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You Wouldn't Like Me When I'm Sleepy: Leader Sleep, Daily Abusive Supervision, and Work Unit Engagement

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Abstract: We examine daily leader sleep as an antecedent to daily abusive supervisory behavior and work unit engagement. Drawing from ego depletion theory, our theoretical extension includes a serial mediation model of nightly sleep quantity and quality as predictors of abusive supervision. We argue that poor nightly sleep influences leaders to enact daily abusive behaviors via ego depletion, and these abusive behaviors ultimately result in decreased daily subordinate unit work engagement. We test this model through an experience sampling study spread over ten work days with data from both supervisors and their subordinates. Our study supports the role of the indirect effects of sleep quality (but not sleep quantity) via leader ego depletion and daily abusive supervisor behavior on daily subordinate unit work engagement.

Abusive supervision – the "sustained display of hostile verbal and nonverbal behavior, excluding physical contact" of supervisors toward subordinates, as perceived by subordinates (Tepper, 2000: 178) – has pervasive and negative effects on employees, their work outcomes, and organizations. Over the past decade and a half, researchers have investigated the deleterious effects of abusive supervision, particularly on subordinate affect, attitudes, motivation, and job performance (for a recent meta-analysis, see Schyns & Schilling, 2013). Thus, understanding why and under what circumstances supervisors might be abusive is paramount for researchers and practitioners interested in improving a variety of organizationally relevant outcomes.

However, researchers have recently noted two important limitations to theory explaining abusive supervision. First, as noted by Tepper (2007) and again in Tepper, Moss, and Duffy (2011), theory and research on abusive supervision has focused much more on outcomes of abusive supervision than antecedents. Although the outcomes of abusive supervision are important, a sound understanding of its causes is necessary to enable management theory to guide managers towards reducing abusive supervision.

A second limitation is that research on abusive supervision has typically taken a static approach, implicitly assuming that some supervisors engage in abusive supervision and some do not, rather than examining whether this behavior fluctuates within a given supervisor. This assumption is highlighted by the word "sustained" in the definition of abusive supervision. Tepper (2007: 265) explicitly notes that "abusive supervision involves continuing exposure to hierarchical mistreatment—a boss who has a bad day and takes it out on his or her subordinates by exploding at them would not be considered an abusive supervisor unless such behavior became a regular feature of his or her repertoire." Thus, although research has confirmed the proposition that some supervisors are often abusive, whereas others are usually not abusive, this

definition is restricted to a leader's "style," or behaviors on average. Thus, much of the research on abusive supervision has developed around the examination of "abusive supervisors," precluding the possibility that any leader could be high in abusive supervision on one day and low on abusive supervision on another day.

With our research, we offer a complementary perspective to the between-persons paradigm of abusive supervisors by examining abusive supervisory behaviors, which we argue fluctuate within-person on a daily basis. Emerging evidence suggests that leaders might be more (or less) abusive on some days than on others. Johnson, Venus, Lanaj, Mao, and Chang (2012) found that abusive supervisory behavior varied more within-supervisors than it did between supervisors. In other words, supervisors exhibited more within-person variation in abusive behavior than was observed for comparisons between supervisors. Building from this research, we expand Tepper's (2000) definition of abusive supervision to examine abusive supervisory behaviors, defined as any display of hostile verbal and nonverbal behavior, excluding physical contact. With our research, we examine how these behaviors are likely to vary on a day-to-day basis, and refer to them henceforth as daily abusive supervision. We posit that not only is there potentially more predictive power within individuals than between individuals, but a less static view of abusive supervision allows for interventions that can potentially apply to a broad set of employees. This opens options beyond staffing for managing abusive supervision. Interventions aimed at improving daily self-control and mood, such as breaks, positive events, or even a mindfulness exercise, could potentially set the stage for low abusive supervision on a given day. However, an important question remains unanswered: What factors that were previously assumed to be simply noise may account for daily abusive supervision?

Accordingly, the purpose of this paper is to take a within-person approach to extend theory on abusive supervision by examining daily antecedents and outcomes. Specifically, we draw from theory on ego depletion to examine nightly sleep quantity and quality as antecedents of daily abusive supervisor behavior. Moreover, our conceptual framework suggests that when supervisors are depleted and thus abusive, there will be regulatory consequences that "trickle-down," to the work unit, sapping their collective work engagement, or the willingness of the members of the unit to self-regulate by investing energy in their work tasks. Thus, we expand the abusive supervision literature by hypothesizing that daily abusive supervision reduces unit work engagement. We move beyond traditional static approaches to studying the antecedents of abusive supervision by proposing that daily abusive supervisor behavior varies in part on the quantity and quality of sleep the night before. Moreover, this includes a crossover view, in that leader sleep influences work unit engagement. Consistent with our theorizing, we test our model of sleep and daily abusive supervisor behavior using a sample of supervisor-led work units and an experience sampling method research design.

ABUSIVE SUPERVISION: MOVING TO A DAILY APPROACH

As noted by Tepper (2007) and Tepper, Moss, and Duffy (2011), theory and research on abusive supervision has focused much more on outcomes of abusive supervision than antecedents. However, this nascent area of research has been helpful in beginning to explore important antecedents such as justice, subordinate characteristics, and diversity (Aquino, Grover, Bradfield, & Allen, 1999; Aryee, Chen, Sun, & Debrah, 2007; Tepper, Duffy, Henle, & Lambert, 2006; Tepper, Moss, & Duffy, 2011). This research has begun to open the topic of antecedents to abusive supervision, although from a relatively static, cross-sectional point of view. However, no studies have considered factors that (a) vary on a daily basis such as sleep and (b) are proximally

aligned with self-regulatory models, which we argue can expand our understanding of what causes abusive supervision. Models of sleep and work require a daily focus in order to be properly specified at the correct level of analysis (Klein & Kozlowski, 2000). Although there are clearly important relationships between abusive supervision and other constructs at the between-person level of analysis (c.f. Tepper, 2007), the baseline assumption that there is nothing of importance in the domain of abusive supervision occurring at the within-level of analysis may be a model misspecification. In the specific case of leader sleep and work unit engagement, both the conceptual development and the data are consistent with daily variance as the focus.

Leadership research has long contended that leadership occurs within a specific context, and a specific set of circumstances (c.f. DeRue, 2011). For example, leaders can switch from a directive set of behaviors to an empowering set of behaviors (Lorinkova, Pearsall, & Sims, 2013). Although the leadership literature has focused on long term changes in leader behavior, human behavior in general also varies on a much shorter time scale, based on dynamic factors such as mood, self-control, salient goals, and activated identities (Barnes et al., 2011; Dalal, Lam, Weiss, Welch, & Hulin 2009; Leavitt et al., 2012; Scott et al., 2012; Venus, Stam, & van Knippenberg, 2013). Leadership is determined in part by dynamic variables such as mood and identity (Johnson et al., 2012; Venus, Stam, & van Knippenberg, 2013), and should also naturally vary over time on similar time scales. Indeed, Johnson et al. (2012) found that abusive supervision varied on a daily basis, and that this variance was greater than between-persons variance. Thus, abusive behaviors might be linked to within-person variables that vary over time. The substantial body of work of within-person variability in affect (e.g., Dalal, et al, 2009; Glomb, Bhave, Miner, & Wall, 2011) suggests that no person is always pleasant or always unpleasant. Building from this premise, individuals may be abusive on one day but not on others.

Johnson and colleagues (2012) advanced theory by showing the degree to which leaders were (in)consistent from day-to-day in their level of abusive supervisory behavior; however, Johnson and colleagues (2012) did not investigate day-level predictors of this daily variance. Thus, their results pave the way for further research taking a daily view of the factors that lead to, and result from, daily abusive supervision. In order to enhance the richness of the abusive supervision literature in this new direction, we examine "daily abusive supervision", turning our focus to abusive behaviors, rather than the leader's style. This construct is defined the same as the original abusive supervision construct was defined by Tepper (2000), with the exception that we refer to behaviors—which are variable within-person—rather than a supervisor's preferred method of supervision, and we remove the constraint that the behavior is sustained over prolonged periods of time. This definition enables us to investigate daily fluctuations. In other words, we argue that abusive behavior engaged in on a single day is still abusive and meaningful. Thus, in addition to being associated with a leadership style, supervisory abuse is a behavior that can vary on a daily basis. Our work links back to the larger topic of abusive supervision, but allows for growth in a useful direction. We hope that it opens further research questions beyond the model that we test in our paper.

SLEEP, EGO DEPLETION, AND ABUSIVE SUPERVISION

Leaders may often experience situations or events that create tempting impulses or urges to engage in abusive supervisory behavior in their interactions with subordinates. Frustration with a lack of progress on a project or with interpersonal conflict may create an urge to yell or speak uncivilly towards a given subordinate (c.f., Tepper, Moss, & Duffy, 2011). Encountering a mistake made by an employee might create an impulse to publicly belittle the employee. Having ideas criticized by an employee might induce the urge to coerce the subordinate into silence. We

argue that leaders sometimes struggle to control these impulses, and that a primary reason for their inability to overcome them is failures in self-regulation.

Self-regulation is the psychological process by which counter-normative urges and impulses are controlled (Muraven & Baumeister, 2000). Ego depletion theory describes how the ability to exert self-regulation waxes and wanes over time. According to ego depletion theory, all forms of self-regulation draw from a single finite pool of resources (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven & Baumeister, 2000). Engaging in acts requiring self-regulation depletes this pool, leaving them less able to do so until the resources are recovered. Recent research indicates that ego depletion leads people to be especially likely to fail in resisting temptations to engage in negative behaviors (c.f., Gino, Schweitzer, Mead, & Ariely, 2011). Examples of such behavior induced by ego depletion include lying (Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009), cheating (Christian & Ellis, 2011), deception (Welsh, Ellis, Christian & Mai, 2014), and other unethical behavior (Barnes, Schaubroeck, Huth, & Ghumman, 2011). Moreover, the capacity for self-regulation is dynamic, and can be depleted by a range of factors (for a meta-analysis, see Hagger, Wood, Stiff, & Chatzisarantis, 2010).

Recent extensions to ego depletion theory indicate an important antecedent to self-regulation that is relevant to all employees: sleep. Self-regulation may be affected by both sleep quantity – the amount of time an individual spends in a sleeping state – and by sleep quality – which refers to difficulty of falling asleep and staying asleep (Barnes, 2012). Barnes further notes that sleep quantity and quality have parallel additive effects on self-regulation. This is in line with the proposition of Baumeister, Muraven, and Tice (2000) that sleep is important for the recovery of physiological resources involved in self-regulation. Moreover, sleep physiologists

have found that a lack of sleep leads to socially inappropriate behavior (Horne, 1993), suggesting the possibility of impaired self-control.

Emerging physiological evidence supports this view, suggesting that sleep deficiencies impair the functioning of structures in the brain that are critical to self-regulation. A growing literature in neurophysiology indicates that self-regulation relies disproportionately on the prefrontal cortex and amygdala regions of the brain (Banks, Eddy, Angstadt, Nathan, & Phan, 2007; Beauregard, Levesque, & Bourgouin, 2001; Chuah et al., 2010; Nilsson et al., 2005; Ochsner et al., 2004). These regions are fueled by glucose (Fairclough & Houston, 2004), which is utilized throughout the day and replenished during sleep. Brain-imaging studies indicate a decrease in cerebral metabolism under conditions of sleep deprivation and insomnia, most notably in the prefrontal cortex (Altena et al., 2008; Thomas et al., 2000). Thus, neurophysiological research indicates that sleep is an important determinant of self-regulation.

Given the importance of self-regulated behavior in organizations, its connection with sleep has recently been targeted by management researchers. Christian and Ellis (2011) found that compared to sleeping 6 hours or more, nurses sleeping fewer than 6 hours in a night had reduced resources and increased organizational deviance the next day. Barnes et al. (2011) similarly found that a lack of sleep led to resource depletion, producing unethical behavior. Ghumman and Barnes (2013) found that a lack of sleep led to impairments in the suppression of prejudice. Barber, Barnes, and Carlson (2013) found that sleep difficulties led to decrements in self-regulation, in turn undermining attempts at social desirability. Wagner, Barnes, Lim, and Ferris (2012) found that a lack of sleep led to an increase in cyberloafing at work.

Every day and night, employees make choices between allocating time toward sleep versus other competing activities such as time spent working, with family, or recreating (Barnes,

Wagner, & Ghumman, 2012). Consistent with this, Knutson, Rathouz, Yan, Liu, and Lauderdale (2007) conducted a large scale study of sleep, and found that the within-person standard deviation exceeded the between-person standard deviation. Recent management studies have found day-level relationships between sleep (quantity and quality) and several workplace phenomena, including affect, job satisfaction, unethical behavior, surface acting, and time spent working (Barnes et al., 2011; Barnes et al., 2012; Christian & Ellis, 2011; Scott & Judge, 2006; Sonnentag, Binnewies, & Mojza, 2008; Wagner et al., 2014; Welsh, et al., 2014).

Specific to the topic of daily self-regulation, Barnes et al. (2011) and Christian and Ellis (2011) extended theory on ego depletion to indicate that sleep varies along with self-regulatory capacity on a daily basis. Self-regulatory resources are depleted daily, and replenished during sleep. Thus, a lack of sleep in a given night leaves an individual with depleted self-regulation the next day. Consistent with this reasoning, Barnes et al. (2011) provided evidence from a diary study showing daily relationships between sleep quantity/quality and self-regulation, as did Christian and Ellis (2011), who manipulated one night of sleep deprivation. Thus, we expect daily leader sleep quantity and quality to influence the leader's ego depletion on the next day.

Hypothesis 1a*: Daily leader sleep quantity is negatively related to daily leader ego depletion.*

Hypothesis 1b*: Daily leader sleep quality is negatively related to daily leader ego depletion.*

As we note above, leaders face many temptations to engage in abusive behavior toward subordinates, especially when they experience stress, frustration, and difficulties at work. Suppressing those temptations and behaving in a civil manner requires self-regulation. As noted in Hypotheses 1a and 1b, we expect sleep to influence self-regulation. Thus, we contend that

sleep on a given night (both quantity and quality) will influence abusive supervisory behavior the next day, and that ego depletion will mediate this effect.

Although previous research has not examined this relationship directly, it does lend indirect support. Horne (1993) found that sleep deprivation led to an increase in interpersonally inappropriate behavior. Kahn-Greene, Lipizzi, Conrad, Kamimori, & Killgore (2006) found that sleep deprivation leads to frustration, lack of willingness to accept blame, increased tendency to blame others, and weakened inhibition of aggression. As reviewed by Tepper (2007), several studies show that displaced feelings of aggression are a likely antecedent of abusive supervision (Aryee, Chen, Sun, & Debrah, 2007; Hoobler & Brass, 2006; Tepper, Duffy, Henle, & Lambert, 2006). Thus, leaders who have weakened inhibition from a nightly sleep deficiency and are frustrated or blame others are likely to engage in abusive supervision. Indeed, Barnes (2012) argued that low sleep quantity and poor sleep quality would lead to workplace incivility. Accordingly, drawing from an ego depletion approach, we hypothesize that daily sleep quantity and quality will negatively influence daily abusive supervision through the mediator of ego depletion.

Hypothesis 2*: Daily leader ego depletion is positively related to daily abusive supervisor behavior.*

Hypothesis 3*: Daily leader ego depletion mediates the effects of (a) daily leader sleep quantity and (b) daily leader sleep quality on daily abusive supervisor behavior.*

EFFECTS ON UNIT WORK ENGAGEMENT

Abusive supervision involves subordinate perceptions of mistreatment by their supervisor and should thus affect subordinate outcomes. We focus, in particular, on a motivational outcome—daily unit level work engagement—for three reasons. First, our ego depletion framework specifies the critical role of self-regulatory resources underlying supervisor behavior, and we extend this line of reasoning to suggest that follower behavior is similarly underpinned by motivation and willingness to allocate self-regulatory energy to tasks. Second, subordinate motivation is proximal psychologically to abusive behavior and thus likely to be a strong psychological outcome for subordinates experiencing abusive supervision (c.f., Schyns & Schilling, 2013). Third, a primary function of leadership is to instill motivation and meaning in their group of followers (e.g., Avolio, 1990), thus work engagement is conceptually linked to leader behavior (Christian et al., 2011; Macey & Schneider, 2008).

Work engagement is a state of cognitive, emotional, and physical investment in one's personal experience or performance of work (Christian et al., 2011; Kahn, 1990; 1992; Rich, LePine, & Crawford, 2010). In a review of the work engagement literature, Bakker (2014) notes that work engagement fluctuates on a daily basis, and that this daily fluctuation is driven in part by negative employee experiences at work. Indeed, several recent articles empirically support the idea that daily fluctuation in engagement is meaningful and predictable (Bakker & Despoina, 2009; Breevaart, Bakker, & Demerouti, 2014; Christian, et al., 2011; Lanaj et al., 2014; Sonnentag, 2003; Sonnentag et al., 2009).

Moreover, work engagement occurs collectively. Workers who are treated poorly and experience disengagement as a result will be likely to engage in collective sensemaking processes whereby they affect each other's daily work engagement (Costa, Passos, & Bakker, 2014). We conceptualize work engagement at the unit level, following the lead of others (e.g.,

Barrick, Thurgood, Smith, & Courtright, in press, Harter, Schmidt, & Hayes, 2002; Salanova, Agut, & Piero, 2005). Unit-level engagement is a conceptually appropriate level of analysis for examining outcomes of leadership, because a leader's influence tends to produce shared responses among subordinates (e.g., Christian, Christian, Garza, & Ellis, 2012; George, 2000). Subordinates within the same work unit are likely to have similar levels of exposure to abusive supervision on a given day, such that multiple subordinates will be exposed to that same behavior. Moreover, group members tend to converge in their affect, attitudes, and behavior (Bhave, Kramer, & Glomb, 2010; Duffy, Shaw, & Stark, 2000; Felps, Mitchell, Hekman, Lee, Holtom, & Harman, 2009; Sy & Choi, 2013), as they interact and make sense of social and environmental information as a group (Salancik & Pfeffer, 1977).

Indeed, unit level engagement has been shown to converge among unit-members (Salanova et al., 2005). Work unit engagement has beneficial effects on important outcomes such as firm performance (Barrick, et al., in press), service climate, unit performance, and customer loyalty (Salanova, Agut, & Piero, 2005), as well as having cross level effects on individual burnout (Bakker, van Emmerik, & Euwema, 2006). This is further consistent with our topic of abusive supervision; recent research illustrates aggregate subordinate responses to abusive supervision (Priesemuth, Schminke, Ambrose, & Folger, in press).

Work engagement is related to leadership to the extent that effective leaders help subordinates to view their work as meaningful and valuable, and to attach their identities to the work itself (Bono & Judge, 2003; Grant, 2012). Thus, leader behavior may influence the extent to which subordinates feel personally invested in the work they perform, especially to the degree to which a leader is fair and trustworthy and engenders feelings of psychological safety (Kahn, 1990; Macey & Schnieder, 2008). Abusive supervision is inconsistent with signals of

competence, value, and respect (Mayer, Thau, Workman, Dijke, & De Cremer, 2012). By providing an experience that employees will find aversive, abusive supervision should leave employees more likely to withdraw than to engage themselves heavily in their work. Related research indicates that CEO leadership influences collective organizational engagement (Barrick et al., in press). Although we examine work units rather than firms as a whole, the logic is similar in that leaders influence the engagement of subordinates within their collective.

We integrate unit work engagement into our model of sleep and abusive supervision. Specifically, as indicated in Hypothesis 3, sleep quantity and quality will negatively influence daily abusive supervision through the mediating mechanism of ego depletion. As indicated in our logic above, daily abusive supervision will negatively influence daily unit engagement. Therefore, we expect a relationship with two levels of serial mediation, such that the effects of leader sleep are transmitted to subordinate unit engagement first through leader ego depletion and then through daily leader abusive supervision. Figure 1 depicts the full conceptual model.

Hypothesis 4: *Daily abusive supervision will be negatively related to daily unit work engagement.*

Hypothesis 5a*: Daily leader ego depletion and daily abusive supervisor behavior will serially mediate the daily leader sleep quantity to daily unit work engagement relationship.*

Hypothesis 5b*: Daily leader ego depletion and daily abusive supervisor behavior will serially mediate the daily leader sleep quality to unit work engagement relationship.*

METHOD

Sample

We drew our participants from Amadeus - Bureau Van Dijk (https://aida.bvdinfo.com/), a database of public and private firms which include domestic and multinational firms in Italy. We contacted managers from these organizations and informed them about our study. After managers expressed their respective organizations' willingness to participate in the study, we informed employees of these organizations via e-mail about the project and invited them to sign up individually for the study. We offered feedback about the study results after completion of data collection as an incentive for participation. Participants were from a variety of industries and occupations, including accounting, supply chain, operation management, human resources, and marketing in the industries of banking, information technology, and health care. 99 supervisors agreed to allow the administration of surveys, and completed the surveys themselves. Their workgroups ranged from 3-8 members, with a mean of 4.6 per group. We received completed questionnaires from 261 subordinates, representing a response rate of 57%. Across groups, response rates ranged from 25% to 100%.

For supervisors, 28% of respondents were female; 6% were between 18 and 30 years old, 25% between 31 and 40, 33% between 41 and 50 and 35% were older than 51 (mean 46 years, SD 9.8). Twenty two percent of supervisors worked within the current position for less than 2 years, 15% between 2 and 4 years, 24% between 4 and 6 years, and 38% worked more than 6 years in the current positions. Mean supervisor tenure with their organizations was 7 years (SD 5.8).

Forty percent of subordinates were female; 26% were between 18 and 30 years old, 36% between 31 and 40, 25% between 41 and 50 and 13% were older than 51 (mean 38 years, SD 9.8). Twenty eight percent of subordinates worked with the current supervisor for less than 1 year, 47% between 2 and 4 years, 12% between 4 and 6 years, and 13% worked more than 6

years with the current supervisor (mean 3.6 years, SD 3.3). In the sample, on average subordinates interacted with their current supervisors "rarely" 2%, "once every few weeks" 9%, "once per day" 13%, "a few times per day" 23% and "several times per day" 53%.

Overall, we received 826 out of 990 possible supervisor surveys (83.43% response rate) and 2148 out of 2610 possible subordinate surveys (82.30%) out of those participating. Ten supervisors either provided less than 2 surveys or did not meet the minimum requirement of having at least one subordinate who completed at least 2 surveys, and were thus removed from the data. As noted below, subordinate-days in which subordinates had either "none" or "little" contact with their supervisors were left out of the data. After the available daily subordinate surveys were matched with the available daily supervisor surveys, and were aggregated to the supervisor-level, it yielded a final sample of 606 unit-days nested within 88 supervisors.

Procedures

Participants were recruited through contacts with their organizations. Individuals who indicated an interest in participating were presented with the informed consent document. This provided instructions for the study, as well as assurances of confidentiality. Surveys were provided in Italian, the native language of the participants. To develop the Italian version of the surveys, we followed the translation-back translation procedures outlined by Brislin (1986).

Supervisors first completed a baseline survey. In order to capture daily variance in the constructs of our model, the rest of the study used interval-contingent experience-sampling methodology (see Alliger & Williams, 1993; Wheeler & Reis, 1991). Similar to the majority of experience sampling research in the management literature, we chose a 2 week period. This is consistent with Reis and Wheeler's (1991) suggestion that two weeks represents a generalizable sample of individuals' lives. During the two weeks of the study (including only workdays),

participants were asked to complete 1 survey per day. Supervisors were asked to complete their surveys at the beginning of their workday (measuring supervisor sleep and ego depletion), and subordinates were asked to complete their surveys at the end of their workday (all other measures). This allowed for temporal precedence, with the independent variables and first stage mediator (supervisor sleep quantity and quality, and supervisor ego depletion) measured earlier in the workday than the second stage mediator and outcome (abusive supervisor behavior and subordinate work engagement).

Measures

Supervisor sleep. Supervisor sleep was measured with the Pittsburgh Sleep Diary (Monk et al., 1994). Participants were asked the time at which they went to bed, how long it took to fall asleep, what time they woke in the morning, and how long they were awake after initially falling asleep. Time awake after initially falling asleep is referred to in the sleep physiology literature as "wakefulness after sleep onset" (WASO). In the instructions to participants, in the WASO question, participants were provided with an example to help them understand the meaning ("For example, if you were asleep until 1am, woke at 1am and fell back asleep at 1:20am for the rest of the night, your answer would be 20 minutes"). These times were used to calculate the number of minutes spent asleep, which was how we operationalized sleep quantity. Previous research indicates that this measure of sleep quantity correlates with objective measures of sleep quantity (Barnes et al., 2011). We reverse-coded WASO, which captures interruptions to sleep, as our operationalization of sleep quality. This follows the same approach as previous research in management measuring sleep quality with interruptions to sleep (Wagner et al., 2012).

Daily Leader Ego Depletion. To measure daily ego depletion, we used the 5 item scale that Lanaj et al. (2014) selected to measure ego depletion in a diary study format. These items

originally came from Twenge et al. (2004). Participants were instructed to indicate the degree to which they agreed with each item on a 5 point Likert scale, in which 1=*very slightly or not at all* and 5=very much. A sample item is "My mental energy is running low." Average coefficient alpha for this scale was .92.

Daily Abusive Supervisor Behavior. To measure daily abusive supervisor behavior, we used the 5 item scale that Johnson et al. (2012) specifically developed to measure daily abusive supervision. Participants were instructed to indicate the "frequency with which your supervisor engaged in each of the 5 behaviors **today at work**", using a 6 point Likert scale provided in increments of 1 occasion, in which 1=*never* and 6=*5 or more*. A sample item is "Behaved in a nasty or rude manner toward a group member". Average coefficient alpha for this scale was .78.

Daily Unit Work Engagement. Work engagement was measured with 3 items drawn from Schaufeli, Bakker, and Salanova (2006) and validated for use in a daily survey context by Lanaj et al. (2014), one item for each conceptual dimension of work engagement, physical, emotional, and cognitive (cf. Rich et al., 2011). In their pilot work, Lanaj et al. (2014) found that the shortened version of the Schaufeli et al. (2006) work engagement scale correlated with the full version at r=.83 (p<.01).The items were reworded to focus on daily engagement, and participants were asked to indicate the degree to which they agreed with the items on a 5 point Likert scale in which 1=*strongly disagree* and 5=*strongly agree*.

A recent meta-analysis indicates that when assessing and aggregating affectively-laden variables (i.e., work engagement) at the group-level, a direct consensus model may be more appropriate than a referent shift model (Wallace, Edwards, Paul, Burke, Christian, & Eissa, 2013). Wallace et al. argue that an employee's assessment of the work environment relative to their personal affective experience is more accurate than an employee's assessment of the

affective experiences of others inside and outside of one's workgroup. As Wallace and colleagues (2013) recommend, direct consensus models are appropriate for constructs that have affective components, withstanding sufficient within-group agreement statistics. Thus, we used items that measured individual engagement and then aggregated to the work unit level (aggregation information is provided later in this manuscript). An example item for cognitive engagement is "Today, I was immersed in my work." Average coefficient alpha for this measure was .86.

Control and Cutoff Measures. Participants who have either no contact or only a little contact with their supervisor in a given day possess insufficient information to rate the abusive behavior of their supervisor on that day. Accordingly, we asked participants "How much contact did you have today with your supervisor?", with responses on a 5 point Likert scale in which 1=*none*, 2=*little*, 3=*a moderate amount*, 4=*quite a bit*, and 5=*a high amount of contact*. We included subordinate responses only on days in which their contact with their supervisor was 3 or greater on this scale, analogous to the approach previously used by Pugh, Groth, and Hennig-Thurau (2011) and Bono et al. (2007) to target the questionnaire toward those with sufficient information to answer it.

Trait anxiety has been linked to both sleep problems (LeBlanc, Mérette, Savard, Ivers, Bailargeon, & Morin, 2009) and negative behaviors from leaders (Kant, Skogstad, Torsheim, & Einarsen, 2013). Thus, in order to eliminate anxiety as a confound in the relationship between leader sleep and abusive supervision, we included leader trait anxiety as a control variable. Following Wagner, Barnes, and Scott (2014), we used a 4 item measure of anxiety drawn from MacKinnon, Jorm, Christensen, Korten, Jacomb, and Rodgers (1999). Participants rated on a 5

item Likert scale the degree to which each of 4 adjectives described them "on average". Sample adjectives include "nervous" and "distressed". Coefficient alpha for this scale was .74.

ANALYSIS

Given the multilevel nature of our model, the data collected to test our model included nesting that violates assumptions of independence of observations required for ordinary least squares regression analyses. Accordingly, we conducted our analyses in multilevel format using Mplus (Muthén & Muthén, 1998-2010). Furthermore, in order to test the proposed serial mediation, we performed multilevel path analysis (MacKinnon, 2008; Preacher, Zyphur, & Zhang, 2010). Specifically, in order to test the serial mediation, in our model daily leader sleep quantity and quality were the independent variables, daily leader ego depletion was the first-stage mediator, daily abusive supervision was the second-stage mediator, and unit work engagement was the dependent variable. We test and report mediation through a test of the statistical significance of the indirect effect and its associated confidence interval (MacKinnon, 2008). The data consisted of 2 levels. The lowest level (Level 1) comprised daily unit ratings, leader sleep and ego depletion, which were nested within leader our leader control variable- (Level 2).

In order to empirically justify aggregation of subordinate ratings of a given leader on a given day and aggregation of subordinate daily ratings to unit daily ratings, we conducted ICC analyses. This analysis indicates what proportion of the variance is accounted for by the group level, and whether or there is significant nesting. For leader daily abusive supervision ICC(1)= .43 (p<.01) and ICC(2) = .91, F=1.87. For daily unit work engagement, ICC(1) = .48 (p<.01) and ICC(2) = .65, F=2.81. These values all support the aggregation we indicated in our conceptual development.

RESULTS

Table 1 reports the descriptive statistics and the correlations at the within-person level. As a preliminary step in the analysis, partitioning of the variance indicated that 57% of the variance in abusive supervision was within-supervisors, and 54% of the variance in work engagement was within-work units (i.e., the work unit-day level of analysis). Table 2 reports the results of our hypotheses and the multilevel path analysis. We proposed that daily leader sleep quantity (H1a) and sleep quality (H1b) will be negatively related to leader ego depletion. Results provided support for H1b: daily sleep quality ($\gamma = -.13$, $p < .05$) was negatively related to leader ego depletion; there was no statistically significant relationship between daily sleep quantity and leader ego depletion ($\gamma = .02$, $p > .05$).

Hypothesis 2, which posited that daily leader ego depletion positively relates to daily abusive supervision, received empirical support ($\gamma = .35$, $p < .01$). Hypothesis 3 posited that daily leader ego depletion will mediate the relationship between daily sleep quantity (H3a) and daily sleep quality (H3b) and daily abusive supervisor behavior. Hypothesis 3a was not supported. Hypothesis 3b was supported: the indirect effect of daily sleep quality on daily abusive supervisor behavior via daily leader ego depletion was significant ($ab = -.04$, $p<.05$; 95% CI [-.084, -.003]).

Hypothesis 4, which posited that daily abusive supervision will be negatively related to daily unit work engagement, was supported ($\gamma = -.45$, $p < .01$). Hypothesis 5 posited that daily leader ego depletion and daily abusive supervision will serially mediate the relationship between daily sleep quantity (H5a) and daily sleep quality (H5b) and daily unit work engagement. Hypothesis 5a was not supported but Hypothesis 5b received support: the indirect effect of daily sleep quality on daily abusive supervision via daily leader ego depletion (the first-stage

mediator) was statistically significant (*ab* = -.15, *p*<.01; 95% CI [-.229, -.080]); notably, the indirect effect of daily sleep quality on daily unit work engagement via both daily leader ego depletion (the first-stage mediator) and daily abusive supervision (the second-stage mediator) was also significant (*ab* = .02, *p*<.05; 95% CI [.000, .039]; 90% CI [.003,.036]. The estimate (*ab*) of the indirect effect for the serial mediation is statistically significant at the 5% level of significance (i.e., p<.05), and the lower bound of the 95% confidence interval is a non-zero positive value beyond the three decimal places, which, as such does not include zero. Nevertheless, as an additional check, we also report the 90% confidence interval for this indirect effect.

Overall, the results indicated that daily leader ego depletion mediated the relationship between daily leader sleep quality and daily abusive supervision. Furthermore, there was evidence of serial mediation such that the relationship between daily leader sleep quality and unit work engagement was mediated by leader ego depletion and daily abusive supervision. We did not observe these indirect effects for the daily sleep quantity and unit work engagement relationship.

Supplementary Analyses

To provide additional insight on different functional forms of abusive supervisory behaviors, we performed a number of supplementary analyses. Specifically, we considered the variability in abusive supervision (as indicated by the standard deviation of abusive supervision) and the trend in abusive supervision over the study period (as indicated by the linear trend of abusive supervision). Although we do not have any *a priori* hypotheses for these analyses, we explore them to allow the possibility of finding useful information. We focus solely on the

variables of interest in these analyses and exclude the various potential combinations of control variables.

As a first step, we examined whether abusive supervision variability is related to unit work engagement above and beyond the mean level of abusive supervision. Results indicated that abusive supervision variability was related to unit work engagement ($\gamma = .09$, $p < .10$) only at less stringent cutoff level of an alpha value of .10. Next, to understand whether units may react to the same daily abusive supervision differently depending on the predictability of the behavior, we examined abusive supervision variability as a moderator of the abusive supervision – unit work engagement relationship (see Table 3). Results indicated that abusive supervision variability may play such a moderating role ($\gamma = .13$, $p < .10$) such that unit work engagement was highest when both mean and variability in abusive supervision were low, albeit again only at a less stringent alpha cutoff level (see Figure 2).

In a third exploratory analysis we examined the trend in abusive supervision as a predictor of unit work engagement to assess whether subordinates respond differently if abusive supervision is getting worse (or lessening) over time (i.e., within the two-week time period of our study). There were no statistically significant effects for the trend of abusive supervision as a predictor of unit work engagement ($\gamma = -.04$, $p > .05$). In a related analysis, to assess whether units may respond to the same level of daily abusive supervision differently depending on the trend in abusive supervision, we examined the trend as a moderator of the daily abusive supervision – unit work engagement relationship. Results indicated that the moderator effects were not significant ($\gamma = -.09$, $p > .05$).

Finally, given the null findings associated with sleep quantity, we examined the interactive effects of sleep quantity and sleep quality on daily abusive supervision. Results

indicated that the interaction term was not statistically significant ($\gamma = .08$, $p > .05$). We also examined the interactive effects of sleep quantity and sleep quality on daily ego depletion, a more proximal outcome. Results indicated that the interaction term was statistically significant, although at a less stringent cutoff of an alpha of .10 ($\gamma = -.14$, $p < .10$), such that daily ego depletion was lowest when both sleep quantity and sleep quality were high.

Overall, the exploratory analyses revealed few statistically significant findings. Moreover, there was no clear and meaningful pattern that emerged from those analyses. It is plausible that a larger sample, or more specifically, data collected over a longer timeframe, may be necessary to detect trends and variability in abusive supervision, and to more clearly isolate interactive effects of sleep quantity and quality.

DISCUSSION

We used an experience sampling design to examine the daily relationships among supervisor sleep, subsequent supervisory abusive behaviors towards subordinates, and subordinate outcomes. The results generally supported our hypotheses with regards to sleep quality, but not sleep quantity. Supervisor sleep quality was associated with daily abusive behaviors through the mediator of daily ego depletion. Supervisor sleep quality was also linked indirectly—via daily leader ego depletion and daily abusive supervisor behavior—to subordinate unit work engagement. Our results have several theoretical and practical implications.

To begin, we challenge the prevailing static viewpoint that assumes that leaders are either abusive to some degree or not abusive at all. Whereas the majority of research has considered abusive supervision to be a chronic factor—much like a trait or a consistent style—our study suggests that supervisors vary in their level of abusive behavior on a daily basis. Our results stand with those of Johnson and colleagues (2012) as the only two studies that have tested this

approach. Our findings add to the literature by suggesting that in order to accurately describe abusive supervision, theory and research should focus as much on "momentary" abuse as it has on "sustained" abuse. Thus our research moves the literature on abusive supervision, and on leadership more generally, forward by demonstrating the importance of a daily perspective in understanding leader behavior.

Further, our results suggest at least two reasons why fluctuations in abusive behavior are theoretically important. First, daily abusive behaviors are associated with fluctuations in supervisor sleep quality. This is unlikely to be found in a between-subjects research design, because the effects of nightly sleep quality are proximal and most likely to have effects on behavior the following day. More generally, by linking sleep to leader behavior, we contribute to the very small body of research on antecedents to abusive supervision, arguing that the exogenous causes of abusive supervision may vary on a daily basis. Our study explains one reason why leaders exhibit inconsistency in their abusive behaviors, filling a critical gap in our understanding of the reasons why managers may be abusive (cf. Tepper, 2007; Tepper, et al., 2011).

In addition to examining antecedents, our results suggest a connection between the non-work domain of leaders and the work domain of subordinates, supporting our hypothesis that, at the day-level, a supervisor's sleep quality impacts subordinate outcomes indirectly by increasing supervisors' daily abusive behaviors. The finding that daily abusive supervisor behavior leads to detrimental subordinate outcomes on a daily basis is in contrast to other studies of the outcomes of abusive supervision, which have focused exclusively on differences between individuals' emotions, attitudes, and behaviors (see Schyns & Schilling, 2013). As such, our study demonstrates how a daily perspective enables tests of subordinate reactions to abuse from a

within-person vantage. This has clear implications for negative spillover processes (Eby, Maher, & Butts, 2010), in which difficulties outside of the work domain can negatively impact work experiences. In this case, poor sleep quality outside of work negatively influences leader behavior toward subordinates.

Moreover, our findings that leader sleep has an indirect effect on daily work unit engagement highlight an important "crossover" process that might have long-term downstream outcomes for organizations and employees. For organizations, workers who are disengaged on any given day will have lower job performance (Rich, LePine, & Crawford, 2010) which can affect the quality of work output by the organization. A single day of work can represent a sizeable amount of value for an organization. Imagine if a supervisor's employees disengaged entirely from work for a single day. Subtracting weekend (or alternative days off), holidays, vacation time, and sick days, full-time employees will typically work somewhere between 220 and 240 days per year. Thus, even a single day of work represents somewhere around half of a percent of the full value that employee brings for a year. Given that there is considerable daily variance in each of the outcomes we study, it is reasonable to expect that there can be many days in a given year in which a supervisor suffers a poor night of sleep, is high in abusive supervision the next day, and elicits disengagement from his/her subordinates. Obviously, exact amounts are difficult to estimate, given that these constructs vary continuously and that there are also between-individual differences that also influence these frequencies. Nevertheless, we posit that lost value from disengagement on a given day can represent considerable amounts of lost value to organizations. This becomes even more apparent when one begins to aggregate across many such days of low work unit engagement, many work units, many organizations, and many years,

or when one examined high reliability contexts in which a moment of disengagement can produce disastrous consequences.

Our study also contributes to research on sleep in organizations in several ways. Using an ego depletion framework, we theorized that sleep would affect leadership behaviors, a relationship that has not previously been proposed. Moreover, we respond to calls to "focus more directly on sleep quality in addition to sleep quantity" (Barnes, et al., 2011, p. 178), given results indicating that sleep quality may play an important role in determining behavior (Barnes, et al., 2011) and attitudes (Scott & Judge, 2006) in the workplace. In our study, sleep quality—the difficulty of falling asleep and staying asleep (Barnes, 2012)—emerged as an explanatory variable. This finding is important because it adds to the range of factors relating sleep to workplace dynamics. Barnes further notes that sleep quantity and quality have parallel additive effects on self-regulation.

Although we predicted such parallel effects, the effects for sleep quantity were generally not supported. It is possible that this is simply the result of sampling error, but this is difficult to assess. The *p* values for sleep quantity were not close to conventional cutoffs, indicating that there would have had to be considerable levels of such sampling error to create a Type II error. An alternative possibility is that supervisors are more aware of their sleep quantity than quality, and are more carefully monitoring their behavior after low sleep quantity but not poor sleep quality. Another possibility is that chronic sleep deprivation may be more powerful than acute sleep deprivation in predicting abusive supervision. Although we do not have any measures of chronic sleep deprivation, future research may do well do examine this question. Moreover, there is some evidence in the extant literature of a possible threshold effect with quantity. Christian and Ellis (2011) found a difference between those above and below 6 hours of sleep, and in our

sample we found that only 13 percent of the observations of supervisor sleep quantity achieved this level of deprivation. This may have limited our ability to explain variance in abusive supervision by restricting the range of the independent variable. Further, sleep quality is a variable that might be subject to more variation than quantity.

Limitations and future research

Despite the strengths of our methodology—we collected data over time from the separate sources of subordinates and supervisors—helping us to avoid inflated correlations commonly found in same-source data (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), our study has several limitations. We did not manipulate variables or use random assigment techniques, which would enable more clear causal inferences. Instead, we rely on our theory, the time-separated nature of our daily assessments, and a within-participant design that partials out any between-participant differences in order to test our hypotheses specifying directional relationships. Although we control specifically for supervisor trait anxiety, and use a design that parses out any potential between-supervisor confounds, we did not include an exhaustive list of day-level controls. We encourage future research to include such day-level control variables, perhaps starting with the most conceptually relevant, such as supervisor day-level workload, supervisor day-level stress, and supervisor day-level health and well-being related variables.

Because the focus of our research was on supervisor sleep, we did not examine the effects of subordinate sleep (either as predictors or consequences), despite some compelling theoretical possibilities that can be addressed in future studies. Niedhammer, David, Degioanni, Drummond, and Philip (2009) found that the experience of workplace bullying was associated with sleep disturbance. Given the conceptual overlap between workplace bullying and abusive supervision, it may well be that daily abusive supervisor behavior would lead to sleep difficulties that night

for subordinates. Indeed, Rafferty, Restubog, and Jimmieson (2010) found more directly that abusive supervision is associated with subordinate insomnia. Thus, researchers could examine the relationship between subordinate and supervisor sleep quantity and quality. These relationships could be modeled as having lagged crossover effects (Eby et al., 2010), with causal effects emerging over time, as one role's lack of sleep crosses over to the other. Supervisor sleep might have effects on subordinate sleep or vice versa, because it is possible that tired and fatigued employees lead coworkers to experience stress that is disruptive to their subsequent sleep patterns. Alternatively, the relationship between supervisor and subordinate sleep might be modeled as an interaction effect. Tired leaders working with tired subordinates could result in a particularly toxic combination. Subordinate deviance and unethical behavior are the results of both lack of subordinate sleep (e.g., Barnes et al., 2011; Christian & Ellis, 2011) and abusive supervision (e.g., Tepper, Henle, Lambert, Giacalone, & Duffy, 2008). Thus, it is quite possible that the result of lack of sleep in the supervisor-subordinate dyad could exacerbate the tendency towards deviance for the subordinate.

Despite a growing body of work that supports an ego-depletion view of sleep and resulting effects on antisocial or unethical behaviors (e.g., Barnes et al., 2011; Christian & Ellis, 2011), a recent study has shown, by manipulating sleep and ego depletion, that these effects may not consistently hold (Vohs, Glass, Maddox, & Markman, 2011). Vohs and colleagues' work suggests that the effects of ego depletion on aggressive behavior hold across sleep-deprivation conditions, and thus ego-depletion might be differentiated from fatigue induced by suboptimal sleep. Future research might be conducted to try to untangle the differences and similarities between sleep's effects on fatigue and ego depletion. Also, as Vohs and colleagues point out, it is possible that self-report measures of depletion are more likely to capture variance associated

with people's lay beliefs about the effects of sleep on self-control. Although this is a question perhaps best addressed by controlled laboratory research, future field studies that expand on our results might benefit from measuring self-control depletion by developing and using behavioral measures.

Another potential area for future research would be individual differences that would moderate the effects of leader sleep on daily abusive supervisor behavior. Our model focuses on the causal mechanism of ego depletion, from a perspective of self-control. However, future research may find that individual differences in trait self-control play an important moderating role; for leaders who are dispositionally high in trait self-control, they may manifest a weaker relationship between sleep and abusive supervision, whereas the relationship may be stronger for those low in trait self-control. Similarly, leader agreeableness and emotional stability may play moderating roles. Moreover, future research should also include other potential predictors of the daily subordinate outcomes of unit work engagement. Not only are such antecedents relevant in predicting these outcomes, but some may also play a moderating role of the effects of daily abusive supervisor behavior on subordinate outcomes.

In our exploratory analyses, we found a preliminary indication that one potential individual difference moderator to consider for further study is the consistency of the behavior of the leader. We found a marginally significant interaction, such that subordinates are hesitant to heavily engage in their work if their leaders are highly variable in abusive supervision, even if the supervisor is not being abusive on a given day. Perhaps such subordinates are waiting for the other shoe to drop, in that they might expect the leader's behavior to become abusive at any moment. Although we are reluctant to infer conclusively from this exploratory analysis, we hope that future research follows up on this idea both conceptually and empirically.

Future research should extend our model to other workplace outcomes and over other periods of time. Our initial work focuses on daily work unit engagement. However, there are potentially many other outcomes that could be impacted by leader daily sleep and daily abusive supervisor behavior, to include attitudes, psychological safety, turnover intentions, perceived supervisor support, and subordinate stress and strain. Moreover, examining the effects over different durations of time could help to identify effects yet to be uncovered. All of the constructs in our model, including abusive supervision (to more clearly isolate differences between momentary versus sustained abuse), can be examined on a longer timescale, considering average differences between people, which would be relatively stable. For example, we focused on daily variation in sleep, which influences daily variation in the other constructs in our model. However, future research could also examine chronic sleep deprivation or chronic insomnia, and how this might influence between-leader differences in abusive supervision. Whether to focus on the momentary or sustained aspects of abusive supervision should be driven by the research question and the nature of the variation of other constructs in a given model.

Finally, future research should delve deeper into the causal steps suggested by our model. Although we already present a model with a mediational chain, future research should examine the processes underlying each of these links and fill in greater detail in order to further enhance our understanding of how these relationships play out. For example, it may be that subordinate psychological safety or emotions mediate the relationship between abusive supervision and work unit engagement.

Practical implications

Our study also makes several contributions to practice. By focusing on the antecedents to daily abusive supervisor behavior, we offer important guidelines to organizations interested in

limiting abusive behaviors among supervisors at work. Our daily approach towards supervisory behavior has implications for management practice, and possesses distinct advantages over more traditional static approaches. For example, static approaches assuming that leaders are consistently abusive imply selection or termination as the only effective methods by which abusive supervision can be curbed: abusive managers are abusive, through and through. However, our study suggests that the rate of abusive behavior is related to exogenous daily factors such as sleep. Our sleep framework suggests that within-persons interventions to aid sleep will lead to lower levels of abusive supervision behavior the next day. Indeed, treating abusive supervision on a given day may be much less intimidating and much more manageable than preventing all occurrences of abusive supervision in a between-persons approach.

The finding that abusive behavior varies daily suggests that certain factors, including and in addition to sleep, might lead to rises and falls in abusive supervision. Leaders should thus be aware of their own abusive "triggers." For example, they can attempt to delay important interactions or decisions on days when they have a poor night of sleep the night before. Through leadership training, organizations can increase awareness of the connections that we observed in our research, by helping leaders to connect the dots between their sleep, their abusive behavior towards subordinates, and resulting subordinate hostility and attitudes. In customer service organizations, cultivating a clear understanding of the relationship between a leader's behavior and resulting subordinate hostility could have positive effects on customer perceptions of service quality and emotional delivery. Moreover, subordinates can learn from our results as well—it is advisable that a subordinate refrain from behaviors that could instigate an abusive episode, if they are aware that their manager has slept poorly.

Research has begun to uncover strategies for managing sleepy employees that could potentially apply to leaders in a manner that would decrease levels of abusive supervisor behavior. Barnes (2011), Caldwell (2012), and Caldwell, Caldwell and Schmidt (2008) summarize some of these strategies. Research conducted by Welsh et al. (2014) suggests that consuming caffeine might help mitigate the effects of poor sleep on ego depletion and susceptibility to following unethical instructions from an authority figure. It is possible that caffeine could play a beneficial role for tired supervisors and help to reduce their propensity for abusive behaviors. Finally, recent research by Lanaj et al. (2014) indicates that eliminating smartphone use late at night can additionally help employees sleep better. Thus, boundary work that establishes off-hours for smartphones and work email should help with the effects of sleep on daily abusive supervisor behavior.

Conclusion

In conclusion, our study connects leader sleep quality to daily abusive supervisor behavior, which ultimately results in deleterious outcomes for subordinates. Organizations wishing to create positive work environments for their workforce should take note of the importance of considering the effect of daily events, both non-work (e.g., sleep) and during work (e.g., abusive supervision behavior) as precursors to important motivational factors such as unit work engagement. Our study shows that abusive supervision varies within-person, not just between person, creating a complicated—but increasingly complete—picture for organizational scholars, managers, and workers.

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Table 1: Descriptives and Correlations

	Mean	SD	1	2	3	4
1. Daily Sleep Quality	-8.29	14.23	-			
2. Daily Sleep Quantity	435.59	70.73	.18	-		
3. Daily Leader Ego Depletion	1.82	.83	-.13	-.03	-	
4. Daily Abusive Supervision	1.58	.55	.13	.01	.33	-
5. Daily Unit Work Engagement	3.06	.87	-.04	.03	-.35	-.52

Notes. N = 606.
Correlations greater than |.12| are statistically significant at $p < .05$, two-tailed

Table 2: Multilevel Path Analysis Results

	Ego Depletion	Abusive Supervision	Unit Work Engagement
Main Effects			
Supervisor Trait Anxiety	-.08	-.05	.03
Sleep Quality	-.13*	.19**	-.02
Sleep Quantity	.02	-.01	.02
Ego Depletion		.35**	-.19**
Abusive Supervision			-.45**
R-sq	.02	.14	.30

Indirect Effects	*Estimate*	*LLCI*	*UCLI*
Sleep Quality➔Abusive Supervision (via Ego Depletion)	-.04*	-.084	-.003
Sleep Quantity➔ Abusive Supervision (via Ego Depletion)	.01	-.036	.050
Ego Depletion➔ Unit Work Engagement (via Abusive Supervision)	-.15**	-.229	-.080
Sleep Quality➔ Unit Work Engagement (via Ego Depletion & Abusive Supervision)	.02*	.000	.039
Sleep Quantity ➔ Unit Work Engagement (via Ego Depletion & Abusive Supervision)	-.00	-.022	.016

Notes. N = 606. LLCI = lower level of the 95% confidence interval. UCLI = upper level of the 95% confidence interval. The model was estimated simultaneously. Standardized estimates are reported.

* $p < .05$, ** $p < .01$, two-tailed.

Table 3: Exploratory Analysis of Abusive Supervision Variability as a Moderator

	Unit Work Engagement		
	Model 1	Model 2	Model 3
Supervisor Trait Anxiety	.10	.04	.04
Abusive Supervision Variability	-.25**	.09†	.01
Abusive Supervision		-.66**	-.64**
Abusive Supervision X Abusive Supervision Variability			.13†
R-sq	.07	.39	.40
Δ *R-sq*		.32	.01

Notes. N = 606. † $p<.10$, * $p < .05$, ** $p < .01$, two-tailed. Standardized estimates are reported.

Figure 1: Conceptual Model

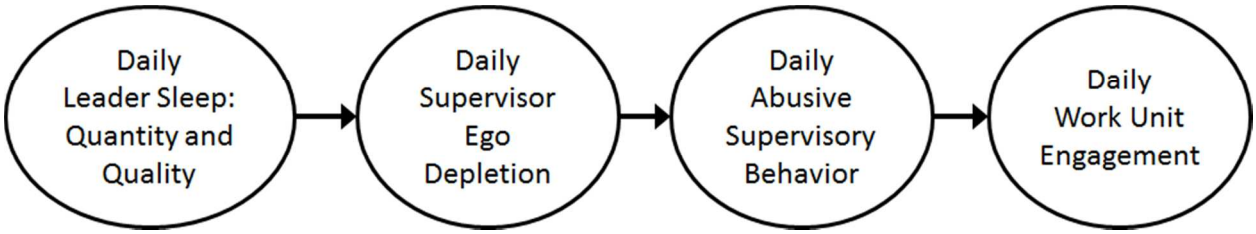
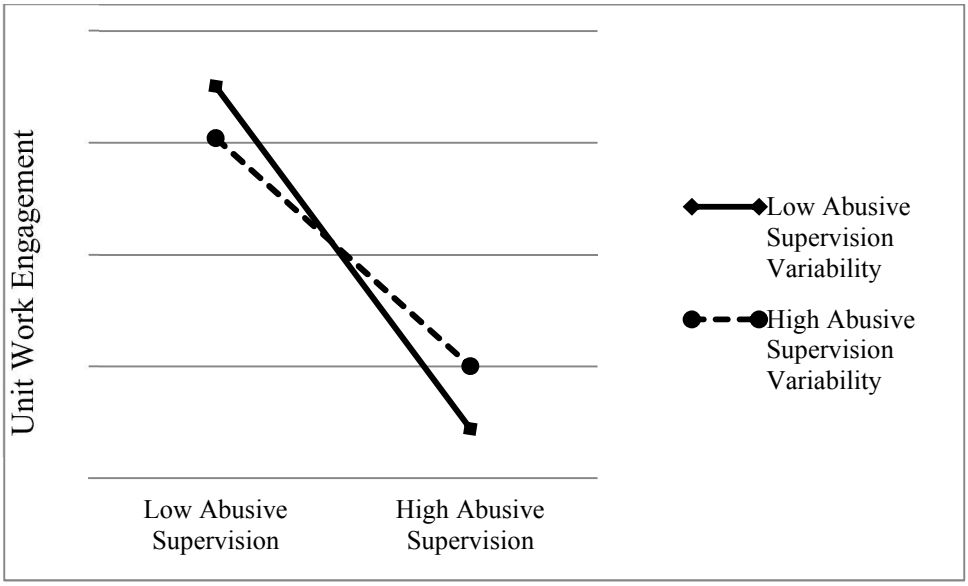


Figure 2: Exploratory Analysis of Abusive Supervision Variability as a Moderator



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