit members via e-mail or phones after work to continue the work that has been completed during the regular work hours.

Similar to the norms for prioritizing work over sleep, the norms for constant connectivity can also help work units to utilize employees' human capital more effectively. First, constant connectivity norms extend the time individual members spend on work matters and naturally enhance the use of employees' human capital for unit purposes. Second, keeping employees constantly connected with work enables work units to apply their human capital when and where it is needed, in a timely manner. For example, constant connectivity has been considered as crucial for financial trading companies due to the highly dynamic financial markets (World Finance, 2011). This allows traders to get access to work at any time, which can help them leverage investment and manage risks with great flexibility.

> *Proposition 5.* Work unit norms for constant connectivity will moderate the effect of work unit human capital on work unit human capital utilization, such that norms for constant connectivity will enhance the effect of work unit human capital on work unit human capital utilization.

Sleep and Human Capital

As noted by Barnes (2012), sleep quantity entails the amount of time an individual spends in a sleeping state, and sleep quality refers to difficulty falling asleep, staying asleep, and the number of awakenings experienced throughout the night. The two-process model of sleep (Borbély & Achermann, 1999) describes how sleep is regulated. The homeostatic process (Process S) drives an increasing propensity to sleep as time spent awake increases. The circadian process (Process C) refers to circadian changes in basal alertness, and is relatively independent from process S (Borbély & Achermann, 1999). Although Process S and Process C are largely independent, they have similar effects on sleep propensity and

other physiological outcomes (Babkoff, Caspy, Mikulincer, & Sing, 1991). Staying awake for prolonged periods has effects that are functionally the same as staying awake during periods of the day in which the circadian process is promoting sleep.

Similarly, sleep quantity and quality are separate constructs that have independent effects that work in the same direction. Perhaps because they can be driven by different phenomena, the relationship between sleep quantity and quality is weak (cf. Barnes, Schaubroeck, Huth, & Ghumman, 2011). Nevertheless, sleep quantity and quality have parallel additive effects (Barnes, 2012), such that either low sleep quantity or poor sleep quality can produce negative effects on employees (Hursh et al., 2004). For example, sleep deprivation and poor sleep quality both lead to low levels of self-control, high levels of unethical behavior, negative mood states, cyberloafing at work, performance (Barnes et al., 2011; Christian & Ellis, 2011; Hursh et al., 2004; Scott & Judge, 2006; Wagner et al., 2012). This is important because some organizational factors may restrict sleep quantity, whereas others may leave employees with sufficient time for sleep but undermine sleep quality. Although sleep researchers have not examined the effects of both sleep quantity and sleep quality on all possible outcomes, the similarity of these effects on the outcomes that have been examined mean that it is reasonable to expect similar effects on other outcomes as well.

Typically we think of sleep as a construct that resides solely at the individual level of analysis. Indeed, it does appear that employees make choices about the priorities in their lives, and allocate time to work, sleep, and family (Barnes et al., 2012). Moreover, the physiological mechanisms involved in sleep regulation lie at the individual level of analysis. However, this does not mean that the individual level of analysis is the only level that is relevant. We posit that work unit characteristics shape patterns of sleep for individual employees, with an effect that can emerge at the work unit level of analysis.

People within a given group have common exposure to factors that influence their sleep. This may include work demands that influence everyone in the work unit. For example, Bliese and Halverson (1996) conducted a study of soldiers across 99 units and found a large intraclass correlation coefficient (ICC1) value for their work hours. This indicates that time demands can be common across members of a given group in a manner in which there is consistency within a given unit in the number of hours worked. When combined with evidence presented by Barnes et al. (2012), that time spent working comes at the expense of time spent sleeping, such a unit-level effect on time spent working would help to create a unit-level effect on time spent sleeping. Moreover, some work environments may have other characteristics, such as stress or dynamic schedules that have a common effect across members of a given unit. Indeed, Hancock (2008) discusses sleep as a culturally negotiated practice, indicating that the sleep of an individual is, in part, determined by norms within the group the individual belongs to. In short, work unit cultures can vary in ways that create differences between work groups and similarities within workgroups in how much and how well the employees sleep.

Consistent with this idea, Barnes and Spreitzer (2015) discuss group level strategies to manage sleep as a strategic resource, including implementing sleep-friendly work schedules. Although in some cases, such policies may be enacted at the firm level, we contend that such policies will have the most variance at the work unit level. Accordingly, in the next section, we follow Hancock's (2008) suggestion to consider collective practices, and draw from the sleep literature to focus on work unit schedule characteristics as drivers of employee sleep.

Sleep and Performance Efficiency

Drawing from the two-process model (see Figure 1), Hursh et al. (2004) created and tested a mathematical model in which Processes S and C influence both sleep quantity and quality, which in turn influence task effectiveness. Their experimental data yielded very strong support for the model, accounting for approximately 90% of the variance in cognitive performance in two studies. A larger body of sleep physiology research as well as a new but growing literature in management indicates that this has important implications for a broad range of outcomes relevant to work. These include outcomes that are in the cognitive domain, affective domain, and behavioral domain. We discuss how this literature is relevant to the human capital domain (Barnes, 2012, and Mullins, Cortina, Drake, & Dalal, 2014, provide more detailed reviews of sleep and applied psychology).

Some of the clearest outcomes of sleep deprivation (i.e., low sleep quantity) and poor sleep quality are within the cognitive domain. Many of these outcomes are related to decrements in self-control. (Barber, Barnes, & Carlson, 2013; Barnes, Lucianetti, Bhave, & Christian, in press; Barnes et al., 2011; Christian & Ellis, 2011; Ghumman & Barnes, 2013). This manifests itself in important ways in organizations. A lack of sleep is linked to difficulty focusing and controlling attention (Chuah et al., 2010; Smith, McEvoy & Gevins, 2002), as well as maintaining high levels of alertness (Beaumont et al., 2001; Buysse et al., 2007). Thus, lack of sleep is linked to lapses in attention (Lim & Dinges, 2010). Sleep deprivation predicts unjustifiably high levels of risk in decision-making (Killgore, Balkin, & Wesensten, 2006; Killgore, Kamimori, & Balkin, 2011). Similarly, sleep deprivation leads to increased delay discounting (Reynolds & Schiffbauer, 2004), likely because people have a hard time resisting the impulse to take the short-term benefit.

Beyond a self-control framework, sleep is important for other cognitive processes. Memory consolidation occurs primarily during sleep, such that sleep deprivation hinders the process of learning and remembering (Walker & Stickgold, 2006). Lack of sleep leads to decrements in creativity, innovative thinking, and moral awareness (Barnes, Gunia, & Wagner, 2015; Harrison & Horne, 1999; Wagner, Gais, Haider, Verleger, & Born, 2004). Even small amounts of lost sleep lead to slower reaction times (Lim & Dinges, 2010).

Low sleep quantity and poor sleep quality also have important affective outcomes for employees. Actively regulating one's own affect requires self-control and effort (Grandey, 2003), which suffers when sleep quantity or quality is low. Moreover, sleep deprivation leads to exaggerated neural and behavioral activity to aversive experiences (Gujar, Yoo, Hu, & Walker, 2011; Yoo, Gujar, Hu, Jolesz, & Walker, 2007). As a result, sleep deprivation and poor quality sleep lead to high levels of hostility, low levels of joviality, high frustration, high levels of impatience, high anxiety, high paranoia, depression, low positive affect in general, and high negative affect in general (Caldwell, Caldwell, Brown, & Smith, 2004; Christian & Ellis, 2011; Kahn-Greene, Killgore, Kamimori,

Balkin, & Killgore, 2007; Kahn-Greene, Lipizzi, Conrad, Kamimori, & Killgore, 2006; Scott & Judge, 2006; Swanson et al., 2011). In part because of these effects on affect, lack of sleep and poor sleep quality lead to low trust (Anderson & Dickinson, 2010), low job satisfaction (Barnes, Ghumman, & Scott, 2013; Scott & Judge, 2006), and poor motivation (Baranski, Cian, Esquievie, Pigeau, & Raphel, 1998).

Sleep has important implications for employee behavior as well. In part, because of decrements in self-control, a lack of sleep and poor quality sleep lead to unethical behavior, cyberloafing, low levels of organizational citizenship behavior, low levels of work engagement, high levels of interpersonally inappropriate behavior, and high levels of social loafing (Barnes et al., 2013; Barnes et al., 2011; Christian & Ellis, 2011; Horne, 1993; Killgore et al., 2007; Lanaj, Johnson, & Barnes, 2014; Olsen, Pallesen, & Eid, 2010; Wagner, Barnes, Lim, & Ferris, 2012). More distally, these effects aggregate in a way that influences employee absenteeism as well. Sleep quantity and quality have been linked to workplace injuries and employee health (Barnes & Wagner, 2009; Daley, Morin, LeBlanc, Gregoire, & Savard, 2009), influencing the degree to which human capital can be applied.

This body of work shows clearly that when employees are sleep deprived or suffering low quality sleep, their effectiveness declines, not only as individuals (Mullins et al., 2014) but also in groups (Barnes & Hollenbeck, 2009). Although people may be able to increase their work quantity, it will come at the cost of less efficient performance that requires fixing more errors, takes longer times to find good solutions, and may require greater time spent in conflict resolution due to greater conflict among members. Belenky et al. (2003) highlight this empirically, showing how extending waketime cumulatively undermines performance. Indeed, in many settings the gain in quantity of work is more than offset by the loss in the quality.

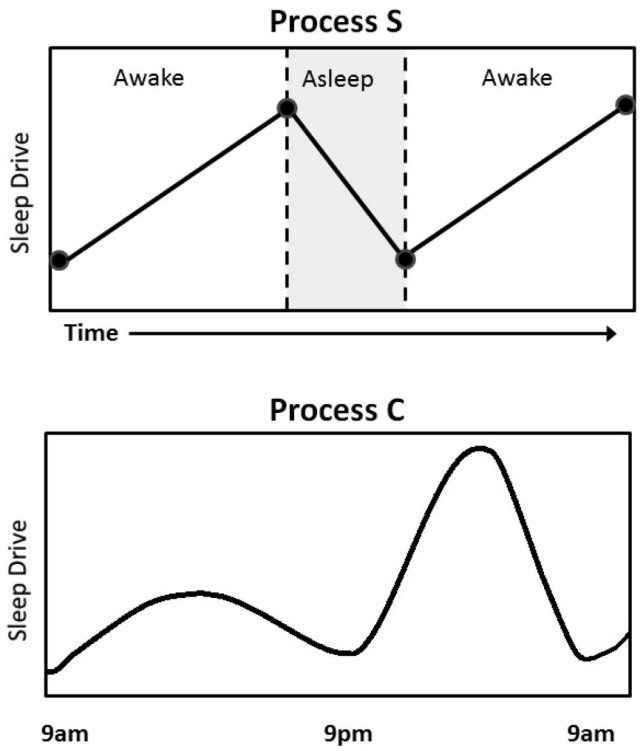

Figure 1. Two-process model of sleep.

Overall, this logic indicates that organizations may invested a tremendous amount of resources into their human capital, but these investments in human capital can be wasted when the employee does not actually translate the human capital investment into activity that is beneficial to the work unit. Accordingly, we propose the following:

> *Proposition 6.* Sleep (a) quantity and (b) quality moderate the effect of work unit human capital on work unit performance efficiency, such that low sleep quantity or poor sleep quality weaken the effect of human capital on performance efficiency.

Work Unit Schedule Characteristics

As discussed, work units often face workload demands that result in extended work shifts across the unit. Extended shifts of longer than 8 hr have important implications for both Processes S and C. Barnes et al. (2012) note that long work hours create a time scarcity issue, in that sleep hours are commonly traded for more work hours. Also due to time scarcity issues, long work hours often crowd out opportunities to engage in recovery activities that help people psychologically detach from work and lower their anxiety (Sonnentag, Binnewies, & Mojza, 2008; Sonnentag & Fritz, 2007; Sonnentag, Kuttler, & Fritz, 2010; Sonnentag, Mojza, Demerouti, & Bakker, 2012). This is key because anxiety is linked to poor sleep quality (Wagner, Barnes, & Scott, 2014). More directly, recovery activities have been linked with sleep quality (Sonnentag & Fritz, 2007). Thus, when employees are working hours that are long enough that they crowd out recovery activities, this will harm not only sleep quantity but also sleep quality.

Extended work shifts that entail long work hours are also disruptive to Process C. Long work hours often extend into times of day that are especially well-suited for sleeping. Not only does this mean that employees will be sleepy while trying to work, but also that such employees seeking to get a full night of sleep will then have to try to sleep during hours in which they are physiologically better suited for waking activity. For example, an employee working until 2 a.m. may wish to still obtain 8 hr of sleep by sleeping in the next morning. However, for most people, there is a period around 8:30–10:00 a.m. in which the employee will struggle to sleep even when sleep deprived. Similarly, an employee getting up extra early in order to squeeze in more work hours may try to still get 8 hr of sleep by going to bed extra early. But as noted, there is a dip in propensity to sleep referred to by Lavie (1986, 2001) as the "forbidden zone" that often makes it difficult to fall asleep early, even when sleep deprived.

Consistent with logic, empirical research shows that extended work shifts hinder both sleep quantity and quality. Barnes et al. (2012) found that time spent working was negatively related to time spent sleeping, but not the other way around. Åkerstedtt, Knutsson, et al. (2002) examined 5,720 employees in Stockholm, Sweden, and found that overtime was associated with poor sleep quality. Åkerstedtt, Fredlund, Gillberg, and Jansson (2002) examined a large sample from Statistics Sweden, and found that working over 50 hr per week was associated with poor sleep quality. For these reasons, we expect that extended work shifts will negatively influence both sleep quantity and quality.

Proposition 7. Work unit use of extended work shifts will negatively influence (a) sleep quantity and (b) sleep quality.

As noted in Proposition 6, sleep quantity and quality of will moderate the effect of human capital on performance. An integration of Propositions 6 and 7 reveals that because work unit use of extended work shifts will harm sleep quantity and quality, work unit use of extended work shifts will undermine the effect of human capital on performance efficiency.

Proposition 8. Work unit use of extended work shifts will moderate the effect of work unit human capital on work unit performance efficiency, such that the use of extended work shifts will attenuate the relationship between human capital and performance efficiency.

In a representative national sample of over 58,000 Swedish residents, Åkerstedtt, Fredlund, et al. (2002) found that over 23% of employees had a shiftwork schedule, with almost 4% of all employees having a night work schedule. It is important to note that although a shiftwork schedule may initially look like an individual level phenomenon, if one zooms out, this likely manifests as a work unit level phenomenon. Rather than one individual working a shiftwork schedule entailing nightshifts while everyone else in the unit has a more typical work schedule, it is more likely that some work units have production or service demands that entail having a schedule that includes shiftwork across many employees.

Sleep physiology researchers have devoted a considerable amount of attention to what time of day people work. Process C is most applicable to this topic. Humans have evolved to be better suited for waking activity during daylight and sleeping activity during darkness (Siegel, 2005). Melatonin is a biochemical that is heavily involved in the circadian process, such that when melatonin production goes up, sleep propensity increases (Lavie, 1986, 1997, 2001). Exposure to light suppresses the production of melatonin (Lavie, 2001). Blue light in particular plays a strong role in suppressing melatonin (Brainard et al., 2001). Thus, exposure to daylight lowers immediate sleep propensity, shifting the circadian phase in a forward direction. This is problematic for employees working night shifts. Such employees must attempt to work at night, when Process C leaves them sleepy, and sleep during the day, when it is difficult to sleep.

Consistent with this theoretical grounding, sleep researchers have found clear effects of shiftwork—specifically night shifts—on sleep. Large-scale studies reveal that night work is associated with shorter sleep duration and poor sleep quality (Åkerstedtt, Fredlund, et al., 2002; Ohayon, Smolensky, & Roth, 2010). In an examination of causality, Åkerstedtt, Nordin, Alfredsson, Westerholm, and Kecklund (2010) studied over 3,500 employees over a 5-year period. Åkerstedtt and colleagues found that moving from a normal schedule to working nights lead to an increase in difficulties falling asleep, and moving from night work back to typical day schedule eventually reversed this effect.

Proposition 9. Work unit use of night work shifts will negatively influence employee (a) sleep quantity and (b) sleep quality.

As noted in Proposition 6, sleep quantity and quality of will moderate the effect of human capital on performance efficiency. An integration of Propositions 6 and 9 reveals that because work unit use of extended night shifts will harm sleep quantity and quality, work unit use of extended work shifts will undermine the effect of human capital on performance efficiency.

Proposition 10. Work unit use of night shifts will moderate the effect of work unit human capital on work unit performance efficiency, such that the use of night shifts will attenuate the relationship between human capital and performance efficiency.

Shift rotations are often used to solve difficulty caused by night shifts, and other forms of shift flexibility can be used to match stocks of human capital with various dynamic demands faced by the work unit. Frequency of shift changes varies across work units; in a rapid rotation, an employee may rotate through all three shifts (or more) within a 1-week period, whereas in slower rotations employees may stay in a given shift for multiple weeks. Although rotating employees among shifts shares the burden of night shifts across multiple employees rather than concentrating it on a subset, it creates a different (potentially worse) problem with Process C. As noted by Czeisler et al. (1999) and Lavie (2001), Process C is remarkably stable. Thus, every shift change resets the process of adapting circadian rhythms to activity schedules, such that employees shifting to a different schedule suffer periods of time in which they must be awake and struggle to do so, as well as periods of time in which they try to sleep but must do so against the influence of their own circadian process. For example, an employee moving from an evening shift—in which she may sleep during relatively normal night hours—to a night shift—in which she must attempt to sleep during the day or early evening—may be exhausted after working the night shift but unable to fall asleep at 10 a.m.

Typical rotations involve moving a shift by 8 hr. This takes somewhere around 8 days to adapt to (cf. Aschoff, Hoffmann, Pohl, & Wever, 1975), during which time the employees will have sleep difficulties associated with Process C that lower both sleep quantity and quality. In especially problematic scenarios, employees shift their schedules every week, meaning their circadian processes are never in alignment with their schedules. In the most extreme contexts, shift changes may occur in a sporadic and unpredictable manner. Emergency rooms are an example of such a context. An emergency room may have a sudden increase in the number of patients needing immediate treatment, either because of random variation in patient distribution or because of disasters that may overwhelm momentary manpower levels. A common response is to bring in employees who are "on call," disrupting their sleep schedules. These other forms of work schedule changes are disruptive to sleep in a manner similar to rotating shifts.

Consistent with this reasoning from the two-process model, empirical research indicates that rotating shifts lead to negative effects on employee sleep. Gold et al. (1992) conducted a study of 635 Massachusetts nurses. In contrast to those working stable schedules, employees with rotating schedules had more difficulties sleeping. Indeed, based on a representative community-based sample, Drake, Roehrs, Richardson, Walsh, and Roth (2004) estimate that 10% of the rotating shift work population experience shift work sleep disorder, with significant decrements to both sleep quantity and quality. The same Process C logic applies to other forms of schedule instability, and for the same reasons. Schedule instability undermines both sleep quantity and sleep quality.

Proposition 11. Work unit work schedule instability will negatively influence (a) sleep quantity and (b) sleep quality.

As noted in Proposition 6, sleep quantity and quality will moderate the effect of human capital on performance efficiency. An integration of Propositions 6 and 11 reveals that because unit manpower schedule instability will harm sleep quantity and quality, it will undermine the effect of human capital on performance efficiency.

Proposition 12. Unit work schedule instability will moderate the effect of work unit human capital on work unit performance efficiency, such that unit work schedule instability will attenuate the relationship between human capital and performance efficiency.

Culture Characteristics

Schein (2010) notes that culture originates with leaders. Leaders communicate expectations and norms with both their various communication media as well as their own behavior. Barnes (2011) notes that different leaders take different approaches in how they publicly discuss the priority of sleep. By shaping the culture of the work unit in this direction, such leaders will set norms for employees to prioritize long work hours that come at the expense of sleep. By influencing subordinates to trade away sleep time for more work time, such organizational cultures harm Process S. On the other end of the spectrum, leaders can highlight a very different message regarding the priority of work and sleep. Rather than seen as someone who makes sure to get close to 8 hr of sleep per night as having a weak work ethic, work unit leaders can communicate clearly that making sure to get close to 8 hr of sleep per night is a wise way to enhance one's effectiveness.

Although most sleep occurs outside of a workplace, an example of sleep that occurs in the workplace is napping at work. In some work units, napping at work is depicted as time theft, which is considered an unethical behavior (Henle, Reeve, & Pitts, 2010). Not only is it considered a poor work ethic to sleep instead of work, but doing it at the workplace is considered an especially flagrant violation of norms. In work units with the strongest norms for prioritizing sleep, naps at work may not only be tolerated but actively encouraged. In some contexts, work units will have access to nap rooms. Nap rooms provide evidence that the work unit encourages employees to sleep well in order to work well, and that a nap at work is one way for this to occur.

We contend that in work units having a culture which creates norms for deprioritizing sleep in order to work more, employees will tend to sleep less. In contrast, organizations that have a culture which creates norms for maintaining sleep as a priority even at the expense of not working extended hours, employees will tend to sleep more.

Proposition 13. Work unit norms for prioritizing work over sleep will negatively influence (a) sleep quantity and (b) sleep quality.

As noted in Proposition 6, sleep quantity and quality will moderate the effect of human capital on performance efficiency. An integration of Propositions 6 and 13 reveals that work units with norms deprioritizing sleep will harm employee sleep quantity and quality, such that these norms will undermine the effect of human capital on performance efficiency.

Proposition 14. Work unit norms for the priority of sleep will moderate the effect of work unit human capital on work unit performance efficiency, such that norms prioritizing work over sleep will attenuate the relationship between human capital and performance efficiency.

Recent research has examined the role of norms for connectivity on employee sleep. 21st century technology enables many employees to engage in work when outside of the workplace such that employees can check e-mail, interact with customers or suppliers, or respond to short-deadline work tasks. Importantly, these activities may occur at any time of day. Many people sleep within reach of their smartphones in order to be immediately responsive to work demands that may occur at any time of day (Perlow, 2012). As Perlow (2012) notes, this often reflects a local culture that includes very strong norms for constant connectivity. In work units with strong cultural norms for connectivity, supervisors send e-mails that they expect immediate responses to, regardless of time of day. Peers may do the same, driven by a culture where responding to work demands is considered both normal and appropriate, and waiting even a few hours to respond is considered poor form.

Strong norms for constant connectivity can create problems for both Process S and Process C. Responding to work hours at all times of day can increase the amount of time employees spend working, and research indicates that high levels of time spent working can crowd out time spent sleeping (Barnes et al., 2012). Process C is disrupted as well. However, melatonin is disrupted by exposure to light (Lavie, 2001), especially blue light (Brainard et al., 2001). Electronic devices that employees must use to stay electronically connected to work expose employees to light, with blue light being prevalent. Indeed, Wood, Rea, Plitnick, and Figueiro (2013) found that self-luminous tablets inhibited melatonin. Furthermore, research indicates that the use of communication technology at home for work in the evening hinders the process of psychological detachment from work (Derks, van Mierlo, & Schmitz, 2014; Park, Fritz, & Jex, 2011), and sleep quality suffers when employees are unable to psychological detach from work (Sonnentag & Fritz, 2007).

Consistent with these ideas, Lanaj et al. (2014) found that smartphone usage late at night negatively influenced sleep quantity, and Munezawa et al. (2011) found that the use of mobile phones late at night negatively influences sleep quality. Similarly, Barber and Santuzzi (2015) found that telepressure, which they define as pressure to read and respond quickly to messages from clients, was associated with poor quality sleep. Thus, we propose that organizations with strong norms for constant connectivity will negatively influence the sleep quantity and quality of their employees.

Proposition 15. Work unit norms promoting constant connectivity to work will negatively influence (a) sleep quantity and (b) sleep quality.

As noted in Proposition 6, sleep quantity and quality will moderate the effect of human capital on performance efficiency. An integration of Propositions 6 and 15 reveals that work units with norms promoting constant connectivity to work will harm sleep quantity and quality, and because of this such norms will undermine the effect of human capital on performance efficiency.

Proposition 16. Work unit norms promoting constant connectivity to work will moderate the effect of work unit human capital on work unit

performance efficiency, such that norms promoting constant connectivity to work will attenuate the relationship between human capital and performance efficiency.

The Role of Time

Our propositions highlight how human capital leveraging strategies have some beneficial effects. They may strengthen the effect of human capital on human capital utilization, thereby aiding the more distal outcome of work unit performance. They may also have some detrimental effects in which they weaken the effect of human capital on performance efficiency, thereby undermining the more distal outcome of work unit performance. Whereas it may be tempting to assume that these beneficial and detrimental effects will cancel each other out, we propose that these effects will vary over time in a manner that shapes the overall relationship between these strategies and work unit performance.

The enhancing effect of human capital leveraging strategies on human capital utilization should manifest immediately. Once employees within a work unit are working long hours, or covering a greater portion of the 24-hr clock, or flexing their hours to match the demands of the work unit, the human capital utilization of that work unit will increase. This does not require any sort of accumulation to occur. Thus, the benefits to human capital utilization should be clear and immediate, with downstream benefits to work unit performance.

However, this will not likely be the case with regards to the effects on employee sleep and performance. As noted by the sleep, activity, fatigue, and task effectiveness (or SAFTE) model (Hursh et al., 2004), the effects of sleep deprivation and poor quality sleep accumulate over time. Individuals build up what sleep physiology researchers refer to as "sleep debt" (cf. Rupp, Wesensten, & Balkin, 2010; Rupp, Wesensten, Bliese, & Balkin, 2009), which is accumulated over prolonged periods of time and discharged through sleep. This is due to the fact that the restoration process that occurs during sleep is cut short by sleep deprivation and hindered during low-quality sleep, leaving the person in worse shape with each subsequent night.

Empirical research is consistent with the view of sleep debt accumulation over time producing negative effects that accumulate. Haavisto et al. (2010) conducted a laboratory experiment in which research participants were restricted to 4 hr of sleep for 5 nights. Haavisto and colleagues found that multitasking performance progressively deteriorated further each night. This is consistent with the idea that such participants are less and less able to bring their human capital to bear on the task. Elmenhorst et al. (2009) followed the same protocol of 4 consecutive nights of 5 hr of participants sleep per night and found that performance decrements in a cognitive task were equivalent to those produced by a blood alcohol content of .06%. Belenky et al. (2003) conducted a laboratory experiment following a similar protocol over the course of 7 days and found the same accumulating negative effect on cognitive performance. Van Dongen, Maislin, Mullington, and Dinges (2003) conducted a more prolonged version of the experiment, restricting sleep of participants to 6 hr of sleep per night for 14 consecutive days. The performance decrements they found from this protocol were equivalent to 2 nights of total sleep deprivation.

Rather than an endlessly downward spiral, this research indicates that the effect will tend to eventually stabilize. Belenky et al. (2003) found that the effects of accumulated sleep deprivation eventually leveled off at a lower overall level of performance. They speculate that human brains may have some ability to adapt to chronic sleep loss, albeit at a lower level of functioning. Moreover, accumulated sleep debt increases propensity to fall asleep as well as sleep quality, placing boundaries around the rate at which employees can build sleep debt. However, although this equilibrium is desirable in that it prevents an infinite erosion of the effect of human capital on performance, the final state is still one with a greatly eroded effect of human capital on performance. Indeed, as Elmenhorst et al. (2009) find, even a short period of sleep debt accumulation entailed by 4 consecutive nights of 5 hr of sleep produced a result nearly as harmful to performance as being legally too drunk to drive, and other studies find that the equilibrium period at which stability tends to occur is further down the performance-loss slope than a single work week.

Examining these differential effects over time, we posit that human capital leveraging strategies produce an initial enhancing effect on human capital utilization that is beneficial to work unit performance. However, although this effect is stable over time, the opposing harmful effect accumulates to become more negative. As human capital leveraging strategies produce chronic sleep loss problems, over time they erode the link between human capital and individual performance in a way that is harmful to work unit performance, eventually leveling off at an undesirably harmful state. In short, these strategies are initially attractive to work units because of the initial benefit, but this belies the longer term detriment that occurs from the accumulation of sleep-debt-based erosion of the effect of human capital on individual performance, producing aggregated effects at the work unit level.

Proposition 17. The total effect of human capital leveraging strategies on work unit human capital utilization strategies on work unit performance will be moderated by time, such that initially these strategies will have beneficial effects on work unit performance, but this relationship will become increasingly negative over time until reaching a stable detrimental effect.

Moreover, this has implications for work units that may change over time. Sleep physiology research indicates that chronic sleep deprivation induces relatively long-term, slow-recovering changes in brain physiology that affect alertness and performance (Johnson et al., 2004). For example, obstructive sleep apnea is associated with changes in white matter structures in the brain (Macey et al., 2008) as well as the volume of gray matter in several regions of the brain (Canessa et al., 2011), and sleep deprivation influences methylation levels in the frontal cortex (Ventskovska, Porkka-Heiskanen, & Karpova, 2015). This may be why over long periods of time, people can adapt to chronic sleep deprivation—albeit at lower levels of performance (Belenky et al., 2003).

This is relevant when work units change their human capital leveraging strategies. The timing of the effects from changing will depend on the history of the work unit. Consistent with research indicating that chronic sleep deprivation induces relatively long-term, slow-recovering changes in brain physiology (Johnson et al., 2004), sleep researchers have found that if people are chronically sleep deprived people and acutely sleep deprived people respond differently to recovery sleep. Rupp and colleagues (Rupp, Wesen-

Table 1
Propositions

1. Work unit use of extended shifts will moderate the effect of work unit human capital on work unit human capital utilization, such that work unit use of extended shifts will enhance the effect of work unit human capital on work unit human capital utilization.
2. Work unit use of night shifts will moderate the effect of work unit human capital on work unit human capital utilization, such that work unit use of night shifts will enhance the effect of work unit human capital on work unit human capital utilization.
3. Work unit schedule flexibility will moderate the effect of work unit human capital on work unit human capital utilization, such that work unit schedule flexibility will enhance the effect of work unit human capital on work unit human capital utilization.
4. Work unit norms for prioritizing work over sleep will moderate the effect of work unit human capital on work unit human capital utilization, such that norms for prioritizing work over sleep will enhance the effect of work unit human capital on work unit human capital utilization.
5. Work unit norms for constant connectivity will moderate the effect of work unit human capital on work unit human capital utilization, such that norms for constant connectivity will enhance the effect of work unit human capital on work unit human capital utilization.
6. Sleep (a) quantity and (b) quality moderate the effect of work unit human capital on work unit performance efficiency, such that low sleep quantity or poor sleep quality weaken the effect of human capital on performance efficiency.
7. Work unit use of extended work shifts will negatively influence (a) sleep quantity and (b) sleep quality.
8. Work unit use of extended work shifts will moderate the effect of work unit human capital on work unit performance efficiency, such that the use of extended work shifts will attenuate the relationship between human capital and performance efficiency.
9. Work unit use of night work shifts will negatively influence employee (a) sleep quantity and (b) sleep quality.
10. Work unit use of night shifts will moderate the effect of work unit human capital on work unit performance efficiency, such that the use of night shifts will attenuate the relationship between human capital and performance efficiency.
11. Work unit work schedule instability will negatively influence (a) sleep quantity and (b) sleep quality.
12. Unit work schedule instability will moderate the effect of work unit human capital on work unit performance efficiency, such that unit work schedule instability will attenuate the relationship between human capital and performance efficiency.
13. Work unit norms for prioritizing work over sleep will negatively influence (a) sleep quantity and (b) sleep quality.
14. Work unit norms for the priority of sleep will moderate the effect of work unit human capital on work unit performance efficiency, such that norms prioritizing work over sleep will attenuate the relationship between human capital and performance efficiency.
15. Work unit norms promoting constant connectivity to work will negatively influence (a) sleep quantity and (b) sleep quality.
16. Work unit norms promoting constant connectivity to work will moderate the effect of work unit human capital on work unit performance efficiency, such that norms promoting constant connectivity to work will attenuate the relationship between human capital and performance efficiency.
17. The total effect of human capital leveraging strategies on work unit human capital utilization strategies on work unit performance will be moderated by time, such that initially these strategies will have beneficial effects on work unit performance, but this relationship will become increasingly negative over time until reaching a stable detrimental effect.
18. The effects of changing human capital leveraging strategies on work unit performance efficiency will be moderated by time; the effects of change will be slower for units that have had their current leveraging strategies for a longer period of time.

sten, & Balkin, 2010; Rupp, Wesensten, Bliese, et al., 2009), found that those who are chronically sleep deprived take longer than those who are not to recover from acute sleep deprivation. In other words, if an employee has a night of sleep deprivation, a recovery night or two is typically enough to make up the majority of the difference and restore the employee's performance. But if that employee already has a big sleep debt built up from chronic sleep deprivation, it takes a much longer period of time with full nights of sleep to return to a fully rested state.

Thus, the period of time that a work unit has worked under a given set of human capital leveraging strategies can play a role in outcomes from changing those strategies. If a work unit changes from high levels of human capital leveraging strategies to low levels, this moves in a direction that will be help sleep and entail the performance efficiency gains discussed above. However, how rapidly these gains occur will depend on how long the work unit utilized high levels of human capital leveraging strategies. If the unit has long used high-leveraging strategies, the employees will be chronically sleep deprived and thus slow to gain the benefit of switching to a low-leveraging strategy (as the work units slow discharge their sleep debt). In contrast, for units that have not long used high-leveraging strategies, it takes a lesser amount of time to gain the benefits of switching to a low-leveraging strategy. For units moving in the other direction, from low- to high-leveraging strategies, the logic is analogous. Those that have long been in low-leverage strategies have less sleep debt than those that have a shorter time in such strategies (and thus a previous history of working under high-leverage strategies that may have left some persistent sleep debt), delaying the harmful effects of switching to high-leveraging strategies.

> *Proposition 18.* The effects of changing human capital leveraging strategies on work unit performance efficiency will be moderated by time; the effects of change will be slower for units that have had their current leveraging strategies for a longer period of time.

Discussion

The purpose of this paper has been to extend the strategic human capital literature to include the beneficial and detrimental effects of human capital leveraging strategies, with an emphasis on the role of sleep (see Table 1). We discussed how these strategies can enhance human capital utilization, with short-term beneficial enhancements to the effect of human capital on work unit performance, and how they can undermine employee sleep in a manner that has increasingly harmful effects on the relationship between human capital and performance efficiency. Overall, we propose a negative long-term effect of these strategies on the relationship between human capital and work unit performance.

Our model presents important theoretical implications for the strategic human capital literature. Perhaps most importantly, work units may be engaging in activities that undermine the return on their investment in human capital. Given the tremendous amount of resources invested in human capital, losing out on any of the return can be potentially disastrous. If work units are to capture

the returned value from these investments, they should minimize the degree to which they have extended work shifts, night work shifts, and unstable work shifts, as well as cultures that deprioritize sleep and emphasize constant connectivity. The irony is that some of the actions that work units take to maximize their performance can be harmful in the long run in that they disrupt the relationship between human capital and performance. Thus, work units may be helping themselves in the short term but unintentionally sabotaging themselves in the long term.

Beyond this contribution, by focusing on employee sleep at the unit level, we extend theory on how sleep influences work outcomes. Whereas previous research has focused almost entirely on sleep at the individual level of analysis, we contend that individual sleep patterns are nested within higher levels of analyses, including work units. This multilevel depiction of sleep provides a richer view of the relationship between sleep and work (cf. Barnes & Hollenbeck, 2009).

Moreover, our model changes the view of sleep. Rather than an activity outside of the control of organizations, organizations and work units can engage in activities that influence employee sleep in positive or negative directions. Although previous research has suggested that managers take an active role in shaping the sleep of subordinates (Barnes & Spreitzer, 2015), this work had been missing a theoretical model to work from. Our model advances the theory that can guide recommendations for how managers can shape the sleep of employees.

Conceptually, this model opens up multiple avenues for future research, beyond the necessary future step of testing this model. Our model suggests organizations avoid or reduce the use of human capital leveraging strategies by redesigning jobs if organizations want to obtain long-term competitive advantage. On the other hand, if some work or culture characteristics are necessarily required by certain types of jobs, we suggest organizations adjust other characteristics to reduce their negative effects on employee sleep. For example, night work shifts may be necessary for customer service-related jobs, but organizations may create a culture encouraging psychological detachment from work activities after they complete the shifts.

An important set of research questions for future research is the main effects of the work unit characteristics on performance. Our focus was on how they moderate the effects of human capital on performance. But they may have direct effects of their own in addition to such moderating effects. Future research may find some tradeoffs, such that cultures that prioritize work and deprioritize sleep lead to more work being completed, but at lower quality. Moreover, through their effects on sleep, these work unit effects may also influence other unit level outcomes, such as aggregated levels of turnover, deviance, and health.

Future research should also consider how to optimize the tradeoffs among creating sleepy-friendly work units versus optimizing other outcomes, such as number of hours worked, number of customers serviced, or number of missed customer requests. Indeed, some work units may create norms for constant connectivity because customers have demands that occur at unpredictable times of day. As noted by Perlow (2012), this can create a powerful context that leads to unintentional effects on both sleep and work life balance. However, Perlow also provides some solutions to this culture that are useful for work life balance, including predictable time off that is enabled by implementing systems that still provide constant customer support but allow employees to have well-defined downtime. Although Perlow did not include sleep in her study, her logic may apply to sleep as well.

Future research should also consider curvilinear effects in these relationships. Not only may there be curvilinear effects of the relationship between human capital leveraging strategies and employee sleep, but also in how employee sleep moderates the relationship between human capital and performance efficiency. Moreover, there are likely limits to the degree that human capital leveraging strategies enhance the effects of human capital on human capital utilization.

Another topic for future research is the manner in which employees self-select into different working environments. Those who are most sensitive to sleep disruption may find a poor fit between themselves and a work group that heavily utilizes human capital leveraging strategies. Such individuals may self-select out of that work unit, whereas other employees who are less sensitive may select into such a work group. It is also possible that individuals self-select into context based on the fit between their typical circadian schedule and the work schedule system of that unit. This may occur at the occupational level as well.

Finally, although our focus was on sleep, future research should consider other ways in which work units wear down employees that would have analogous moderating effects of the effects of human capital on performance. Stressful work contexts may play a similar role through emotional exhaustion. Cultures rife with abusive supervision or incivility may do the same. Overall, our depiction of human capital as an investment that can be derailed by poor maintenance of the human capital opens the door for multiple other topics relevant to employee health and well-being.

References

Åkerstedtt, T., Fredlund, P., Gillberg, M., & Jansson, B. (2002). Work load and work hours in relation to disturbed sleep and fatigue in a large representative sample. *Journal of Psychosomatic Research, 53,* 585–588. http://dx.doi.org/10.1016/S0022-3999(02)00447-6

Åkerstedtt, T., Knutsson, A., Westerholm, P., Theorell, T., Alfredsson, L., & Kecklund, G. (2002). Sleep disturbances, work stress and work hours: A cross-sectional study. *Journal of Psychosomatic Research, 53,* 741–748. http://dx.doi.org/10.1016/S0022-3999(02)00333-1

Åkerstedtt, T., Nordin, M., Alfredsson, L., Westerholm, P., & Kecklund, G. (2010). Sleep and sleepiness: Impact of entering or leaving shiftwork—A prospective study. *Chronobiology International, 27,* 987–996. http://dx.doi.org/10.3109/07420528.2010.489423

Anderson, C., & Dickinson, D. L. (2010). Bargaining and trust: The effects of 36-h total sleep deprivation on socially interactive decisions. *Journal of Sleep Research, 19,* 54–63. http://dx.doi.org/10.1111/j.1365-2869.2009.00767.x

Aschoff, J., Hoffmann, K., Pohl, H., & Wever, R. (1975). Re-entrainment of circadian rhythms after phase-shifts of the Zeitgeber. *Chronobiologia, 2,* 23–78.

Babkoff, H., Caspy, T., Mikulincer, M., & Sing, H. C. (1991). Monotonic and rhythmic influences: A challenge for sleep deprivation research. *Psychological Bulletin, 109,* 411–428. http://dx.doi.org/10.1037/0033-2909.109.3.411

Baranski, J. V., Cian, C., Esquievie, D., Pigeau, R. A., & Raphel, C. (1998). Modafinil during 64 hr of sleep deprivation: Dose-related effects on fatigue, alertness, and cognitive performance. *Military Psychology, 10,* 173–193. http://dx.doi.org/10.1207/s15327876mp1003_3

Barber, L., Barnes, C. M., & Carlson, K. (2013). Sleepy respondents: Random and systematic error effects of insomnia on survey behavior.

Organizational Research Methods, 16, 616–649. http://dx.doi.org/10.1177/1094428113493120

Barber, L. K., & Santuzzi, A. M. (2015). Please respond ASAP: Workplace telepressure and employee recovery. *Journal of Occupational Health Psychology, 20,* 172–189. http://dx.doi.org/10.1037/a0038278

Barnes, C. M. (2011). "I'll sleep when I'm dead": Managing those too busy to sleep. *Organizational Dynamics, 40,* 18–26. http://dx.doi.org/10.1016/j.orgdyn.2010.10.001

Barnes, C. M. (2012). Working in our sleep: Sleep and self-regulation in organizations. *Organizational Psychology Review, 2,* 234–257. http://dx.doi.org/10.1177/2041386612450181

Barnes, C. M., Ghumman, S., & Scott, B. A. (2013). Sleep and organizational citizenship behavior: The mediating role of job satisfaction. *Journal of Occupational Health Psychology, 18,* 16–26. http://dx.doi.org/10.1037/a0030349

Barnes, C. M., Gunia, B. C., & Wagner, D. T. (2015). Sleep and moral awareness. *Journal of Sleep Research, 24,* 181–188. http://dx.doi.org/10.1111/jsr.12231

Barnes, C. M., & Hollenbeck, J. R. (2009). Sleep deprivation and teams: Burning the midnight oil or playing with fire? *The Academy of Management Review, 34,* 56–66. http://dx.doi.org/10.5465/AMR.2009.35713280

Barnes, C. M., Lucianetti, L., Bhave, D., & Christian, M. (in press). You wouldn't like me when I'm sleepy: A multilevel model of sleep and abusive supervisor behavior. *Academy of Management Journal*.

Barnes, C. M., Schaubroeck, J. M., Huth, M., & Ghumman, S. (2011). Lack of sleep and unethical behavior. *Organizational Behavior and Human Decision Processes, 115,* 169–180. http://dx.doi.org/10.1016/j.obhdp.2011.01.009

Barnes, C. M., & Spreitzer, G. (2015). Managing the strategic resource of sleep: The key to human sustainability. *MIT Sloan Management Review, 56,* 19–21.

Barnes, C. M., & Wagner, D. T. (2009). Changing to daylight saving time cuts into sleep and increases workplace injuries. *Journal of Applied Psychology, 94,* 1305–1317. http://dx.doi.org/10.1037/a0015320

Barnes, C. M., Wagner, D. T., & Ghumman, S. (2012). Borrowing from sleep to pay work and family: Expanding time-based conflict to the broader non-work domain. *Personnel Psychology, 65,* 789–819. http://dx.doi.org/10.1111/peps.12002

Beaumont, M., Batejat, D., Pierard, C., Coste, O., Doireau, P., Van Beers, P., . . . Lagarde, D. (2001). Slow release caffeine and prolonged (64-h) continuous wakefulness: Effects on vigilance and cognitive performance. *Journal of Sleep Research, 10,* 265–276. http://dx.doi.org/10.1046/j.1365-2869.2001.00266.x

Belenky, G., Wesensten, N. J., Thorne, D. R., Thomas, M. L., Sing, H. C., Redmond, D. P., . . . Balkin, T. J. (2003). Patterns of performance degradation and restoration during sleep restriction and subsequent recovery: A sleep dose-response study. *Journal of Sleep Research, 12,* 1–12. http://dx.doi.org/10.1046/j.1365-2869.2003.00337.x

Berg, P., Appelbaum, E., Bailey, T., & Kalleberg, A. L. (2004). Contesting time: International comparisons of employee control of working time. *Industrial & Labor Relations Review, 57,* 331–349. http://dx.doi.org/10.2307/4126655

Bliese, P. D., & Halverson, R. R. (1996). Individual and nomothetic models of job stress: An examination of work hours, cohesion, and well-being. *Journal of Applied Social Psychology, 26,* 1171–1189. http://dx.doi.org/10.1111/j.1559-1816.1996.tb02291.x

Borbély, A. A., & Achermann, P. (1999). Sleep homeostasis and models of sleep regulation. *Journal of Biological Rhythms, 14,* 557–568.

Bowen, D. E., & Ostroff, C. (2004). Understanding HRM–firm performance linkages: The role of the "strength" of the HRM system. *The Academy of Management Review, 29,* 203–221.

Brainard, G. C., Hanifin, J. P., Greeson, J. M., Byrne, B., Glickman, G., Gerner, E., & Rollag, M. D. (2001). Action spectrum for melatonin regulation in humans: Evidence for a novel circadian photoreceptor. *The Journal of Neuroscience, 21,* 6405–6412.

Brett, J. M., & Stroh, L. K. (2003). Working 61 plus hours a week: Why do managers do it? *Journal of Applied Psychology, 88,* 67–78. http://dx.doi.org/10.1037/0021-9010.88.1.67

Buysse, D. J., Thompson, W., Scott, J., Franzen, P. L., Germain, A., Hall, M., . . . Kupfer, D. J. (2007). Daytime symptoms in primary insomnia: A prospective analysis using ecological momentary assessment. *Sleep Medicine, 8,* 198–208. http://dx.doi.org/10.1016/j.sleep.2006.10.006

Caldwell, J. A., Caldwell, J. L., Brown, D. L., & Smith, J. K. (2004). The effects of 37 hours of continuous wakefulness on the physiological arousal, cognitive performance, self-reported mood, and simulator flight performance of F-117A pilots. *Military Psychology, 16,* 163–181. http://dx.doi.org/10.1207/s15327876mp1603_2

Canessa, N., Castronovo, V., Cappa, S. F., Aloia, M. S., Marelli, S., Falini, A., . . . Ferini-Strambi, L. (2011). Obstructive sleep apnea: Brain structural changes and neurocognitive function before and after treatment. *American Journal of Respiratory and Critical Care Medicine, 183,* 1419–1426. http://dx.doi.org/10.1164/rccm.201005-0693OC

Caruso, C. C. (2006). Possible broad impacts of long work hours. *Industrial Health, 44,* 531–536. http://dx.doi.org/10.2486/indhealth.44.531

Caruso, C. C., Hitchcock, E. M., Dick, R. B., Russo, J. M., & Schmit, J. M. (2004). *Overtime and extended work shifts: Recent findings on illnesses, injuries, and health behaviors*. Cincinnati: NIOSH Publication Dissemination.

Christian, M. S., & Ellis, A. P. J. (2011). Examining the effects of sleep deprivation on workplace deviance: A self-regulatory perspective. *Academy of Management Journal, 54,* 913–934. http://dx.doi.org/10.5465/amj.2010.0179

Chuah, L. Y. M., Dolcos, F., Chen, A. K., Zheng, H., Parimal, S., & Chee, M. W. L. (2010). Sleep deprivation and interference by emotional distracters. *Sleep: Journal of Sleep and Sleep Disorders Research, 33,* 1305–1313.

Crook, T. R., Todd, S. Y., Combs, J. G., Woehr, D. J., & Ketchen, D. J., Jr. (2011). Does human capital matter? A meta-analysis of the relationship between human capital and firm performance. *Journal of Applied Psychology, 96,* 443–456. http://dx.doi.org/10.1037/a0022147

Czeisler, C. A., Duffy, J. F., Shanahan, T. L., Brown, E. N., Mitchell, J. F., Rimmer, D. W., . . . Kronauer, R. E. (1999). Stability, precision, and near-24-hour period of the human circadian pacemaker. *Science, 284,* 2177–2181. http://dx.doi.org/10.1126/science.284.5423.2177

Daley, M., Morin, C. M., LeBlanc, M., Grégoire, J. P., & Savard, J. (2009). The economic burden of insomnia: Direct and indirect costs for individuals with insomnia syndrome, insomnia symptoms, and good sleepers. *Sleep: Journal of Sleep and Sleep Disorders Research, 32,* 55–64.

Derks, D., van Mierlo, H., & Schmitz, E. B. (2014). A diary study on work-related smartphone use, psychological detachment and exhaustion: Examining the role of the perceived segmentation norm. *Journal of Occupational Health Psychology, 19,* 74–84. http://dx.doi.org/10.1037/a0035076

Drake, C. L., Roehrs, T., Richardson, G., Walsh, J. K., & Roth, T. (2004). Shift work sleep disorder: Prevalence and consequences beyond that of symptomatic day workers. *Sleep: Journal of Sleep and Sleep Disorders Research, 27,* 1453–1462.

Elmenhorst, D., Elmenhorst, E. M., Luks, N., Maass, H., Mueller, E. W., Vejvoda, M., . . . Samel, A. (2009). Performance impairment during four days partial sleep deprivation compared with the acute effects of alcohol and hypoxia. *Sleep Medicine, 10,* 189–197. http://dx.doi.org/10.1016/j.sleep.2007.12.003

Fulmer, I. S., & Ployhart, R. E. (2014). "Our most important asset": A multidisciplinary/multilevel review of human capital valuation for research and practice. *Journal of Management, 40,* 161–192. http://dx.doi.org/10.1177/0149206313511271

Gallup. (2014). *The "40-hour" workweek is actually longer*. Retrieved from http://www.gallup.com/poll/175286/hour-workweek-actually-longer-seven-hours.aspx

Ghumman, S., & Barnes, C. M. (2013). Sleep and prejudice: A resource recovery approach. *Journal of Applied Social Psychology, 43,* E166–E178. http://dx.doi.org/10.1111/jasp.12045

Gittell, J. H., Seidner, R., & Wimbush, J. (2010). A relational model of how high-performance work systems work. *Organization Science, 21,* 490–506. http://dx.doi.org/10.1287/orsc.1090.0446

Gold, D. R., Rogacz, S., Bock, N., Tosteson, T. D., Baum, T. M., Speizer, F. E., & Czeisler, C. A. (1992). Rotating shift work, sleep, and accidents related to sleepiness in hospital nurses. *American Journal of Public Health, 82,* 1011–1014. http://dx.doi.org/10.2105/AJPH.82.7.1011

Grandey, A. A. (2003). When "the show must go on": Surface acting and deep acting as determinants of emotional exhaustion and peer-rated service delivery. *Academy of Management Journal, 46,* 86–96. http://dx.doi.org/10.2307/30040678

Gujar, N., Yoo, S. S., Hu, P., & Walker, M. P. (2011). Sleep deprivation amplifies reactivity of brain reward networks, biasing the appraisal of positive emotional experiences. *The Journal of Neuroscience, 31,* 4466–4474. http://dx.doi.org/10.1523/JNEUROSCI.3220-10.2011

Haavisto, M. L., Porkka-Heiskanen, T., Hublin, C., Härmä, M., Mutanen, P., Müller, K., . . . Sallinen, M. (2010). Sleep restriction for the duration of a work week impairs multitasking performance. *Journal of Sleep Research, 19,* 444–454. http://dx.doi.org/10.1111/j.1365-2869.2010.00823.x

Hahn, V. C., & Dormann, C. (2013). The role of partners and children for employees' psychological detachment from work and well-being. *Journal of Applied Psychology, 98,* 26–36. http://dx.doi.org/10.1037/a0030650

Hancock, P. (2008). Cultures of sleep: Organization and the lure of dormancy. *Culture and Organization, 14,* 411–424. http://dx.doi.org/10.1080/14759550802489797

Harrison, Y., & Horne, J. A. (1999). One night of sleep loss impairs innovative thinking and flexible decision making. *Organizational Behavior and Human Decision Processes, 78,* 128–145. http://dx.doi.org/10.1006/obhd.1999.2827

Harrison, Y., & Horne, J. A. (2000). The impact of sleep deprivation on decision making: A review. *Journal of Experimental Psychology: Applied, 6,* 236–249. http://dx.doi.org/10.1037/1076-898X.6.3.236

Henle, C. A., Reeve, C. L., & Pitts, V. E. (2010). Stealing time at work: Attitudes, social pressure, and perceived control as predictors of time theft. *Journal of Business Ethics, 94,* 53–67. http://dx.doi.org/10.1007/s10551-009-0249-z

Horne, J. A. (1993). Human sleep, sleep loss and behaviour. Implications for the prefrontal cortex and psychiatric disorder. *The British Journal of Psychiatry, 162,* 413–419. http://dx.doi.org/10.1192/bjp.162.3.413

Hursh, S. R., Redmond, D. P., Johnson, M. L., Thorne, D. R., Belenky, G., Balkin, T. J., . . . Eddy, D. R. (2004). Fatigue models for applied research in warfighting. *Aviation, Space, and Environmental Medicine, 75,* A44–A53.

Johnson, M. L., Belenky, G., Redmond, D. P., Thorne, D. R., Williams, J. D., Hursh, S. R., & Balkin, T. J. (2004). Modulating the homeostatic process to predict performance during chronic sleep restriction. *Aviation, Space, and Environmental Medicine, 75,* A141–A146.

Kahn-Greene, E. T., Killgore, D. B., Kamimori, G. H., Balkin, T. J., & Killgore, W. D. S. (2007). The effects of sleep deprivation on symptoms of psychopathology in healthy adults. *Sleep Medicine, 8,* 215–221. http://dx.doi.org/10.1016/j.sleep.2006.08.007

Kahn-Greene, E. T., Lipizzi, E. L., Conrad, A. K., Kamimori, G. H., & Killgore, W. D. S. (2006). Sleep deprivation adversely affects interpersonal responses to frustration. *Personality and Individual Differences, 41,* 1433–1443. http://dx.doi.org/10.1016/j.paid.2006.06.002

Killgore, W. D. S., Balkin, T. J., & Wesensten, N. J. (2006). Impaired decision making following 49 h of sleep deprivation. *Journal of Sleep Research, 15,* 7–13. http://dx.doi.org/10.1111/j.1365-2869.2006.00487.x

Killgore, W. D. S., Kamimori, G. H., & Balkin, T. J. (2011). Caffeine protects against increased risk-taking propensity during severe sleep deprivation. *Journal of Sleep Research, 20,* 395–403. http://dx.doi.org/10.1111/j.1365-2869.2010.00893.x

Killgore, W. D. S., Killgore, D. B., Day, L. M., Li, C., Kamimori, G. H., & Balkin, T. J. (2007). The effects of 53 hours of sleep deprivation on moral judgment. *Sleep: Journal of Sleep and Sleep Disorders Research, 30,* 345–352.

Lanaj, K., Johnson, R., & Barnes, C. M. (2014). Beginning the workday yet already depleted? Consequences of late-night smartphone use and sleep. *Organizational Behavior and Human Decision Processes, 124,* 11–23. http://dx.doi.org/10.1016/j.obhdp.2014.01.001

Lavie, P. (1986). Ultrashort sleep-waking schedule. III. "Gates" and "forbidden zones" for sleep. *Electroencephalography and Clinical Neurophysiology, 63,* 414–425. http://dx.doi.org/10.1016/0013-4694(86)90123-9

Lavie, P. (1997). Melatonin: Role in gating nocturnal rise in sleep propensity. *Journal of Biological Rhythms, 12,* 657–665. http://dx.doi.org/10.1177/074873049701200622

Lavie, P. (2001). Sleep-wake as a biological rhythm. *Annual Review of Psychology, 52,* 277–303. http://dx.doi.org/10.1146/annurev.psych.52.1.277

Leana, C. R., & Feldman, D. C. (1992). *Coping with job loss: How individuals, organizations, and communities respond to layoffs*. New York, NY: Lexington Books.

Lee, M. D., MacDermid, S. M., & Buck, M. L. (2000). Organizational paradigms of reduced-load work: Accommodation, elaboration, and transformation. *Academy of Management Journal, 43,* 1211–1226. http://dx.doi.org/10.2307/1556346

Lim, J., & Dinges, D. F. (2010). A meta-analysis of the impact of short-term sleep deprivation on cognitive variables. *Psychological Bulletin, 136,* 375–389. http://dx.doi.org/10.1037/a0018883

Macey, P. M., Kumar, R., Woo, M. A., Valladares, E. M., Yan-Go, F. L., & Harper, R. M. (2008). Brain structural changes in obstructive sleep apnea. *Sleep: Journal of Sleep and Sleep Disorders Research, 31,* 967–977.

Mullins, H. M., Cortina, J. M., Drake, C. L., & Dalal, R. S. (2014). Sleepiness at work: A review and framework of how the physiology of sleepiness impacts the workplace. *Journal of Applied Psychology, 99,* 1096–1112. http://dx.doi.org/10.1037/a0037885

Munezawa, T., Kaneita, Y., Osaki, Y., Kanda, H., Minowa, M., Suzuki, K., . . . Ohida, T. (2011). The association between use of mobile phones after lights out and sleep disturbances among Japanese adolescents: A nationwide cross-sectional survey. *Sleep: Journal of Sleep and Sleep Disorders Research, 34,* 1013–1020. http://dx.doi.org/10.5665/sleep.1152

Nyberg, A. J., Moliterno, T. P., Hale, D., & Lepak, D. P. (2014). Resource-based perspectives on unit-level human capital a review and integration. *Journal of Management, 40,* 316–346. http://dx.doi.org/10.1177/0149206312458703

Ohayon, M. M., Smolensky, M. H., & Roth, T. (2010). Consequences of shiftworking on sleep duration, sleepiness, and sleep attacks. *Chronobiology International, 27,* 575–589. http://dx.doi.org/10.3109/07420521003749956

Olsen, O. K., Pallesen, S., & Eid, J. (2010). The impact of partial sleep deprivation on moral reasoning in military officers. *Sleep: Journal of Sleep and Sleep Disorders Research, 33,* 1086–1090.

Park, Y., Fritz, C., & Jex, S. M. (2011). Relationships between work-home segmentation and psychological detachment from work: The role of

communication technology use at home. *Journal of Occupational Health Psychology, 16,* 457–467. http://dx.doi.org/10.1037/a0023594

Perlow, L. A. (2012). *Sleeping with your smartphone: How to break the 24/7 habit and change the way you work*. Watertown, MA: Harvard Business Review Press.

Pilcher, J. J., & Huffcutt, A. I. (1996). Effects of sleep deprivation on performance: A meta-analysis. *Sleep: Journal of Sleep Research & Sleep Medicine, 19,* 318–326.

Ployhart, R. E., Nyberg, A. J., Reilly, G., & Maltarich, M. A. (2014). Human capital is dead; long live human capital resources! *Journal of Management, 40,* 371–398. http://dx.doi.org/10.1177/0149206313512152

Ployhart, R. E., Van Iddekinge, C. H., & MacKenzie, W. I. (2011). Acquiring and developing human capital in service contexts: The interconnectedness of human capital resources. *Academy of Management Journal, 54,* 353–368. http://dx.doi.org/10.5465/AMJ.2011.60263097

Presser, H. B. (1999). Toward a 24-hour economy. *Science, 284,* 1778–1779. http://dx.doi.org/10.1126/science.284.5421.1778

Reynolds, B., & Schiffbauer, R. (2004). Measuring state changes in human delay discounting: An experiential discounting task. *Behavioural Processes, 67,* 343–356. http://dx.doi.org/10.1016/S0376-6357(04)00140-8

Rupp, T. L., Wesensten, N. J., & Balkin, T. J. (2010). Sleep history affects task acquisition during subsequent sleep restriction and recovery. *Journal of Sleep Research, 19,* 289–297. http://dx.doi.org/10.1111/j.1365-2869.2009.00800.x

Rupp, T. L., Wesensten, N. J., Bliese, P. D., & Balkin, T. J. (2009). Banking sleep: Realization of benefits during subsequent sleep restriction and recovery. *Sleep: Journal of Sleep Research & Sleep Medicine, 32,* 311–321.

Schein, E. H. (2010). *Organizational culture and leadership* (4th ed.). San Francisco, CA: Wiley.

Schneider, B., Ehrhart, M. G., & Macey, W. H. (2013). Organizational climate and culture. *Annual Review of Psychology, 64,* 361–388. http://dx.doi.org/10.1146/annurev-psych-113011-143809

Scott, B. A., & Judge, T. A. (2006). Insomnia, emotions, and job satisfaction: A multilevel study. *Journal of Management, 32,* 622–645. http://dx.doi.org/10.1177/0149206306289762

Siegel, J. M. (2005). Clues to the functions of mammalian sleep. *Nature, 437,* 1264–1271. http://dx.doi.org/10.1038/nature04285

Smith, M. E., McEvoy, L. K., & Gevins, A. (2002). The impact of moderate sleep loss on neurophysiologic signals during working-memory task performance. *Sleep: Journal of Sleep Research & Sleep Medicine, 25,* 784–794.

Sonnentag, S., Binnewies, C., & Mojza, E. J. (2008). "Did you have a nice evening?" A day-level study on recovery experiences, sleep, and affect. *Journal of Applied Psychology, 93,* 674–684. http://dx.doi.org/10.1037/0021-9010.93.3.674

Sonnentag, S., & Fritz, C. (2007). The Recovery Experience Questionnaire: Development and validation of a measure for assessing recuperation and unwinding from work. *Journal of Occupational Health Psychology, 12,* 204–221. http://dx.doi.org/10.1037/1076-8998.12.3.204

Sonnentag, S., Kuttler, I., & Fritz, C. (2010). Job stressors, emotional exhaustion, and need for recovery: A multi-source study on the benefits of psychological detachment. *Journal of Vocational Behavior, 76,* 355–365. http://dx.doi.org/10.1016/j.jvb.2009.06.005

Sonnentag, S., Mojza, E. J., Demerouti, E., & Bakker, A. B. (2012). Reciprocal relations between recovery and work engagement: The moderating role of job stressors. *Journal of Applied Psychology, 97,* 842–853. http://dx.doi.org/10.1037/a0028292

Swanson, L. M., Arnedt, J. T., Rosekind, M. R., Belenky, G., Balkin, T. J., & Drake, C. (2011). Sleep disorders and work performance: Findings from the 2008 National Sleep Foundation Sleep in America poll. *Journal of Sleep Research, 20,* 487–494. http://dx.doi.org/10.1111/j.1365-2869.2010.00890.x

Van Dongen, H. P. A., Maislin, G., Mullington, J. M., & Dinges, D. F. (2003). The cumulative cost of additional wakefulness: Dose-response effects on neurobehavioral functions and sleep physiology from chronic sleep restriction and total sleep deprivation. *Sleep, 26,* 117–126.

Ventskovska, O., Porkka-Heiskanen, T., & Karpova, N. N. (2015). Spontaneous sleep-wake cycle and sleep deprivation differentially induce Bdnf1, Bdnf4, and Bdnf9a DNA methylation and transcripts levels in the basal forebrain and frontal cortex in rats. *Journal of Sleep Research, 24,* 124–130.

Wagner, D. T., Barnes, C. M., Lim, V. K., & Ferris, D. L. (2012). Lost sleep and cyberloafing: Evidence from the laboratory and a daylight saving time quasi-experiment. *Journal of Applied Psychology, 97,* 1068–1076. http://dx.doi.org/10.1037/a0027557

Wagner, D. T., Barnes, C. M., & Scott, B. A. (2014). Driving it home: How workplace emotional labor harms employee home life. *Personnel Psychology, 67,* 487–516. http://dx.doi.org/10.1111/peps.12044

Wagner, U., Gais, S., Haider, H., Verleger, R., & Born, J. (2004). Sleep inspires insight. *Nature, 427,* 352–355. http://dx.doi.org/10.1038/nature02223

Walker, M. P., & Stickgold, R. (2006). Sleep, memory, and plasticity. *Annual Review of Psychology, 57,* 139–166. http://dx.doi.org/10.1146/annurev.psych.56.091103.070307

Wood, B., Rea, M. S., Plitnick, B., & Figueiro, M. G. (2013). Light level and duration of exposure determine the impact of self-luminous tablets on melatonin suppression. *Applied Ergonomics, 44,* 237–240. http://dx.doi.org/10.1016/j.apergo.2012.07.008

World Finance. (2011). *Modern markets demand constant connectivity*. Retrieved from http://www.worldfinance.com/home/news/modern-markets-demand-constant-connectivity

Wright, P. M., & McMahan, G. C. (2011). Exploring human capital: Putting "human" back into strategic human resource management. *Human Resource Management Journal, 21,* 93–104. http://dx.doi.org/10.1111/j.1748-8583.2010.00165.x

Wright, P. M., McMahan, G. C., & McWilliams, A. (1994). Human resources and sustained competitive advantage: A resource-based perspective. *International Journal of Human Resource Management, 5,* 301–326. http://dx.doi.org/10.1080/09585199400000020

Yoo, S. S., Gujar, N., Hu, P., Jolesz, F. A., & Walker, M. P. (2007). The human emotional brain without sleep: A prefrontal amygdala disconnect. *Current Biology, 17,* R877–R878. http://dx.doi.org/10.1016/j.cub.2007.08.007

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