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Caitlin A. Demsky  
*Oakland University*

Charlotte Fritz  
*Portland State University, fritzcc@pdx.edu*

Leslie B. Hammer  
*Portland State University, hammerl@pdx.edu*

Anne E. Black  
*USDA Forest Service, Rocky Mountain Research Station*

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# Workplace Incivility and Employee Sleep: The Role of Rumination and Recovery Experiences

Caitlin A. Demsky  
Oakland University

Charlotte Fritz  
Portland State University

Leslie B. Hammer  
Portland State University and Oregon Health &  
Science University

Anne E. Black  
USDA Forest Service, Rocky Mountain Research Station,  
Missoula, Montana

This study examines the role of negative work rumination and recovery experiences in explaining the association between workplace incivility and employee insomnia symptoms. Drawing on the perseverative cognition model of stress and the effort–recovery model, we hypothesize a moderated mediation model in which workplace incivility is associated with insomnia symptoms via negative work rumination. This indirect effect is proposed to be conditional on employees' reported level of recovery experiences (i.e., psychological detachment from work and relaxation during nonwork time). In examining this model, we further establish a link between workplace incivility and sleep and identify one pathway to explain this relationship, as well as resources that may be used to halt the negative spillover of workplace incivility on sleep. Based on a sample of 699 U.S. Forest Service employees, we find support for a moderated mediation model in which the association between workplace incivility and increased insomnia symptoms via increased negative work rumination was weakest for employees reporting high levels of recovery experiences during nonwork time. Findings from the current study contribute to our understanding of why workplace incivility is associated with nonwork outcomes, as well as point to implications for interventions aimed at promoting employees' recovery from work.

*Keywords:* workplace incivility, negative work rumination, psychological detachment, relaxation, sleep quality

Estimates suggest that workplace incivility is on the rise—in 1998, one study found that nearly half of the employees surveyed reported being treated rudely at work at least once a month (Porath, 2015). By 2011, those numbers had increased to 55%, and to 62% by 2014 (Porath, 2016). Some estimates suggest that as many as 98% of U.S. employees have experienced uncivil behavior in the workplace (Porath & Pearson, 2013). Victims of incivility are more likely to decrease their work effort, organizational commitment, and the amount of time spent at work, all of which have implications for organizational performance. Although several

studies have indicated a range of negative outcomes associated with workplace incivility (Hershcovis, 2011; Pearson, Andersson, & Porath, 2000; Schilpzand, De Pater, & Erez, 2016), much less is known regarding the mechanisms through which workplace incivility negatively influences both work and nonwork outcomes. There also remains a lack of understanding regarding resources that can mitigate the harmful effects of workplace incivility. We chose to examine the association between workplace incivility and sleep in the current article, as organizational researchers have begun to increasingly examine sleep as a critical component of

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Caitlin A. Demsky, Department of Management & Marketing, Oakland University; Charlotte Fritz, Department of Psychology, Portland State University; Leslie B. Hammer, Department of Psychology, Portland State University and Oregon Institute of Occupational Health Sciences, Oregon Health & Science University; Anne E. Black, USDA Forest Service, Rocky Mountain Research Station, Missoula, Montana.

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Correspondence concerning this article should be addressed to Caitlin A. Demsky, Department of Management & Marketing, Oakland University, 275 Varner Drive, Rochester, MI 48309-4485. E-mail: [cademsky@oakland.edu](mailto:cademsky@oakland.edu)

employee well-being and performance (i.e., decision-making and safety; Barnes, 2012; Litwiller, Snyder, Taylor, & Steele, 2017; Wickens, Hutchins, Laux, & Sebok, 2015). The current study seeks to (a) establish an association between workplace incivility and insomnia symptoms, one indicator of sleep quality; (b) understand the mechanisms through which this association occurs; and (c) demonstrate how engaging in nonwork recovery experiences—namely, psychological detachment from work and relaxation—can mitigate the association between workplace incivility and insomnia symptoms.

Workplace incivility has been described as “low-intensity deviant behavior with ambiguous intent to harm the target, in violation of workplace norms for mutual respect” (Andersson & Pearson, 1999, p. 457). Workplace incivility affects a range of employee and organizational outcomes, including reduced job satisfaction, psychological well-being, physical well-being, and affective commitment, as well as increased turnover intentions, stress, work-to-family conflict, and counterproductive work behavior (Hershcovis, 2011; Schilpzand et al., 2016; Welbourne & Sariol, 2017).

To date, the majority of research on workplace incivility has focused on identifying antecedents (Hershcovis et al., 2007) and outcomes (Hershcovis & Barling, 2010) of incivility. Far less work has been done to explain *why* workplace incivility is associated with detrimental outcomes (Schilpzand et al., 2016). From the perspective of both researchers and practitioners, it is critical to identify these mechanisms because they may serve as potential targets for workplace interventions. Similarly, although a number of studies have examined the link between workplace incivility and health-related outcomes, far fewer have explored sleep as an outcome. Identifying workplace predictors of employee sleep is particularly important because sleep plays a critical role in how employees interpret information and behave at work (Budnick & Barber, 2015). In the current study, we focus on negative work rumination as one mechanism that may explain the association between workplace incivility and insomnia symptoms.

Rumination refers to a preoccupation with and repetitive thoughts of an event or common theme (Martin & Tesser, 1996). In the current study, we focus specifically on negative work rumination, which refers to a preoccupation with earlier negative work experiences and an inability to switch off from work-related thoughts (Cropley, Michalianou, Pravettoni, & Millward, 2012; Frone, 2015), and which may occur during nonwork hours. Negative work rumination has been associated with several health problems, including cardiovascular diseases, negative mood, and sleep disturbances (for a review, see Cropley & Zijlstra, 2011). It has also been identified as a mechanism explaining the relationship between several work stressors and strain outcomes, including negative work experiences and alcohol use (Frone, 2015); effort-reward imbalance, time pressure, and sleep (Berset, Elfering, Lüthy, Lüthi, & Semmer, 2011); and work-family conflict and health (Davis, Gere, & Sliwinski, 2016).

Whereas negative work rumination represents a continued preoccupation with work events, recovery from work presents an opportunity for employees to separate themselves from the work context. Research on recovery from work during nonwork time (i.e., experiences that allow for the halting of resource loss and rebuilding of internal resources) has identified psychological detachment and relaxation as key experiences associated with improved well-being. Psychological detachment refers to the process of mentally and physically separating oneself from work demands

(Etzion, Eden, & Lapidot, 1998). Research has linked a lack of psychological detachment to a number of work- and well-being-related outcomes, including increased strain, burnout, and reduced life satisfaction (for a recent review, see Sonnentag & Fritz, 2015). Although experiences such as workplace incivility have been associated with reduced psychological detachment (Demsky, Ellis, & Fritz, 2014; Volmer, Binnewies, Sonnentag, & Niessen, 2012), psychological detachment has also been shown to buffer the association between various job demands (e.g., time pressure, work hours, and workload) and strain outcomes, including fatigue, burnout, and depression (Sonnentag, Binnewies, & Mojza, 2010; Sonnentag & Fritz, 2015).

Relaxation is a state of low activation and higher levels of positive affect (Stone, Kennedy-Moore, & Neale, 1995). Activities such as yoga, mindful breathing, and taking a walk may all result in relaxation. Relaxation has been associated with higher levels of positive mood and vigor and lower levels of negative mood and exhaustion (Fritz, Ellis, Demsky, Lin, & Guros, 2013; Sonnentag, Binnewies, & Mojza, 2008). It has also been linked to fewer health complaints, depressive symptoms, and sleep problems and a lower need for recovery, as well as higher life satisfaction (Sonnentag & Fritz, 2007).

Previous research has indicated that the impacts of incivility may depend on the source from which incivility is experienced—namely, supervisors, coworkers, or outsiders (i.e., customers). Though researchers have called for the distinction of these sources in research, practical considerations often limit the ability to collect such data. Findings from Hershcovis and Barling (2010) suggested such distinctions are worth identifying, as they can help to make more specific, targeted practical recommendations for employees and employers alike. In line with calls to differentiate sources, the current study examines both supervisor- and coworker-initiated workplace incivility. Although these distinctions provide practical and theoretical value, we do not make differential hypotheses as to their effects in our study, given that previous research has not found differential effects of incivility when examining health-related outcomes (Hershcovis & Barling, 2010). We examine effects from both sources to provide a more detailed examination of the potential source-related effects of incivility on employee insomnia as a health-related outcome.

In sum, the current research fills three specific gaps in the literature surrounding workplace incivility and recovery from work. First, little is known regarding the mechanisms through which workplace incivility is associated with nonwork outcomes such as sleep. This study seeks to address this limitation by identifying negative work rumination as one such mechanism. Second, the current study identifies two recovery experiences—namely, psychological detachment and relaxation—as moderators that may buffer the negative relationship between incivility and employee sleep. Finally, we answer repeated calls to distinguish the source of workplace incivility by comparing the relationships of both supervisor- and coworker-initiated workplace incivility with employee outcomes. In doing so, we identify potential avenues for employee- and organization-focused interventions.

## Theoretical Background

### Perseverative Cognition Model of Stress

Perseverative cognition refers to the degree to which an individual continually recalls a past experience (words, gestures, etc.),

such as when a victim of workplace incivility replays the act of incivility in their mind long after the workday has concluded (Brosschot, Pieper, & Thayer, 2005). The perseverative cognition model of stress proposes perseverative cognition as one mechanism through which stress is linked to strain, and in particular, somatic symptoms and eventual disease. Rumination is one way to measure perseverative cognition, in that an individual may find it difficult to stop thinking about a past event or may be anticipating a future event—in this case, incidents of workplace incivility.

Evidence suggests that forms of perseverative cognition, including worry and rumination, can explain the link between prolonged effects of stressors on strain outcomes. Specifically, exposure to stressors is associated with increased perseverative cognition, which is in turn associated with increases in strain outcomes. Brosschot, Verkuil, and Thayer (2010) reviewed a number of these findings, which showed that worry or rumination can slow down both cortisol and cardiovascular recovery. In one study, worrying explained the relationship between stressors and cardiac activity during waking as well as sleeping (Brosschot, van Dijk, & Thayer, 2007). In line with this model and its supporting research, we identify negative work rumination as one such mechanism explaining the association between workplace incivility and reduced sleep quality.

**Effort–Recovery Model**

The effort–recovery model posits that acute load reactions (e.g., increased blood pressure and affective distress) to work demands will over time develop into more chronic load reactions in the event of incomplete recovery opportunities (Geurts & Sonnentag, 2006; Meijman & Mulder, 1998). Recovery occurs when work demands are no longer present and employees’ psychophysiological systems are allowed to return to prestressor levels. Sonnentag and Fritz (2007) suggested that psychological detachment and relaxation during nonwork time are two such recovery experiences that allow systems to return to prestressor levels after the removal of work demands. Several activities have been suggested as fostering these recovery experiences, including exercise, volunteering, meditation, taking a walk, and listening to music.

In the current study, negative work rumination may represent a pathway in which a preoccupation with work demands (e.g., workplace incivility) during nonwork time prevents one’s psychophysiological systems from returning to baseline. Whereas, psychological detachment and relaxation may serve as an opportunity to halt the negative spillover process (i.e., when effects of work and family produce similarities between the two domains; Edwards & Rothbard, 2000), thereby allowing employees to recover. Research

on recovery training programs (Hahn, Binnewies, Sonnentag, & Mojza, 2011) suggested that employees may be able to engage in recovery during nonwork time even in the face of work stressors. Drawing on both the perseverative cognition model of stress and the effort–recovery model, we propose a model in which the indirect effect of workplace incivility on insomnia symptoms via negative work rumination is conditional on recovery experiences. Specifically, we investigate whether the indirect effect of workplace incivility on insomnia symptoms is weaker for employees who engage in higher levels of recovery experiences. The full proposed model can be seen in Figure 1.

**Workplace Incivility, Negative Work Rumination, and Insomnia Symptoms**

Workplace incivility suggests a violation of social norms of civility and can leave victims questioning their place in the organization and reflecting on the experience long afterward (Pearson et al., 2000). Workplace incivility has been linked to rumination in both victims (Shapiro, 2013) and bystanders (Porath, MacInnis, & Folkes, 2010), as well as decreased psychological detachment from work during nonwork time (Demskey et al., 2014; Nicholson & Griffin, 2015; Volmer et al., 2012). In a recent experimental manipulation, experiencing incivility from a team member was associated with increased self-blame and, in turn, higher levels of rumination, particularly for those who experience incivility without witnesses (Schilpzand, Leavitt, & Lim, 2016). In line with the perseverative cognition model of stress, we posit that workplace incivility is one job stressor that may activate prolonged or repetitive thinking about work-related events after work has ended (i.e., negative work rumination).

*Hypothesis 1:* (a) Supervisor and (b) coworker incivility is associated with increased negative work rumination.

In addition to associations with cognitive outcomes such as rumination, workplace incivility may also directly affect the quality of one’s sleep. Limited research has examined associations between incivility and sleep, though some support has been found for this relationship (Bayne, 2015; Holm, Torkelson, & Bäckström, 2015; Oore et al., 2010; Yamada, 2000). Generally, workplace incivility has been associated with negative impacts on broad measures of physical health (Lim, Cortina, & Magley, 2008). Workplace bullying, a more extreme form of workplace incivility, has been associated with poor sleep quality (Magee et al., 2015; Nabe-Nielsen et al., 2016; Niedhammer et al., 2009; Takaki et al., 2010), whereas at least one qualitative study has also linked

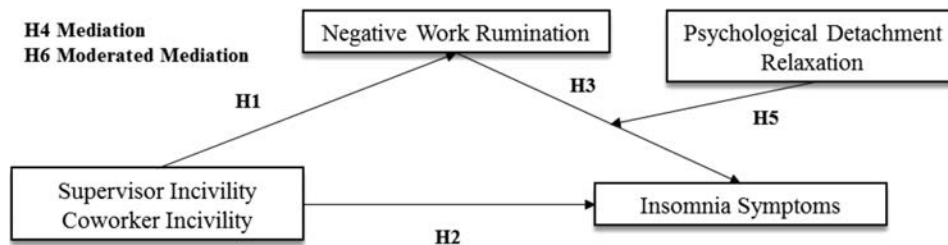


Figure 1. Hypothesized model.

workplace aggression to disturbed sleep (Glomb, 2002). Job demands more generally have been associated with reduced sleep quality (De Lange et al., 2009; Litwiller et al., 2017; Van Laethem, Beckers, Kompier, Dijksterhuis, & Geurts, 2013), so it also stands to reason that workplace incivility would be associated with reductions in sleep quality. In the current study, we examine insomnia symptoms as an indicator of poor sleep quality. Insomnia symptoms include difficulty falling asleep, difficulty maintaining sleep, or experiencing nonrestorative sleep (Jenkins, Stanton, Niemczyk, & Rose, 1988).

*Hypothesis 2:* (a) Supervisor and (b) coworker incivility is positively associated with insomnia symptoms.

Negative work rumination represents an inability to “let go” of work events after the work day is over, and as such may impair one’s ability to sleep soundly at night. Both theory and previous empirical work suggest that negative work rumination may serve as a link between workplace incivility and poor sleep quality. Relevant to the current study, work-related rumination has been associated with reduced sleep quality, including insomnia and longer time to fall asleep (Guastella & Moulds, 2007; Querstret & Copley, 2012; Thomsen, Mehlsen, Christensen, & Zachariae, 2003; Vahle-Hinz, Bamberg, Dettmers, Friedrich, & Keller, 2014; Watkins, 2008). Both trait- and stressor-specific rumination have also been linked to longer time to fall asleep (Zoccola, Dickerson, & Lam, 2009). As suggested by the perseverative cognition model of stress, negative work rumination may serve as the mechanism through which job stress impairs employees’ physical health (measured here as increased insomnia symptoms). In the present study, continued cognitive activation may be expected to prevent individuals from achieving quality sleep.

*Hypothesis 3:* Negative work rumination is associated with increased insomnia symptoms.

The perseverative cognition model of stress hypothesizes that perseverative cognitions (i.e., rumination) serve as a link between stressors and strain outcomes, and research has begun to accumulate in support of this hypothesis. Perseverative cognition has been found to mediate the relationship between general work stress and sleep quality (Van Laethem et al., 2015), whereas worry, a related construct, mediates the link between workplace bullying and reduced sleep quality (Rodríguez-Muñoz, Notelaers, & Moreno-Jiménez, 2011). Related to the current study, previous research has found support for rumination as the explanatory link between workplace incivility and work-related outcomes such as performance and revenge motives (Shapiro, 2013) and between work stressors and impaired sleep (Berset et al., 2011). Related to the effort–recovery model, engaging in negative work rumination after work may call upon similar psychophysiological systems as work demands and, therefore, prevent effective recovery from occurring. In the current study, we propose that negative work rumination serves as a link between experiences of workplace incivility and insomnia symptoms.

*Hypothesis 4:* The association between (a) supervisor and (b) coworker incivility and insomnia symptoms will be mediated by negative work rumination.

## The Role of Recovery Experiences

In line with previous research examining recovery experiences as moderators, we suggest that psychological detachment and relaxation may serve as buffers of the stressor–strain relationship even after accounting for the underlying role of perseverative cognition in this process (Brosschot et al., 2005, 2010). Although some support has been found for the indirect effect of work stressors on sleep via rumination, other studies have failed to find support for this pathway (Vahle-Hinz et al., 2014), suggesting these associations may be conditional on other factors. In line with the effort–recovery model, Geurts and Sonnentag (2006) suggested that a cognitive stress-related process, including rumination, might explain the relationship between stressful work characteristics and more chronic load reactions and, further, that sufficient recovery may be able to mitigate this relationship.

Recent research has connected psychological detachment to improved sleep quality (Barber & Jenkins, 2014; Hülshager et al., 2014). At the day level, psychological detachment during the evening has been associated with less fatigue the following morning and better sleep quality (Hülshager et al., 2014; Sonnentag et al., 2008). Psychological detachment has also been identified as a moderator of the stressor–strain relationship, for example, between workplace bullying and psychological strain (Moreno-Jiménez, Rodríguez-Muñoz, Pastor, Sanz-Vergel, & Garrosa, 2009), emotional conflicts at work and poor well-being (Sonnentag, Unger, & Nägel, 2013), and daily distress at work and next-morning distress after incivility at work (Park, Fritz, & Jex, 2015). Psychological detachment is theoretically and conceptually distinct from rumination and is not the same as a lack of rumination. Whereas negative work rumination represents an active cognitive preoccupation with work events, either in an attempt to solve work problems or anticipate future work problems, psychological detachment represents an avoidance of work-related thoughts, actions, or emotions (Sonnentag & Fritz, 2007). Previous research indicated that they are also related to different outcomes—for example, rumination has been associated with increased depressed mood, whereas distraction—similar to detachment—has been associated with reduced depressed mood (Morrow & Nolen-Hoeksema, 1990). Psychological detachment can be fostered through a variety of specific activities, including exercise or spending time with family. Thus, we propose that psychological detachment will serve as a moderator of the relationship between negative work rumination and insomnia symptoms. Further, we hypothesize that the indirect relationship between incivility and insomnia symptoms via negative work rumination will be conditional on psychological detachment.

*Hypothesis 5:* (a) Psychological detachment will moderate the association between negative work rumination and insomnia symptoms, such that the association will be weaker for those who report higher levels of psychological detachment. The indirect effect of (b) supervisor and (c) coworker incivility on insomnia symptoms via negative work rumination is conditional on psychological detachment. The indirect effect is weaker for employees who report higher levels of psychological detachment.

To date, fewer studies have focused on the role of relaxation. Relaxation has been associated with increased morning serenity



and life satisfaction, fewer health complaints and sleep problems, and less exhaustion and need for recovery (Sonnetag et al., 2008; Sonnetag & Fritz, 2007). Relaxation has also been identified as a moderator of the association between work characteristics and occupational well-being, including between time demands and exhaustion (Siltaloppi, Kinnunen, & Feldt, 2009) and between job insecurity and need for recovery from work (Kinnunen, Mauno, & Siltaloppi, 2010). As suggested by the effort–recovery model, relaxation provides an opportunity for individuals to halt work-related demands, which is critical for restoring individuals to their prestressor state. In the context of this study, we hypothesize that relaxation during nonwork time will serve as a moderator of the relationship between negative work rumination and insomnia symptoms. In addition, the indirect relationship between incivility and insomnia symptoms via negative work rumination will be conditional on relaxation.

*Hypothesis 6:* (a) Relaxation will moderate the association between negative work rumination and insomnia symptoms, such that the association will be weaker for those who report higher levels of relaxation. The indirect effect between (b) supervisor and (c) coworker incivility and insomnia symptoms via negative work rumination is conditional on relaxation. The indirect effect is weaker for employees who report higher levels of relaxation.

## Method

### Participants and Procedure

After receiving approval from the authors' research ethics committee, employees of the United States Department of Agriculture (USDA) Forest Service in the Southwestern United States were recruited via e-mail to participate in the current study. Of a potential 2,256 employees, 781 accessed the survey (34.6% response rate). Of the 781 participants who accessed the survey, 699 provided usable data (31% response rate). Participants were removed from the final sample if they failed to provide any responses to the key variables examined in the current study. On average, participants were 48 years old ( $SD = 10.84$ ), with 16.67 years ( $SD = 10.12$ ) of experience with the USDA Forest Service and 6.95 years ( $SD = 6.23$ ) of experience in their current position. Females comprised 49.2% of the sample, whereas 47.2% were male (the remaining 3.6% of the respondents chose not to identify their gender). Participants identified as White (56.5%), African American (0.7%), Hispanic/Latino (13.0%), Native American (3.0%), Asian (0.3%), and Native Alaskan or Pacific Islander (0.3%). An additional 21% of the participants chose not to self-identify their ethnicity. A total of 41% of the participants classified their current jobs as supervisory, whereas 59% were in nonsupervisory positions. On average, the participants reported working 5 days a week ( $SD = 0.42$ ) and 41.77 hr per week ( $SD = 10.30$ ). Participants were employed in a variety of capacities for the Forest Service, including in resources (i.e., recreation, wildlife, and timber), wildland fire, business operations, planning, and public affairs.

### Measures

**Workplace incivility.** Workplace incivility was measured using the Workplace Incivility Scale (Cortina, Magley, Williams, &

Langhout, 2001). Seven items referred to supervisor-initiated workplace incivility, and an additional seven items referred to coworker-initiated incivility. Participants were asked to indicate how often they had been subjected to each behavior over the past 6 months on a scale ranging from 1 (*never*) to 5 (*most of the time*). An example item includes "put you down or were condescending to you." Cronbach's  $\alpha$  for this scale was .93 for both supervisor and coworker incivility.

**Negative work rumination.** Rumination was measured with five items referring to affective rumination ("the emotional experience of not being able to switch off from work related thoughts"; Cropley et al., 2012, p. 25), an example of which is "Are you troubled by work-related issues when not at work?" Response options ranged from 1 (*very seldom or never*) to 5 (*very often or always*). Participants were asked to indicate how frequently they had experienced each indicator over the past 6 months. Cronbach's  $\alpha$  for this scale was .96.

**Insomnia symptoms.** Participants responded to four items on a scale ranging from 1 (*less than once per month*) to 5 (*every day*; Jenkins et al., 1988) regarding the extent to which they experienced insomnia symptoms over the previous 6 months. An example item includes "woke up several times during the night." Cronbach's  $\alpha$  for this measure was .78.

**Psychological detachment.** Four items from the Recovery Experience Questionnaire (Sonnetag & Fritz, 2007) were used to measure psychological detachment from work. Participants were asked to indicate to what degree items reflected their free evenings over the previous 6 months on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Example items include "I didn't think about work at all" and "I distanced myself from my work." Cronbach's  $\alpha$  for this scale was .86.

**Relaxation.** Four items from the Recovery Experience Questionnaire (Sonnetag & Fritz, 2007) were used to measure relaxation. Participants were asked to indicate to what degree items reflected their free evenings over the previous 6 months on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Example items include "I kicked back and relax" and "I took time for leisure." Cronbach's  $\alpha$  for this scale was .94.

**Control variables.** For all analyses, the number of children under 18 at home and hours worked per week were controlled for because both variables have previously been associated with sleep (Krueger & Friedman, 2009; Litwiller et al., 2017), and higher numbers of hours worked per week may also be linked to increased exposure to workplace incivility. In addition, hours of work per week have been controlled for as a proxy for job demands in previous research (Nicholson & Griffin, 2015). We also controlled for frequency of alcohol use over the past 6 months with one item, "In the past 6 months, how often have you had an alcoholic drink?" (1 = *not at all*, 2 = *on occasion*, 3 = *often*, 4 = *all the time*), as previous research has identified alcohol use as one potential behavioral predictor of insomnia (Ohayon, 2002).

## Results

### Preliminary Analyses

Descriptive statistics and bivariate correlations for all study variables are reported in Table 1. In line with past research, both supervisor ( $r = -.18, p < .01$ ;  $r = -.21, p < .01$ ) and coworker

Table 1  
Means, Standard Deviations, and Correlations Among Study Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Children under 18	0.56	0.99	—								
2. Hours per week	41.77	10.30	.05	—							
3. Alcohol use	3.50	1.74	-.12**	.03	—						
4. Supervisor incivility	1.95	0.94	.05	.14**	-.03	(.93)					
5. Coworker incivility	1.85	0.83	.04	.10*	.01	.41**	(.93)				
6. Negative work rumination	2.76	1.12	.05	.14**	.08	.41**	.29**	(.96)			
7. Psychological detachment	3.10	0.95	-.05	-.13**	-.02	-.18**	-.16**	-.55**	(.86)		
8. Relaxation	3.67	0.92	-.14**	-.13**	.05	-.21**	-.21**	-.41**	.59**	(.94)	
9. Insomnia symptoms	2.65	0.98	.11*	.01	.00	.15**	.18**	.37**	-.32**	-.31**	(.78)

Note. Reliabilities (Cronbach's  $\alpha$ ) are on the diagonal in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

( $r = -.16, p < .01$ ;  $r = -.21, p < .01$ ) incivility were negatively associated with psychological detachment from work and relaxation, respectively. Psychological detachment from work,  $r = -.55, p < .01$ , and relaxation,  $r = -.41, p < .01$ , were negatively associated with negative work rumination. In turn, negative work rumination was significantly associated with insomnia symptoms,  $r = .37, p < .01$ .

Confirmatory factor analyses were conducted to justify the examination of negative work rumination and psychological detachment from work as independent constructs, as well as the examination of psychological detachment and relaxation as separate recovery experiences. Regarding the former comparison, a two-factor model,  $\chi^2(26, N = 590) = 169.55, p < .01$ , comparative fit index (CFI) = .97, root mean square error of approximation (RMSEA) = .097, in which negative work rumination and psychological detachment were distinct constructs, fit the data better than a one-factor model,  $\chi^2(27, N = 590) = 832.50, p < .01$ , CFI = .82, RMSEA = .23. Regarding psychological detachment and relaxation, a two-factor model,  $\chi^2(19, N = 567) = 200.63, p < .01$ , CFI = .95, RMSEA = .13, also fit the data better than a one-factor model,  $\chi^2(20, N = 567) = 769.99, p < .01$ , CFI = .79, RMSEA = .26. Taking all three variables into consideration, a three-factor model,  $\chi^2(62, N = 588) = 367.46, p < .01$ , CFI = .95, RMSEA = .09, provided a better fit to the data than a one-factor model,  $\chi^2(65, N = 588) = 2874.34, p < .01$ , CFI = .60, RMSEA = .27. The results of these confirmatory factor analyses indicate the appropriateness of treating negative work rumination, psychological detachment, and relaxation as empirically distinct constructs.

## Hypothesis Testing

Hypotheses 1–3 and Hypothesis 5 were tested using ordinary least squares regression models, whereas Hypotheses 4 and 6 were tested using Models 4 and 14, respectively, of Hayes's (2013) PROCESS macro in SPSS 22.0. PROCESS uses an ordinary least squares regression-based path analytic framework to estimate direct and indirect effects and allows for the estimation of moderated mediation (conditional indirect effect) models. PROCESS also provides several important statistics useful for testing mediation and conditional indirect effects, such as the index of moderated mediation, which require the combination of parameters across multiple equations (Hayes, Montoya, & Rockwood, 2017). Model

4 in this macro represents a simple mediation model (Hypothesis 4), whereas Model 14 represents a conditional indirect effects model in which an indirect effect is moderated at the b-path. Conditional indirect effects were probed for significance at  $\pm 1 SD$ , and the index of moderated mediation was examined as an additional significance test for the conditional indirect effects. A significant index of moderated mediation indicates that "any two conditional indirect effects estimated at different values of the moderator are significantly different from one another" (Hayes, 2015, p. 2). In addition to following Hayes's (2013) guidelines for testing conditional indirect effects, we also modeled our analytical approach on recently published research (Fodor, Antoni, Wiedemann, & Burkert, 2014; Li, Shaffer, & Bagger, 2015; Liu, Yang, & Nauta, 2013). Control variables included number of children under 18 living at home, hours worked per week, and frequency of alcohol consumption.

**Main effects results.** Both supervisor incivility ( $\beta = .48, t = 10.12, p < .001, \Delta R^2 = .16$ ) and coworker incivility ( $\beta = .38, t = 6.83, p < .001, \Delta R^2 = .08$ ) were significantly positively associated with negative work rumination, providing support for Hypothesis 1. Both supervisor incivility ( $\beta = .16, t = 3.53, p < .001, \Delta R^2 = .02$ ) and coworker incivility ( $\beta = .21, t = 4.23, p < .001, \Delta R^2 = .03$ ) were also significantly associated with insomnia symptoms, indicating support for Hypothesis 2. Negative work rumination was significantly associated with insomnia symptoms ( $\beta = .33, t = 9.38, p < .001, \Delta R^2 = .15$ ), providing support for Hypothesis 3.

**Mediation results.** Hypothesis 4 proposed that the association between workplace incivility and insomnia symptoms would be mediated by negative work rumination and was tested using Model 4 of Hayes's (2013) PROCESS macro. Supervisor incivility was associated with insomnia symptoms indirectly through negative work rumination (Effect = .1558,  $SE = .0247$ , lower level confidence interval [LLCI] = .1120, upper level confidence interval [ULCI] = .2085). Similar results were found for the indirect association between coworker incivility and insomnia symptoms (Effect = .1192,  $SE = .0220$ , LLCI = .0796, ULCI = .1665). Significance of indirect effects was determined via bias-corrected bootstrap confidence intervals using 10,000 bootstrap samples and 95% confidence intervals. Significance of the indirect effect is indicated when confidence intervals do not include zero. These results provide support for Hypothesis 4.

**Moderation results.** Hypotheses 5a and 6a proposed that the association between negative work rumination and insomnia symptoms would be weaker for those who experienced higher levels of psychological detachment and relaxation. Psychological detachment from work significantly moderated the association between negative work rumination and insomnia symptoms ( $\beta = -.08$ ,  $t = -2.27$ ,  $p = .02$ ), whereas relaxation also served as a moderator of this relationship ( $\beta = -.08$ ,  $t = -2.15$ ,  $p = .03$ ). These interactions show a similar pattern and can be seen in Figures 2 and 3. Under conditions of low rumination, similar levels of insomnia symptoms are seen regardless of psychological detachment (or relaxation) levels. However, under conditions of high rumination, those who experience higher levels of psychological detachment (or relaxation) report fewer insomnia symptoms. These results indicate support for Hypotheses 5a and 6a.

**Moderated mediation results.** Hypotheses 5b–c and 6b–c were tested using Model 14 of Hayes's (2013) PROCESS macro using 10,000 bias-corrected bootstrapped samples. These hypotheses proposed a conditional indirect effects model that examines whether the indirect effect of workplace incivility on insomnia symptoms via negative work rumination would be weaker for those who experienced higher levels of psychological detachment from work and relaxation (Figure 1). If the indirect effect of workplace incivility on insomnia symptoms through negative work rumination differs as a function of recovery experiences, this would indicate support for the hypothesis that recovery experiences moderate the proposed indirect effect.

As seen in Tables 2 and 3, the indirect effect of both supervisor and coworker incivility on insomnia symptoms was strongest at the lowest ( $-1 SD$ ) level of psychological detachment and relaxation and weakest for those who engaged in higher levels ( $+1 SD$ ) of psychological detachment and relaxation. To determine whether the indirect effect was contingent on psychological detachment and relaxation, we used PROCESS to calculate the index of moderated mediation. We found that the confidence intervals did not contain zero for any of the models, except one in which the indirect effect of coworker incivility on insomnia symptoms was conditional on relaxation (Table 3). In this instance, confidence intervals overlapped with zero, indicating a nonsignificant conditional indirect effect. Overall, these results provide support for Hypotheses 5b–c and 6b but fail to support Hypothesis 6c. These findings suggest that workplace incivility is linked to greater negative work rumination, which contributes to insomnia symptoms among those who report low levels of psychological detachment from work and relaxation.

**Additional analyses.**<sup>1</sup> Given that the effort–recovery model posits that recovery occurs when work-related demands are no longer present, one might also posit that psychological detachment and relaxation could moderate the indirect effect of workplace incivility on insomnia symptoms via negative work rumination at the first stage of this indirect effect (i.e., recovery experiences may moderate the link between workplace incivility and negative work rumination). We tested this model using Model 7 of Hayes's (2013) PROCESS macro in SPSS 22.0 and found that the indirect effects of supervisor and coworker incivility on insomnia symptoms via negative work rumination were not conditional on either psychological detachment or relaxation at the first stage of this indirect effect. For each of the alternative models, the confidence intervals of the index of moderated mediation contained zero

(supervisor incivility, psychological detachment: Effect: .0027,  $SE = .0163$ , LLCI =  $-.0288$ , ULCI = .0360; supervisor incivility, relaxation: Effect: .0141,  $SE = .0201$ , LLCI =  $-.0232$ , ULCI = .0566; coworker incivility, psychological detachment: Effect:  $-.0012$ ,  $SE = .0152$ , LLCI =  $-.0327$ , ULCI = .0276; coworker incivility, relaxation: Effect: .0007,  $SE = .0149$ , LLCI =  $-.0278$ , ULCI = .0320).<sup>2</sup>

## Discussion

The current study examined the indirect effect of workplace incivility on insomnia symptoms through negative work rumination and whether this indirect effect was conditional on one's level of recovery experiences. Overall, we found support for the proposed model. Specifically, workplace incivility was associated with increased negative work rumination. In turn, negative work rumination was associated with increased insomnia symptoms. Evidence suggests a mediated relationship, in which negative work rumination is one mechanism that may explain the association between workplace incivility and increased insomnia symptoms. We examined two recovery experiences—namely, psychological detachment from work and relaxation—as potential moderators of this indirect effect. Importantly, the impact of workplace incivility on insomnia symptoms through negative work rumination was found to be conditional on the recovery experiences of psychological detachment and relaxation. Generally, these indirect effects were weakest for individuals who engaged in higher levels of psychological detachment from work and relaxation. Results were similar for both supervisor and coworker incivility, with the exception of relaxation as a moderator of the indirect effect of coworker incivility on insomnia symptoms. These findings suggest several opportunities for organizational interventions aimed at reducing the negative spillover of workplace incivility and promoting employee recovery from work during nonwork time, which we discuss in the following paragraphs.

## Theoretical Implications

In the current study, we conceptualized negative work rumination as a mechanism that may explain the association between workplace incivility and impaired sleep. In line with the perseverative cognition model of stress, we found support for this indirect effect, which adds to the growing body of research in support of this theory (Brosschot et al., 2005, 2007, 2010). This study extends these findings into the field of occupational health psychology and provides support for the perseverative cognition model of stress as an appropriate explanatory theory when identifying rumination or worry as a key mediator. In conceptualizing recovery experiences (i.e., psychological detachment from work and relaxation) as one way to halt the negative spillover from work to the nonwork domain, we drew on the effort–recovery model, which suggests that recovery occurs when work demands are no longer present. Our findings in support of psychological detachment and relaxation as moderators of the indirect effect of workplace incivility on insomnia symptoms via negative work rumination also provide empirical support for the conceptual model

<sup>1</sup> We thank an anonymous reviewer for this suggestion.

<sup>2</sup> Full results are available from the first author upon request.



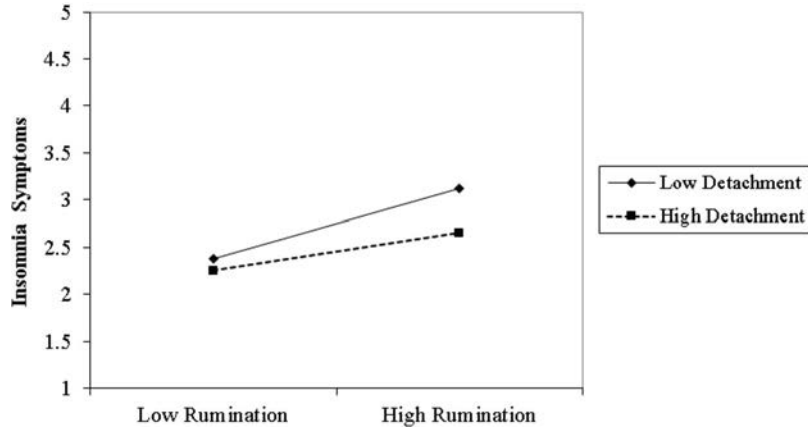


Figure 2. Psychological detachment as a moderator of the relationship between negative work rumination and insomnia symptoms.

proposed by Geurts and Sonnentag (2006), in which recovery can mitigate the negative effects of work stress on chronic health outcomes.

Finally, we add to the research on workplace incivility by examining both supervisor and coworker incivility in our present study. Associations were fairly similar across supervisor- and coworker-initiated incivility, which is in line with previous research examining health-related outcomes across sources of incivility (Hershcovis & Barling, 2010). Because well-being outcomes are more general and not organization-focused, the source may play less of a role in influencing these outcomes. Regardless of the source, employees experience incivility as a stressor, which in turn will lead to strain outcomes if sufficient recovery does not occur. In addition to these considerations, our results also suggest potential target points for reducing the negative impact of workplace incivility and subsequent negative work rumination on sleep quality.

### Practical Implications

Our study identifies the role of several conditions that impact sleep, thus providing managers with opportunities to craft poten-

tially valuable interventions. Specifically, this research supports the intuitive hypotheses that incivility in the workplace is negatively associated with sleep quality. It does so in part by stimulating people to ruminate on their negative work experiences. Those who can detach themselves mentally from this cycle fare better, that is, do not suffer as much sleep disruption as those who are less capable of detachment. It suggests a two-pronged approach to interventions: address workplace incivility (such as by raising awareness, ensuring protections and accountability, training and modeling appropriate behavior, and training supervisors on aggression prevention behaviors; Porath & Pearson, 2010; Yang & Caughlin, 2017) and improve emotional resilience skills (such as offering trainings on recovery from work and mindfulness practices, emotional/social intelligence skills, etc.; Hahn et al., 2011; Hülshager, Feinholdt, & Nübold, 2015).

Although it is important to prevent the downstream negative effects of workplace incivility, it is also critical to address and prevent the occurrence of workplace incivility. A growing body of research suggests that interventions aimed at reducing workplace incivility and promoting workplace civility can be successful (Hodgins, MacCurtain, & Mannix-McNamara, 2014). One such

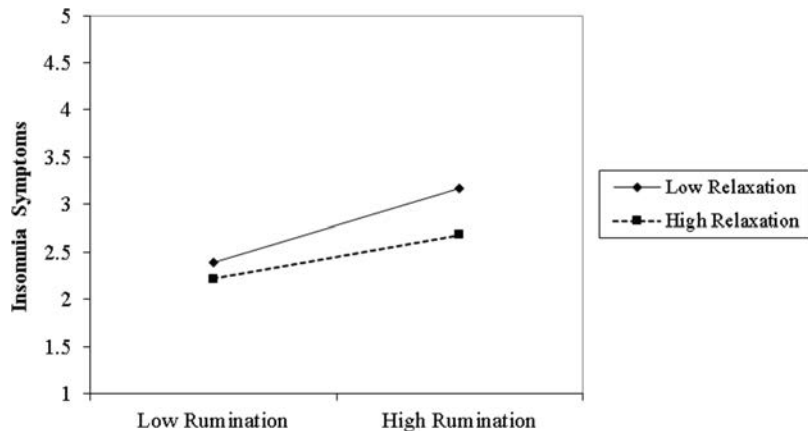


Figure 3. Relaxation as a moderator of the relationship between negative work rumination and insomnia symptoms.

Table 2  
*Moderated Mediation Results for Supervisor Incivility*

Values of moderators	Conditional indirect effect	SE	Lower CI	Upper CI
Psychological detachment				
-1 SD	.1499	.0288	.0985	.2126
<i>M</i>	.1150	.0255	.0699	.1716
+ 1 SD	.0802	.0305	.0236	.1436
Index of moderated mediation	-.0372	.0162	-.0709	-.0070
Relaxation				
-1 SD	.1599	.0287	.1083	.2220
<i>M</i>	.1284	.0242	.0860	.1807
+ 1 SD	.0969	.0284	.0459	.1590
Index of moderated mediation	-.0353	.0165	-.0692	-.0027

Note. Outcome variable: Insomnia symptoms *N* = 514–516; bootstrap sample size = 10,000. CI = confidence interval.

example is the Civility, Respect, and Engagement in the Workforce (CREW) intervention, which promotes positive and respectful interactions in the workplace, focusing on individual behaviors within a group context, while including actions that ensure management commitment (Leiter, Laschinger, Day, & Oore, 2011; Osatuke, Moore, Ward, Dyrenforth, & Belton, 2009).

Another way to improve employee and organizational performance is to increase employees' opportunities for recovery. Previous research indicated that improving resistance to and recovery from stress can measurably and positively impact performance, either through an employee's ability to perform despite stress or simply to recover more quickly and effectively (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Glomb, Duffy, Bono, & Yang, 2011; Youssef & Luthans, 2007). Positive effects of Internet-based recovery from work interventions have recently been identified, with participants reporting reduced insomnia severity and increases in the number of recovery activities per week (Ebert et al., 2015).

**Potential Limitations and Future Directions**

Although the current study offers several contributions to the workplace incivility and recovery from work literature, it is important to consider these findings in light of potential limitations. Though the current study addresses two sources of workplace incivility—coworker and supervisor—incivility may arise from other sources, such as subordinates, clients, or members of the public (Hershcovis & Barling, 2010). Although we identify relatively similar associations between supervisor and coworker incivility and our outcomes of interest in the current study, it is important for future research to consider the ways in which additional sources of incivility may affect employee outcomes such as rumination and sleep.

Common method variance is another concern, as these data were collected from employees at a single point in time, though research suggested that common method variance is typically not as high as would be expected (Spector, 2006). Further, significant interaction terms in our results suggest our findings are not due to common method variance (Siemsen, Roth, & Oliveira, 2010). In developing our theory-driven hypotheses based on previous longitudinal empirical evidence, we can increase confidence in the results of the

present study. That being said, future research will want to examine these associations longitudinally, in line with best practices for mediation research (MacKinnon, Cox, & Baraldi, 2012).

Although we controlled for several variables in our current analyses that have previously been associated with our key study variables, there are several additional variables that may warrant consideration in future research. For example, individual difference variables such as negative affectivity or emotional stability may play a key role in understanding the spillover of work stress to nonwork experiences such as recovery (Sonnentag, Arbeus, Mahn, & Fritz, 2014). Further, sleep researchers have identified a number of antecedents of insomnia, including physical pain and depression (Ohayon, 2002). Although our article offers a contribution in identifying a predictor of insomnia symptoms, future research should consider how our proposed model may play out in particularly vulnerable employee populations, such as those experiencing chronic pain and depression, who may already be susceptible to experiencing insomnia.

The sample examined in this study includes a relatively large sample of government employees from one particular federal agency. Within this sample, there is a wide range of occupations, including wildland firefighters, business operations, planning, and public affairs, which enhances the generalizability of our findings to different types of work roles. These findings may further generalize to government employees in other federal agencies, given the similar resources and challenges among the federal workforce. Given that the sample was taken from one organization, future research should replicate these findings in different organizational contexts, such as the private sector, or within smaller organizations.

One other concern may be the somewhat low response rate in our study and the potential for possible selection bias. In looking at research examining typical response rates in organizational field research, we found that a response rate of 35% seems to be fairly common. Whereas some research examining response rates in organizational field research points to higher average response rates (48.3%, with a standard deviation of 22.2%; Baruch & Holtom, 2008), other research finds lower average response rates when e-mail-only approaches to participant recruitment are used (20.7%; Kaplowitz, Hadlock, & Levine, 2004). In addition, given that our results are in line with other findings regarding workplace

Table 3  
*Moderated Mediation Results for Coworker Incivility*

Values of moderators	Conditional indirect effect	SE	Lower CI	Upper CI
Psychological detachment				
-1 SD	.1160	.0260	.0707	.1736
<i>M</i>	.0886	.0215	.0511	.1373
+ 1 SD	.0613	.0243	.0174	.1152
Index of moderated mediation	-.0292	.0139	-.0593	-.0045
Relaxation				
-1 SD	.1234	.0259	.0780	.1801
<i>M</i>	.1002	.0207	.0643	.1461
+ 1 SD	.0769	.0227	.0360	.1256
Index of moderated mediation	-.0260	.0144	-.0563	.0006

Note. Outcome variable: Insomnia symptoms *N* = 511–513; bootstrap sample size = 10,000. CI = confidence interval.

incivility, rumination, recovery from work, and sleep, we are confident that our findings are not significantly impacted by selection bias. Still, future research should aim at replicating our findings in other samples.

Future studies should separate these variables across time, including through the use of experience sampling methodology, to fully clarify the directionality of these relationships (Nicholson & Griffin, 2015). In addition, researchers should consider the use of ambulatory devices such as wrist actigraphs to objectively measure sleep outcomes (Barnes, 2012; Eatough, Shockley, & Yu, 2016). These devices use accelerometers to measure motion as a proxy for time spent awake and have been found to be valid indicators of both sleep quality and quantity. Whereas past research indicated that subjective and objective measures of sleep are strongly correlated (Barnes, Schaubroeck, Huth, & Ghumman, 2011), future research should replicate our findings using objective assessments of employee sleep outcomes.

### Conclusion

This study examined the indirect effects of workplace incivility on insomnia symptoms via increased negative work rumination and the conditional effects of recovery experiences (psychological detachment and relaxation). We largely found support for our hypotheses: Employees with the highest levels of recovery experiences (better able to detach psychologically and relax after work) sleep better, even in the face of workplace incivility. This provides empirical support for the importance of attending to workplace conditions and promoting positive affective conditions as a means to maintain and improve employee well-being and subsequent performance. Our findings contribute to the understanding of how and why workplace incivility may be associated with nonwork outcomes, as well as the role recovery may play in this process. Our study offers several practical implications, including suggestions for workplace interventions and policies aimed at reducing workplace incivility and increasing employees' ability to recover from work during nonwork time.

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