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WORKPLACE STRESS AND SLEEP QUALITY: THE DIFFERENTIAL MODERATING
EFFECTS OF PROBLEM- AND EMOTION-FOCUSED COPING

by

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B.S. Texas A&M University, 2017

A thesis submitted in partial fulfillment of the requirements
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ABSTRACT

Research on coping has provided consistent evidence that emotion-focused coping strategies tend to have negative ramifications for well-being, whereas problem-focused coping strategies tend to promote well-being. However, there is little research that examines how these two types of coping strategies impact stressor-sleep quality relationships. Therefore, the current thesis included two studies that utilized Lazarus and Folkman's (1984) conceptualization of coping as either problem-focused or emotion-focused to test the impact of those coping strategies on stressor-sleep quality relationships. The first study was cross-sectional and investigated the effect of problem-focused and emotion-focused coping on the relationship between workload and sleep quality, and the effect of emotion-focused coping on the relationship between incivility and sleep quality. Results suggested that emotion-focused coping exacerbates stressor-sleep quality relationships. The second study built upon the first study by using a daily experience sampling method design to further investigate the effects of coping on the relationship between work stress and sleep quality. In this study, sleep quality was measured subjectively with self-report measures and objectively with the use of actigraphy. Findings suggested that problem-focused coping moderated the relationship between workload and objective sleep quality, but not as expected. Together, findings across both studies suggest that emotion-focused coping and problem-focused coping may differentially moderate the relationship between work stress and sleep quality. Theoretical and practical implications are discussed.

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TABLE OF CONTENTS

LIST OF FIGURES	viii
LIST OF TABLES	ix
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: THE IMPORTANCE OF STUDYING SLEEP	5
CHAPTER 3: WORKLOAD AS A PREDICTOR OF SLEEP QUALITY	7
Hypothesis 1.....	7
CHAPTER 4: INCIVILITY AS A PREDICTOR OF SLEEP QUALITY.....	8
Hypothesis 2.....	8
CHAPTER 5: COPING CONCEPTUALIZATIONS	9
CHAPTER 6: EFFICACY OF PROBLEM-FOCUSED AND EMOTION-FOCUSED COPING STRATEGIES.....	11
Benefits of Problem-focused Coping.....	11
Hypothesis 3.....	13
Detriments of Emotion-focused Coping	13
Hypothesis 4.....	14
Hypothesis 5.....	15
CHAPTER 7: STUDY 1 METHOD.....	16
Participants and Procedure.....	16
Measures	17
Coping Strategies	17
Workload.....	17
Incivility	18
Subjective Sleep Quality.....	18
Control Variables	19
Data Analysis	19
CHAPTER 8: STUDY 1 RESULTS.....	21
Descriptive statistics	21
Main Effects.....	22
Moderation Hypotheses	22
CHAPTER 9: STUDY 1 DISCUSSION	28
CHAPTER 10: STUDY 2: DAILY ESM REPLICATION OF STUDY 1	32
Hypothesis 6a/b.....	32

Hypothesis 7a/b.....	33
Hypothesis 8a/b.....	33
Hypothesis 9a/b.....	33
Hypothesis 10a/b.....	33
CHAPTER 11: STUDY 2 METHOD.....	34
Participants and Procedure.....	34
Evening Measures Study 2.....	36
Coping.....	36
Workload.....	37
Incivility.....	37
Morning Measures.....	38
Subjective Sleep Quality.....	38
Objective Sleep Quality.....	38
Control variables.....	38
Data Analysis.....	39
CHAPTER 12: STUDY 2 RESULTS.....	41
Descriptive statistics.....	41
Within-person variability.....	43
Main effects.....	43
Moderation Hypotheses.....	44
CHAPTER 13: STUDY 2 DISCUSSION.....	49
CHAPTER 14: GENERAL DISCUSSION.....	53
Theoretical implications.....	53
Stressor-sleep quality relationships.....	53
Emotion-focused coping.....	53
Problem-focused coping.....	54
Subjective versus objective sleep-quality.....	55
Practical implications.....	56
Strengths and limitations.....	57
Future research.....	59
Conclusion.....	60
APPENDIX A STUDY 1 MEASURES.....	61
APPENDIX B: STUDY 2 MEASURES.....	64
APPENDIX C: IRB APPROVAL.....	68

REFERENCES 70

LIST OF FIGURES

Figure 1: The workload-sleep quality relationship moderated by emotion-focused coping.....	23
Figure 2: The incivility-sleep quality relationship moderated by emotion-focused coping	26
Figure 3: Example of one week of daily surveys.....	35
Figure 4: Workload and sleep efficiency moderated by problem-focused coping.	45

LIST OF TABLES

Table 1: Descriptive statistics and reliabilities study 1	21
Table 2: Correlations study 1	21
Table 3: Workload and sleep quality: Moderated by PFC and EFC.....	24
Table 4: Incivility and sleep quality: Moderated by EFC.....	27
Table 5: Descriptive statistics and reliabilities study 2.....	42
Table 6: Study 2 within persons correlations.....	43
Table 7: Workload-subjective sleep quality moderated by EFC and PFC	46
Table 8: Workload-objective sleep quality moderated by EFC and PFC.....	47
Table 9: Incivility-subjective sleep quality moderated by EFC.....	48
Table 10: Incivility-objective sleep quality moderated by EFC	48

CHAPTER 1: INTRODUCTION

The stress literature has provided overwhelming evidence that excessive work stress can result in physical, psychological, and behavioral strain for employees (Ganster & Rosen, 2013). Work stress is such a pervasive issue for organizations that the members of the Society for Industrial and Organizational Psychology (SIOP) have indicated “workforce health and well-being” as one of its top concerns in 2020 (Haynes, 2020). This concern is warranted given that the economic cost of workplace stress has been estimated at \$300 billion annually in the United States as a result of absenteeism, employee turnover, reduced productivity, legal costs, and more (Rosch, 2001; Tuckey et al., 2015).

One specific outcome of work stress that researchers have only recently started to explore is sleep. Sleep, as a physical strain, is an important outcome to study in work stress because poor sleep has been linked to accidents in the workplace (Barnes & Wagner, 2009; Dinges, 1995) and poor cognitive functioning (Barnes, 2012; Durmer & Dinges, 2005). Not only does poor sleep have severe ramifications for employees, but also monetary costs for organizations due to productivity decrements. For instance, Rosekind et al. (2010) estimated that sleep and fatigue-related productivity costs were roughly \$2,000 per employee annually. At a more macro level, Rosekind and Gregory (2010) provided an extensive review of the cost of insomnia and found that prior studies have estimated the direct economic cost of sleep quality to be between \$13-15 billion on an annual basis.

Based on the implications for well-being and economic costs of poor sleep, it is important to study the relationship between stressors in the workplace and sleep. Two widely studied stressors that may have negative repercussions for sleep are workload and incivility. Workload is defined in a variety of ways, including the amount of work, pace of work, or other qualitative

aspects such as the difficulty of work (Bowling & Kirkendall, 2012; Spector & Jex, 1998). The primary reason that workload was included in the study is that it is one of the most frequently experienced stressors across a variety of jobs and workplaces (Bowling et al., 2015; Keenan & Newton, 1985). Additionally, although there is a large body of literature that has found workload is positively related to general physical symptoms (Bowling et al., 2015), few studies have examined the relationship between workload and sleep quality.

Incivility is a type of mistreatment that is characterized by being low intensity and ambiguous in nature (Andersson & Pearson, 1999). Incivility is one of many forms of workplace mistreatment (e.g., bullying and abusive supervision) and has been extensively studied since its conceptualization by Andersson and Pearson; in fact so much so that it has been the topic of multiple review papers in the last ten years (Hershcovis, 2011; Schilpzand et al., 2016). Most studies that have examined the outcomes of incivility have examined behavioral and psychological strains (see Schilpzand et al., 2016 for a review). In comparison, little research has examined the impact of incivility on physical outcomes such as sleep. Therefore, the current study aims to answer calls in the stress literature to (e.g., Schilpzand et al., 2016) for more research that investigates physical outcomes of incivility.

In addition to studying the impact of stressors on strains such as sleep, it is also important to study the manner in which people cope with stressors and how such coping efforts influence well-being outcomes. One of the most frequently used conceptualizations of coping strategies is based on Lazarus and Folkman's transactional theory of stress (Folkman & Lazarus, 1985; Lazarus & Folkman, 1984). Lazarus and Folkman theorized that coping strategies can be differentiated based on whether or not the coping is directly aimed at mitigating the stressor (problem-focused coping) or at decreasing the negative emotions experienced as a result of the

stressor (emotion-focused coping). Research on both of these coping strategies has consistently shown that emotion-focused coping strategies are detrimental for well-being (Chang, 2012; Lewin & Sager, 2009; Sriwilai & Charoensukmongkol, 2016), whereas problem-focused coping is typically beneficial (Lewin & Sager, 2009). Drawing on the transactional theory of stress, emotion-focused coping strategies are thought to be ineffective largely because the stressor one is coping with is still present. As such, the stressor continues to be perceived by the individual, resulting in worse strain. In contrast, the use of problem-focused coping strategies reduces or alleviates the stressor and therefore results in less strain. Despite evidence that problem-focused coping is more beneficial for dealing with stress, and emotion-focused coping more detrimental, there is little research on the effects of problem-focused and emotion-focused coping strategies on the relationship between stressors and sleep quality. In fact, only one study was found (i.e., Sadeh et al., 2004) that examined the effects of problem-focused and emotion-focused coping in the context of stress and sleep.

The current study is designed to fill a much-needed gap in the stress literature by investigating the relationship between stressors on a physical outcome, sleep quality. Another purpose of the study is to examine how coping impacts the relationship between work stressors and sleep quality. In the literature review, the importance of studying sleep is elaborated upon. Moreover, theory and prior research is summarized to posit how work stressors will be related to sleep, as well as the effect of problem-focused and emotion-focused coping on stressor-sleep relationships. The first study employs a cross-sectional design to investigate the relationship between two stressors (i.e., workload and incivility) and sleep quality. Additionally, the effect of problem-focused and emotion-focused coping is investigated. The second study builds upon the first study through the use of a daily experience sampling method (ESM) in order to test the

hypotheses. Moreover, an additional contribution to the occupational health literature is made in the second study by measuring sleep quality with both self-reports of sleep quality and objective sleep quality through the use of actigraphy.

CHAPTER 2: THE IMPORTANCE OF STUDYING SLEEP

One reason sleep is important to study is that a negative relationship between sleep and cognitive functioning has been consistently supported throughout the sleep literature. For instance, a meta-analysis conducted by Pilcher and Huffcutt (1996) found that sleep deprivation was significantly related to performance decrements on motor and cognitive tasks. Additionally, Durmer and Dinges (2005) provide an extensive review of empirical studies examining the relationship between sleep and performance on cognitive tasks, which include increased errors, slower response times, and decreased learning from tasks. Williamson and Feyer (2000) found that moderate sleep deprivation (roughly 18 hours without sleeping) impacted performance on passive vigilance, symbol coding, and reaction time tests in a similar manner as having a blood alcohol content level of 5%.

Sleep deprivation has also been shown to negatively impact workplace safety. Dinges (1995) found that sleepiness and fatigue were positively related to accidents in the workplace. Similarly, a large-scale survey conducted by Rosekind et al. (2010) found that sleepiness was negatively correlated with workplace safety. Specifically, their study provided evidence that individuals who experience disturbed sleep are more likely to not only experience more injuries themselves but engage in behaviors that increase the risk of injuries to others. Moreover, a study conducted by Barnes and Wagner (2009), that evaluated archival data from 1983-2006, provided evidence that minimal sleep loss can impact not only the number of workplace injuries, but also the severity of those injuries. Specifically, on the Monday following Daylight Saving Time (advancing one hour), there was one average 3.6 more injuries in the workplace. Additionally, compared to other workdays, injuries on those Mondays accounted for an average of 2,649 more lost workdays. Supporting the idea that even minimal amounts of sleep loss can have detrimental

effects in terms of sleep loss, Barnes and Wagner (2009) also found that individuals on Mondays following Daylight Saving Time people on average slept only forty minutes less compared to other days during the workweek.

In summary, sleep is important to study because of its potential impact on both job performance and safety. When individuals sleep poorly, their cognitive and motor functioning is typically worse (Durmer & Dinges, 2005), which negatively impacts their productivity (Pilcher & Huffcutt, 1996). More importantly, poor sleep is positively associated with injuries in the workplace (Rosekind et al., 2010) and the severity of those injuries (Barnes & Wagner, 2009). Based on the implications of poor sleep for both performance and safety in the workplace, it is important to examine the relationships between work stressors and sleep.

CHAPTER 3: WORKLOAD AS A PREDICTOR OF SLEEP QUALITY

Workload is defined as the amount of work an individual is expected to complete in a given period of time and is typically measured in terms of hours worked, quantity of an item produced, or the mental demands associated with a task (Spector & Jex, 1998). Prior research investigating the relationship between workload and sleep has shown that excessive workload results in worse sleep. For example, De Lange et al. (2009) found that job demands were negatively related to sleep quality. Similarly, Knudsen et al. (2007) found that work overload was positively correlated with poor sleep quality amongst full-time employees in the U.S. One explanation for the negative relationship between workload and sleep quality is that an excessive workload encroaches on time that could be spent recovering through sleep (Barnes et al., 2012). Thus, employees working in occupations that require working overtime, long shifts, or night shifts, may experience poorer sleep quality (Kanazawa et al., 2006; Lin et al., 2014). Therefore, in accordance with the stress literature, it is hypothesized that workload will be negatively related to sleep quality.

Hypothesis 1

Workload will be negatively related to sleep quality.

CHAPTER 4: INCIVILITY AS A PREDICTOR OF SLEEP QUALITY

According to Andersson and Pearson (1999), incivility is a “low-intensity deviant behavior with ambiguous intent to harm the target, in violation of workplace norms for mutual respect” (p. 457). Empirical evidence has found that incivility is related to sleep-related outcomes. For example, Holm et al. (2015) found that workplace incivility was related to sleeping problems. Similarly, Demsky et al. (2018) provided evidence that both coworker and supervisor incivility were related to symptoms of insomnia. The theoretical mechanism that was found to explain the relationship between experienced incivility and insomnia symptoms was rumination. Based on this prior empirical evidence of the relationship between incivility and sleep-related variables, it is hypothesized that perceptions of incivility will be negatively related to sleep quality.

Hypothesis 2

Incivility will be negatively related to sleep quality.

CHAPTER 5: COPING CONCEPTUALIZATIONS

Over the years the conceptualization of coping has evolved within the stress and well-being literature. Initially, coping was considered to be a subconscious effort. That is, coping was thought to be a “psychodynamic process,” meaning that coping is a defense mechanism and that individuals possess psychopathologies that predict how they will cope with stressors (Somerfield & McCrae, 2000). In a similar fashion, coping has also been conceptualized as a trait. Specifically, Dewe and Cooper (2007) theorized that personality traits predict the way that people will react and subsequently cope when dealing with a stressor.

The most recent conceptualization of coping suggests that coping is a process influenced by the context surrounding the experience of a stressor. Based on this conceptualization, coping is defined as a “person’s cognitive and behavioral efforts to manage (reduce, minimize, master, or tolerate) the internal and external demands of the person-environment transaction that is appraised as taxing or exceeding the person’s resources” (Folkman et al., 1986, p. 572). This conceptualization of coping as a process was first conceived in Lazarus and Folkman’s (1984) transactional theory of stress. According to Lazarus and Folkman’s transactional theory of stress, individuals first appraise whether or not a situation poses a threat to their well-being, which they called “primary appraisal.” The second step in the coping process is defined as “secondary appraisal,” during which individuals evaluate their coping options to deal with a stressor. Additionally, the authors of this theory posited that there are two primary types of coping, problem-focused and emotion-focused coping, which are differentiated by the target of the coping efforts made by the individual (Folkman & Lazarus, 1985; Folkman et al., 1986). Problem-focused strategies, such as planful problem solving, are those that are directly aimed at reducing the presence or level of a stressor (Folkman & Lazarus, 1985; Folkman et al., 1986;

Lazarus, 1991). In contrast, emotion-focused coping strategies are those aimed reducing the negative emotions associated with the experience of a stress and consist of actions like seeking social support or actively avoiding the stressor (Lazarus, 1991). The current study draws from literature examining the effects of both types of coping on well-being to theorize how these two coping strategies will moderate the relationships between stressors and sleep quality.

CHAPTER 6: EFFICACY OF PROBLEM-FOCUSED AND EMOTION-FOCUSED COPING STRATEGIES

Research using Folkman and Lazarus' (1980) conceptualization of coping as either problem-focused or emotion-focused has sought to investigate which of these strategies tend to be most beneficial when coping with stress, and which is more maladaptive. The stress literature has consistently shown that problem-focused coping strategies promote well-being, while emotion-focused coping is detrimental (Chang et al., 2006; Lewin & Sager, 2009; Moskowitz et al., 2009). Problem-focused coping strategies are aimed at alleviating the source of stress (Folkman et al., 1986); therefore, when individuals engage in more problem-focused coping behaviors and cognitions they will experience less strain.

In contrast, emotion-focused coping strategies are those targeted at the distressing emotions individuals feel as a result of experiencing stressors. The underlying mechanism that explains the deleterious effect of emotion-focused coping as a response to stress is that emotion-focused coping behaviors are aimed at temporarily alleviating negative emotional reactions to stressors, but not the stressors themselves. As a result, the stressor continues to be a source of stress resulting in increased strain.

Benefits of Problem-focused Coping

Prior research investigating the impact of problem-focused coping has suggested that individuals who use more problem-focused coping strategies experience greater well-being and less strain. For instance, Lewin and Sager (2009) found that problem-focused strategies buffered the relationship between role stress (i.e., role conflict and role ambiguity) and emotional exhaustion. In addition to emotional exhaustion, empirical evidence has suggested that the use of problem-focused coping strategies is positively associated with general mental health (Chang et

al., 2006). Research has also suggested that taking direct action to cope with a stressor is associated with greater physical health (Moskowitz et al., 2009). Finally, one study has investigated the effects of problem-focused coping on sleep (Sadeh et al., 2004) and found that individuals who utilized more problem-focused coping slept better than individuals who used more emotion-focused coping. Although the authors included problem-focused coping as an exploratory variable in their study, it is possible that individuals who engage in more problem-focused coping strategies as a response to stressors alleviate and reduce the magnitude of the stressor. As a result, when individuals are able to reduce the magnitude of the stressor, they do not ruminate or worry about the stressor at night and are able to experience better sleep. This is consistent with previous studies (e.g., Chang et al., 2006; Lewin & Sager, 2009) that have posited that problem-focused coping strategies are beneficial because the source of stress is directly addressed and does not persist as a source of stress.

Prior research has found that when individuals experience a high workload, they may also experience worse sleep (Kanazawa et al., 2006; Lin et al., 2014). However, if they take active steps to plan and address their workload directly through problem-focused coping, it may help them more effectively manage their workload. As a result, problem-focused coping should buffer the relationship between workload and sleep quality. In addition, workload may be a stressor that is typically more conducive to change through problem-focused coping behaviors and cognitions, such as planning how to address a busy workday. When stressors are more likely to be amenable to change, individuals should experience less strain when they cope in a problem-focused manner (Folkman et al., 1986). Therefore, the following hypothesis is proposed based on the research that has found problem-focused coping to be an effective way to cope with stressors.

Hypothesis 3

The relationship between workload and sleep quality will be moderated by problem-focused coping such that the negative relationship between workload and sleep quality will be weaker for those who report higher levels of problem-focused coping.

A hypothesis concerning the effect of problem-focused coping on the relationship between incivility is not proposed in the current study. This decision was made because the transactional theory of stress suggests that problem-focused coping strategies are used when a stressor is more amenable to change (Folkman & Lazarus, 1985; Folkman et al., 1986; Lazarus, 1991). Incivility is a low-intensity form of mistreatment with ambiguous intent (Andersson & Pearson, 1999). Based on this definition, incivility is a discrete event and once it occurs, the recipient typically cannot change the event. With that being said, some research has taken a critical incident approach to studying instances of incivility and found that individuals who avoided the perpetrator more experienced worse strain, whereas individuals who confronted the perpetrator were more likely to forgive them (Hershcovis et al., 2018). Although these two types of responses may reflect some sort of emotion-focused (avoiding) and problem-focused (confronting) coping, the source of stress is the perpetrator, whereas the current study examines experienced incivility as the primary source of stress. Therefore, based on the idea that experienced incivility is typically less amenable to change compared to workload, the current study does not propose a hypothesis regarding the moderating effect of problem-focused coping on the relationship between incivility and sleep quality.

Detriments of Emotion-focused Coping

In contrast to the benefits of problem-focused coping, research on emotion-focused coping has consistently provided evidence that the use of emotion-focused coping is detrimental

to individual well-being. For instance, Lewin and Sager (2009) found that greater use of emotion-focused coping strengthened the relationship between role conflict and emotional exhaustion. Research has also provided evidence that individuals who use more emotion-focused coping experience greater emotional exhaustion (Sriwilai & Charoensukmongkol, 2016) and burnout (Chang, 2012).

In contrast to problem-focused coping, individuals who tend to use more emotion-focused coping will experience higher levels of strain in response to work stressors. Emotion-focused coping strategies are aimed at addressing the negative emotions individuals experience when faced with stressors (Folkman & Lazarus, 1985; Folkman et al., 1986). In attending to the negative emotions of the stressful experience, the source of stress (i.e., the stressor) is not addressed. Such coping efforts are maladaptive because the stressor continues to be a source of stress which results in increased strain. Therefore, the following hypotheses, concerning the effect of emotion-focused coping on the relationships between workload and sleep quality and between incivility and sleep quality, are proposed based on research that has found emotion-focused coping to have negative ramifications when coping with stress.

Hypothesis 4

The relationship between workload and sleep quality will be moderated by emotion-focused coping strategies, such that the negative relationship between workload and sleep quality will be stronger for those who report higher levels of emotion-focused coping.

Hypothesis 5

Emotion-focused coping strategies will moderate the negative relationship between incivility and sleep quality, such that the relationship will be stronger for those who report higher levels of emotion-focused coping.

CHAPTER 7: STUDY 1 METHOD

Participants and Procedure

The first study utilized archival data previously collected from Amazon's Mechanical Turk (MTurk). A power analysis in G*Power (Faul et al., 2009) indicated that for two predictors, one moderator, and one outcome variable, a sample size of 35 to 40 participants is adequate for detecting a moderate effect size ($f_2 = 0.05$) with 80% power and an alpha .05. Given that estimate, the first study had ample power to detect all hypothesized effects.

Because there is a concern regarding whether or not participants from MTurk are representative of a working population, participants were only allowed to partake in the survey provided that they meet a number of criteria. Specifically, participants must have been at least 18 years of age and employed at least part time at the time the data were collected. Only participants who met all of the above criteria were permitted to complete the survey. Additionally, a number of quality control checks were used in the survey to ensure that only participants who filled out the survey intentionally were maintained in data analysis.

There were 589 participants who initially completed the survey. Of those individuals, 478 passed the quality control checks and provided usable data for testing the hypotheses. Therefore, the final sample for the current study includes 478 participants. The average age was 34.77 ($SD = 9.70$). The youngest participant was 20 and the oldest was 74 years of age. 57.4% of the sample identified as male. 44.05% of the sample reported that they had at least a bachelor's degree, 11.69% reported that they had a master's degree, and 1.46% reported having beyond a master's degree. Regarding income, 40.71% reported that they make in between \$25,000 and \$49,999. 22.96% of the participants reported that they make between \$50,000 and \$74,999. The average

hours worked during the week was 41.26 hours ($SD = 8.75$) with a minimum of 10 hours and a maximum of 82. 75.78% of the sample was White, 16.91% was Black, and 5.01% was Hispanic.

Measures

Appendix A contains a list of all measures used in study 1.

Coping Strategies

Coping strategies were measured with 8 items from the COPE created by Carver et al. (1989). Four items were used to measure problem-focused coping and four were used to measure emotion-focused coping. The scale measures various types of coping strategies; however, the four items with the highest factor loadings for their respective scales were used to measure problem-focused coping (active coping, planning, restraint, and suppressing competing activities) and emotion-focused coping (support for emotional reasons and venting emotions). Participants were prompted to consider how they generally deal with stress and indicate the degree to which they agree with each statement. A sample problem-focused coping item is, “I try to come up with a strategy about what to do.” The reliability for this measure was .57, which is lower than the minimally acceptable .70 (Cortina, 1993). A sample emotion-focused coping item is, “I talk to someone about how I feel.” The coefficient alpha for this measure was .84. Items for both measured were answered on a five-point Likert scale (1 = *strongly disagree*, to 5 = *strongly agree*).

Workload

Workload was measured using five items from Spector and Jex’s (1998) Quantitative Workload Inventory measure (QWI). The measure consists of items such as, “How often does

your job require you to work fast?” and “How often does your job leave you with little time to get things done?” The items were measured on a five-point Likert scale (1 = *never*, to 5 = *extremely often*). The items had good reliability ($\alpha = .86$).

Incivility

Incivility was measured with four items from Cortina et al. (2001) incivility measure. The measure prompts individuals to indicate how often they have experienced the items whilst interacting with either their coworker/supervisor in the past month. The measure consists of items like, “paid little attention to your (their) statements or show little interest in your (their) opinions?” Items are measured on a five-point Likert scale (1 = *never*, to 5 = *extremely often*). The items had good reliability ($\alpha = .91$).

Subjective Sleep Quality

Sleep quality captures aspects of sleep like how rested individuals feel after sleeping or the depth of an individual's sleep (Buysse et al., 1989; Pilcher et al., 1997). Additionally, sleep-quality measures often ask if respondents had trouble falling asleep and how frequently they woke up throughout the night, whereas sleep-quantity measures assess how long an individual slept. Therefore, the current study measured subjective sleep quality was measured with four items from Jenkins et al. (1988). Participants were asked to respond with how frequently they experienced sleeping problems. A sample item is “had trouble falling asleep.” Items were measured on a 6-point Likert scale (1 = *never*, to 5 = *22-31 days*). For ease of interpretation, sleep quality was reverse coded such that higher responses represent greater sleep quality. These items had good reliability ($\alpha = .91$).

Control Variables

For the workload moderation hypotheses, the effect of problem-focused coping and emotion-focused coping on the relationship between workload and sleep were computed in the same analysis. Because individuals could have coped with their workload using both problem-focused and emotion-focused coping strategies, both were included to account for both types of coping in testing the moderation hypotheses.

Age and gender were also controlled for in the analyses. Age was controlled because prior research has suggested age may be related to perceptions of coping resources (Trouillet et al., 2009) and use of coping styles, such as avoidance (Gianakos, 2002). Gender was controlled for because it is possible that females may have extra familial roles outside of work (Duxbury & Higgins, 1991) that impact sleep quality.

Data Analysis

In order to test the proposed hypotheses, a series of hierarchical regression analyses were conducted using SPSS Version 25. In order to test Hypotheses 1 and 2, a simple regression analysis was conducted to test whether or not the two stressors, workload and incivility, are significant predictors of sleep quality.

In order to test Hypotheses 3 and 4, moderated regression analyses were conducted. Hypothesis 3 suggests that the use of problem-focused coping will weaken the relationship between workload and sleep quality. In contrast, Hypothesis 4 and 5 suggest that the use of emotion-focused coping will strengthen the relationship between the stressors and sleep quality. In preparing the data for computing a moderated regression analysis, interaction terms were created with the stressors and the use of specific coping strategies. Additionally, the variables

were mean centered in order to reduce irrelevant multicollinearity (Tabachnik & Fidell, 2012, p. 827). After preparing the data, hierarchical regression analyses were conducted.

Analyzing the hypothesized moderation effects with a moderated regression is appropriate because a priori hypotheses were proposed regarding the interactive relationships between the stressors and moderators with the sleep (Tabachnik & Fidell, 2012, p. 143). The moderated regressions were computed by regressing sleep quality onto one of the stressors. The first step of the moderated regression is to enter the control variables. In step two, both the stressor and moderators were entered in the analysis. In order to test the moderation hypotheses, the interaction terms were entered at step three. Additionally, for significant interaction terms, the relationship between stressors and sleep quality were plotted at high (+1SD) and low levels (-1SD) of each of the moderators (Aiken et al., 1991).

CHAPTER 8: STUDY 1 RESULTS

Descriptive statistics

On average, participants reported experiencing a moderate to low amount of incivility ($M = 1.95$, $SD = 1.02$) and a moderate amount of workload ($M = 3.19$, $SD = 0.87$). On average, participants reported using a moderate amount of emotion-focused coping strategies ($M = 3.14$, $SD = 0.98$) and problem-focused coping strategies ($M = 3.66$, $SD = 0.65$). Participants reported that they experienced moderate to moderately high sleep quality ($M = 4.13$, $SD = 1.41$). The observed and possible ranges for the variables were nearly identical, which suggests range restriction is not a concern in the current study. Coefficient alphas are provided in the correlation table. For a full list of descriptive statistics, including range and reliability, see Table 1.

Correlations are provided in Table 2.

Table 1: Descriptive statistics and reliabilities study 1

Variable	Mean	SD	Possible Range	Observed Range	Alpha
Incivility	1.95	1.02	1-5	1-4.75	.91
Workload	3.19	0.87	1-5	1-5	.86
Emotion-focused Coping	3.14	0.98	1-5	1-5	.84
Problem-focused Coping	3.66	0.65	1-5	1-5	.57
Sleep Quality	4.13	1.41	1-6	1-6	.91

Note. N = 478

Table 2: Correlations study 1

Variable	1	2	3	4	5
1 Incivility	-				
2 Workload	.44**	-			
3 Emotion-focused Coping	.20**	.08	-		
4 Problem-focused Coping	.17**	.17**	.40**	-	
5 Sleep Quality	-.51**	-.42**	-.04	-.09*	-

Note. $p < .05 = *$, $p < .01 = **$

Main Effects

The correlations between the stressors and sleep quality were consistent with the main effect hypotheses (Table 2). In addition, hierarchical regression analyses were used to test the hypothesized main effect relationships between both workload and incivility and sleep quality. Unstandardized beta-coefficients are reported in Tables 3 and 4. As can be seen in Table 3, workload was negatively related to sleep quality ($b = -0.68, p < .001$). Therefore, Hypothesis 1 was supported. As shown in Table 4, incivility was negatively to sleep quality ($b = -0.75, p < .001$). Therefore, Hypothesis 2 was supported.

Moderation Hypotheses

In order to test Hypotheses 3-5 a series of hierarchical regression analyses were conducted. Hypothesis 3 posited that problem-focused coping would buffer the relationship between workload and sleep quality. As can be seen in Table 3, workload was significantly related to sleep quality at step two of the analysis ($\Delta R^2 = .18, p < .001; b = -0.68, p < .001$). In the third step, the interaction between workload and problem-focused coping was not significant ($b = -0.11, p = .31$). Therefore, Hypothesis 3 was not supported.

Hypothesis 4 posited that the negative relationship between workload and sleep quality would be exacerbated by emotion-focused coping. As shown in Table 3, step two of the regression analysis indicated that workload and emotion-focused coping explained 18% of the variance in sleep quality, although only workload was significant ($b = -0.68, p < .001$). In the third step, the interaction between workload and emotion-focused was significantly related to sleep quality ($b = -.15, p < .05$). In order to further explore this interaction effect, the relationship between workload and sleep quality was plotted for those high (+1SD) versus low (-1SD) on emotion-focused coping (Aiken et al., 1991).

As shown in Figure 1, the negative relationship between workload and sleep quality was stronger for individuals who utilized more emotion-focused coping strategies. For individuals who reported using fewer emotion-focused coping strategies the relationship between workload and sleep-quality was negative but weaker.

Following recommendations by Aiken et al. (1991), a simple slopes analysis was conducted to further support the form of this moderator effect. This analysis indicated that the regression slope for those reporting fewer emotion-focused coping strategies ($b = -0.56, p < .001$) was smaller than the regression slope for those reporting greater use of emotion-focused coping strategies ($b = -0.84, p < .001$). Therefore, Hypothesis 4 was supported.

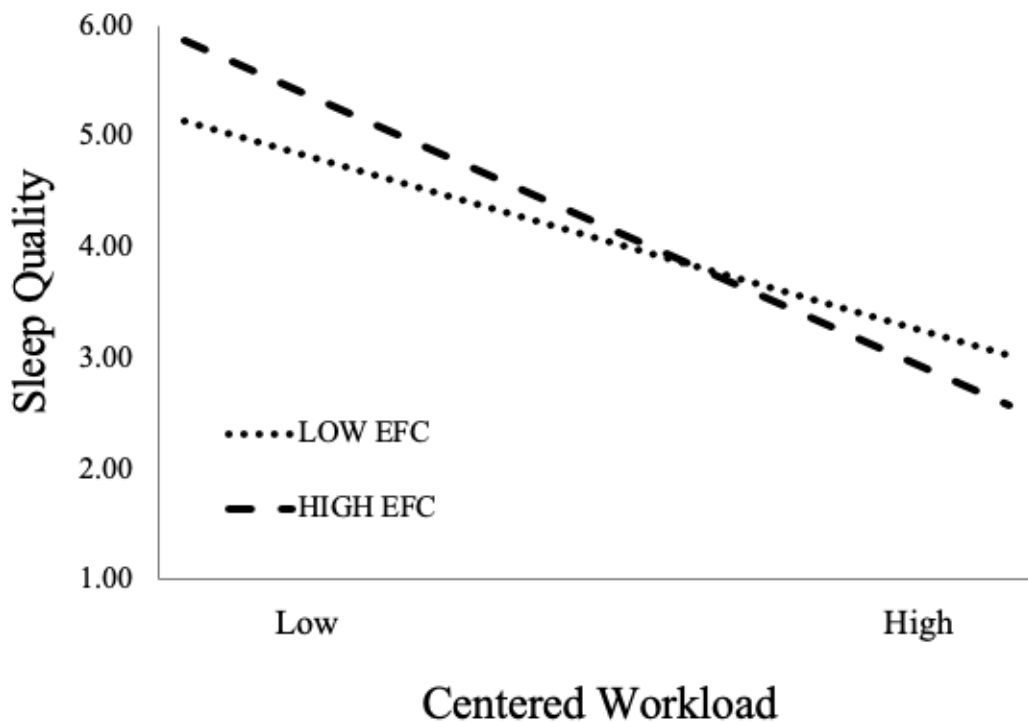


Figure 1: The workload-sleep quality relationship moderated by emotion-focused coping

Table 3: Workload and sleep quality: Moderated by PFC and EFC

	Step 1		Step 2		Step 3	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Step 1						
Intercept	3.93***	0.30				
Age	0.00	0.01				
Gender	0.04	0.13				
Step 2:						
Intercept			4.02***	0.27		
Age			0.01	0.01		
Gender			-0.05	0.12		
Workload			-0.68***	0.07		
Emotion-focused coping			0.01	0.07		
Problem-focused coping			-0.04	0.10		
Step 3:						
Intercept					4.17***	0.27
Age					0.01	0.01
Gender					-0.13	0.12
Workload					-0.71***	0.07
Emotion-focused coping					0.04	0.07
Problem-focused coping					-0.04	0.10
Workload x EFC					-0.15*	0.07
Workload x PFC					-0.11	0.10
<i>R</i> ²	.00		.18***		.20**	
ΔR^2			.18		.02	

Note. N = 478. Unstandardized coefficients are reported. EFC = Emotion-focused coping, PFC = Problem-focused coping. $p < .05 = *$, $p < .01 = **$, $p < .001 = ***$

Hypothesis 5 posited that the negative relationship between incivility and sleep quality would be exacerbated for individuals who utilized more emotion-focused coping. As shown in Table 4, incivility and emotion-focused coping explained 27% of the variance in sleep quality in the second step of the hierarchical regression. Incivility was negatively related to sleep quality ($b = -0.75, p < .001$). In the third step, the interaction between incivility and emotion-focused coping was significantly related to sleep quality ($b = -0.14, p < .05$).

To further investigate the nature of this interaction, the relationship between incivility and sleep quality was plotted at high and low levels of emotion-focused coping, which can be found in Figure 2. The negative relationship between incivility and sleep quality was stronger for individuals who used more emotion-focused coping strategies. The relationship between incivility was weaker, but still negative, for individuals who used fewer emotion-focused coping strategies. Following recommendations made by Aiken et al. (1991), simple slopes analyses were conducted to investigate the relationship between incivility and sleep quality at low (-1SD) and high (+1SD) levels of emotion-focused coping. The relationship between incivility and sleep quality was weaker for individuals who used more emotion-focused coping ($b = -0.57, p < .001$) compared to individuals who reported that they use more emotion-focused coping strategies ($b = -0.79, p < .001$). Therefore, Hypothesis 5 was supported.

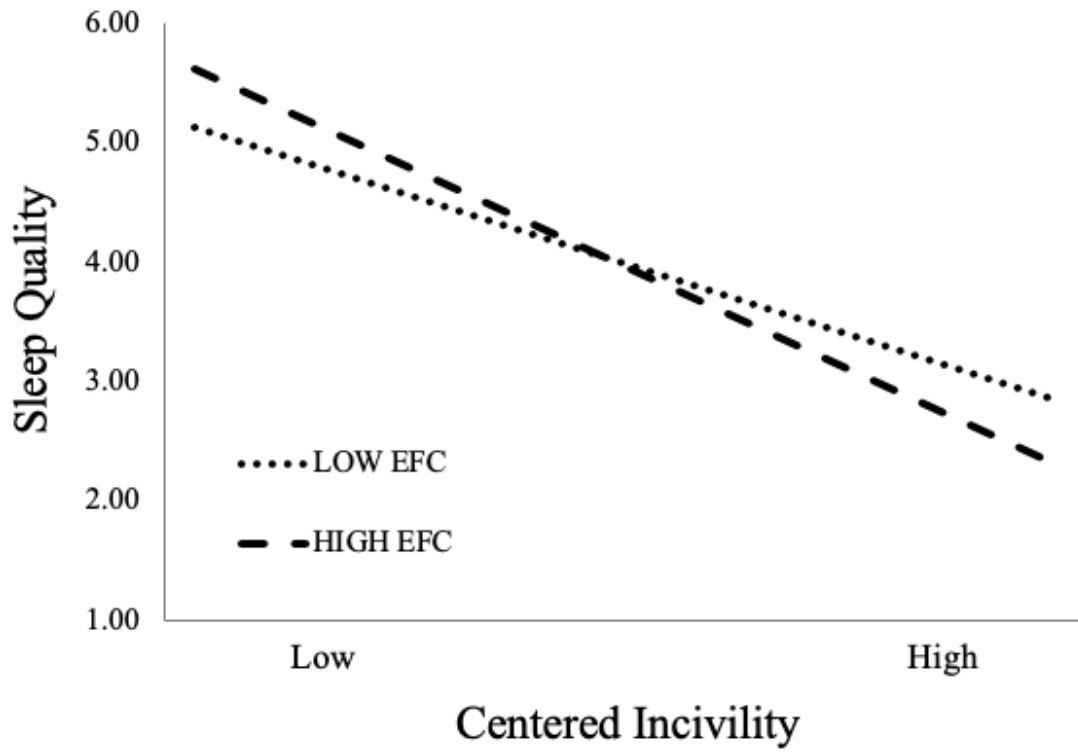


Figure 2: The incivility-sleep quality relationship moderated by emotion-focused coping

Table 4: Incivility and sleep quality: Moderated by EFC

	Step 1		Step 2		Step 3	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Step 1						
Intercept	2.74***	0.24				
Age	0.00	0.01				
Gender	0.04	0.13				
Step 2:						
Intercept			4.66***	0.26		
Age			-0.01	0.01		
Gender			-0.20	0.12		
Incivility			-0.75***	0.06		
Emotion-focused coping			0.12*	0.06		
Step 3:						
Intercept					4.76***	0.06
Age					-0.01	0.01
Gender					-0.26*	0.12
Incivility					-0.70***	0.06
Emotion-focused coping					0.10*	0.06
Incivility x EFC					-0.14*	0.06
<i>R</i> ²	.00		.27***		.28*	
ΔR^2			.27		.01*	

Note. N = 478. Unstandardized coefficients are reported. EFC = Emotion-focused coping, PFC = Problem-focused coping. $p < .05 = *$, $p < .01 = **$, $p < .001 = ***$

CHAPTER 9: STUDY 1 DISCUSSION

Consistent with prior research, the current study found that workload was negatively related to sleep quality (Barnes et al., 2012; De Lange et al, 2009). It was also found that incivility was negatively related to sleep quality, which is also consistent with previous research (Demsky et al., 2018; Holm et al., 2015). These findings are consistent with the stressor-strain model, and a large body of research, that has shown that when individuals experience greater levels or amounts of stressor, they are more likely to also experience increased strain (Spector & Jex, 1998). Given the potential impact of low sleep quality on work performance and safety, these findings provide further evidence that organizations should take steps to make workloads more reasonable and make an effort to decrease workplace incivility.

Findings from this study also provided evidence that emotion-focused coping may not be an effective way of coping with both stressors, at least in terms of relations with sleep quality. That is, when individuals utilized more emotion-focused coping strategies this exacerbated the negative relationships between both stressors and sleep quality. These findings are consistent with past empirical findings that have suggested when individuals utilize more emotion-focused coping strategies they more likely to experience strain (e.g., Chang, 2012; Sriwilai & Charoensukmongkol, 2016). These findings are explained by the idea that attending to one's stress through emotion-focused coping strategies may be maladaptive because a person focuses on the negative emotions that result from experiencing stress, rather than addressing the stressor directly. Because emotion-focused coping strategies are not aimed at reducing or eliminating stressors, the stressor continues to be a source of strain if it continues to go unaddressed, which is consistent with the stronger stressor-strain relationships for individuals who reported greater use of emotion-focused coping strategies.

Another goal of Study 1 was to advance the stress literature by investigating the moderating effect of problem-focused coping on the relationship between workload and sleep-quality. It was hypothesized that problem-focused coping would buffer the relationship between workload and sleep quality. However, results of the first study provided no support for such a buffering effect.

One potential explanation for the non-significant findings for problem-focused coping is that problem-focused coping was measured generally. In other words, participants were asked how frequently they used coping strategies over a month, but not the context in which the coping strategies were used. Therefore, it is possible that people used problem-focused coping outside the context of work, and even if they were using problem-focused coping at work, it is unclear whether or not such coping efforts were directed at addressing their workload. The assumption in measuring coping in this manner is similar to a trait-based approach, which would suggest that participants used the same coping strategies to address all of the stressors they encounter in their daily life. Therefore, while individuals may very well have general coping tendencies, they may not apply these general coping strategies to all stressors, which would explain why no moderating effects were found.

This rationale may sound contradictory considering the significant results that were found for emotion-focused coping. However, emotion-focused coping is characterized by dealing with the negative affect that often accompanies stressors (Folkman & Lazarus, 1985, Folkman et al., 1986; Lazarus, 1991). As such, it is possible that the use of emotion-focused coping strategies is consistent across a wide variety of stressors. Said differently, negative emotions may be experienced regardless of the stressor induces them. Therefore, an individual's tendency to use

emotion-focused coping strategies, such as venting about the negative emotions they feel, may generalize to workload, incivility, or any other stressor.

As previously mentioned, prior research has suggested that the use of problem-focused coping strategies is more beneficial to dealing with a stressor because those strategies are directly aimed at reducing the magnitude of a given stressor. However, this assumes that individuals have some level of control over their workload. Prior research on coping has suggested that active coping is beneficial in buffering the relationship between work stress and strain when individuals are also highly self-efficacious (Jex et al., 2001). Said differently, problem-focused coping may be beneficial when individuals feel some level of control or confidence when dealing with stressors at work. Therefore, it is possible that participants in the current study did not feel efficacious in their use of problem-focused coping, which could explain why the moderator hypotheses related to problem-focused coping were not significant.

In summary, it was found that the negative relationships between both workload and incivility and sleep quality were exacerbated for individuals who used more emotion-focused coping strategies. These findings provide further evidence of the detrimental effect of emotion-focused coping on the relationship between work stress and strain. Prior to the current study, the impact of coping on the relationship between work stress and sleep quality was sparse. Therefore, this first study takes a small step in trying to understand how certain coping strategies impact the relationship between work stress and sleep quality.

While the results showed that emotion-focused coping strategies exacerbated the relationship between stressors and sleep quality, problem-focused coping did not buffer the relationship between workload and sleep quality. These findings need to be considered in light of Study 1's limitations. As stated earlier, coping was measured generally rather than targeted

towards a specific stressor. Secondly, the current study is cross-sectional in nature. A more rigorous examination of these hypotheses would be to test them at the day level over a period of time. Thirdly, the first study utilized self-report measures of sleep quality. Although, prior research has found that self-perceptions of sleep do relate to well-being (e.g., Legree et al., 2003; Rosekind et al., 2010), it is also important to investigate objective sleep quality. Finally, another severe limitation of the current study is the poor reliability of problem-focused coping. The coefficient alpha was below .70 which is typically an acceptable lower bound reliability (Cortina, 1993). This was surprising given that the four items come from a frequently used coping measure (Carver et al., 1989). As such, the finding from the first study that involved the moderating effect of problem-focused coping on the relationship between workload and sleep quality should be interpreted with caution.

Therefore, a second study was conducted to replicate findings from Study 1. The second study also addressed a weakness in the first study by measuring coping specific to the stressor, rather than participants' general tendency to use coping strategies to cope with stress. Moreover, sleep quality was measured with both daily self-reports of sleep quality and an objective measure of sleep quality. This is an additional strength of the second study because the relationships between stressors and both objective and subjective sleep quality are investigated, as well as the effect moderating effects of problem-focused and emotion-focused coping strategies on those relationships.

CHAPTER 10: STUDY 2: DAILY ESM REPLICATION OF STUDY 1

The first study is beneficial because it helps establish correlational relationships between stressors and sleep quality. However, the first study is limited by its cross-sectional design and the fact that all measures were self-reported. Therefore, the second study seeks to replicate the first study, but do so using a longitudinal ESM design. Moreover, in addition to self-report measures of sleep, the second study measures sleep quality objectively through the use of actigraphy.

The second study proposes that the experience of workload and incivility on a particular day will negatively impact sleep that night. As previously discussed in the literature review, research suggests workload results in poor sleep quality when time spent working takes away time that individuals could recover from work (Barnes et al., 2012; Kanazawa et al., 2006; Lin et al., 2014). With regard to incivility, research suggests that one of the underlying mechanisms behind the relationship between incivility and poor sleep quality is rumination, such that individuals who experience incivility may ruminate over those experiences at night, resulting in poor sleep quality (Demskey et al., 2018). Thus, consistent with main effects from Study 1 and prior research that suggests that workload and incivility should be predictors of poor sleep quality, the following hypotheses are proposed.

Hypothesis 6a/b

Workload during the day will be negatively related to (a) subjective and (b) objective measures of sleep quality that night.

Hypothesis 7a/b

Incivility experienced at work during the day will be negatively related to (a) subjective and (b) objective measures of sleep quality that night.

Hypothesis 8a/b

Problem-focused coping strategies will moderate the relationship between workload and (a) subjective and (b) objective sleep quality, such that the negative relationship between workload and sleep quality will be weakened on the day's individuals report high levels of problem-focused coping.

Hypothesis 9a/b

Emotion-focused coping strategies will moderate the relationship between workload and (a) subjective and (b) objective sleep quality, such that the negative relationship between workload and sleep quality will be strengthened on the day's individuals report high levels of emotion-focused coping.

Hypothesis 10a/b

Emotion-focused coping strategies will moderate the relationship between incivility and (a) subjective and (b) objective sleep quality, such that the negative relationship between incivility and sleep quality will be strengthened on the day's individuals report high levels of emotion-focused coping.

CHAPTER 11: STUDY 2 METHOD

Participants and Procedure

Participants were recruited either through the SONA system or via fliers posted on campus at the University of Central Florida (UCF). SONA is a system that allows students at UCF to participate in Psychology research. Students at UCF typically sign up to participate in studies as a requirement for a course in which they are enrolled. Because the current study sought to examine a working population, only students who were 18 years or older and worked at least part time were permitted to participate in the study. Students were brought in for an initial screening in order to teach them how to use the actigraphs and then asked to complete a baseline survey. Upon completing the baseline survey, participants were awarded one SONA credit, which is consistent with recommendations and requirements for compensation for SONA studies. There were two potential waves that participants could be assigned to during the data collection; a non-extended wave (seven-day data collection) or an extended wave (thirty-five-day data collection). There were two different types of waves that participants could have been assigned to because the data used for Study 2 were collected in collaboration with other researchers, whose required participants to answer surveys and wear the actigraphs for an extended period of time. Because the sample size would be further limited if one of the two waves was excluded, both waves were used for conducting the analyses in Study 2. Participants who completed the seven-day data collection were compensated with a \$20 Amazon gift card and those completing the thirty-five-day data collection were compensated \$100. The recruitment procedure was the same for participants who were not recruited through fliers, except they were not awarded a SONA credit.

During the data collection period, depending on whether they were assigned to the non-extended or extended wave, participants completed two surveys a day for either seven or thirty-five days. The morning survey measured sleep quality from the prior night. The actigraphs, described in the measurement section, were also used to measure sleep quality. The evening survey measured workload, incivility, and coping strategies (see Figure 3).

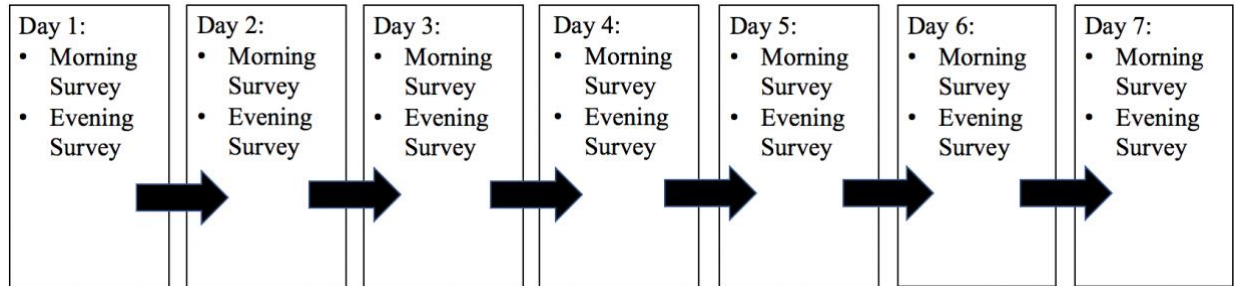


Figure 3: Example of one week of daily surveys

Initially, there were approximately 1,300 responses to the daily surveys. After removing survey responses that were not completed, there were 810 observations. Next, duplicate responses to the same daily survey were removed from the dataset in cases when the participant completed the same survey on the same day reducing the number of observations to 682. This decision was made in favor of taking a conservative approach to analyzing the data. 12 observations were lost because subjective sleep quality had to be lagged so that the stressors predicted next day sleep. Finally, some participants reported that their workload, or experience of incivility, was not stressful. Those participants did not respond to the coping items on those days, which severely limited the number of observations that could be used for hypothesis testing. Overall, there were 80 total observations to test the workload hypotheses and 58 total observations for the incivility hypotheses. Because complete data for a single participant across the data collection, whether in the seven day or thirty-five-day data collection, was unreasonable

to expect based on the above, pairwise deletion of missing data was used for all analyses. After elimination of missing data, there were roughly 2.5 observations per participant.

For the analyses, there were a total of 39 participants who had useable data ($N = 39$). Of those 39 participants, 30 were female. 63% of the participants were from the extended wave. 38.46% of the participants were white, 35.90% were Hispanic, and 20.51% of the participants were black. The mean age was 23.41 ($SD = 6.41$), with a minimum age of 18. 51.3% of the participants reported having their associate degree and an additional 28.2% reported that they had taken college courses but had not yet achieved their degree. The average amount of weekly working hours reported by our participants was 28.72 hours ($SD = 13.03$).

As previously mentioned, participants could have been a part of the extended or non-extended data collection. To see if participants differed in their experience of stressors, use of coping strategies, or sleep quality, t-tests were conducted to compare the two groups of participants. The only two significant mean differences were the amount of experienced incivility and sleep efficiency. The non-extended wave experienced slightly more incivility and the extended wave experienced slightly better objective sleep quality; however, the absolute mean difference between the two groups was negligible.

Evening Measures Study 2

See Appendix B for a full list of measures.

Coping

Coping was measured using the same items from Study 1 (Carver et al., 1989); however, participants in Study 2 were prompted to indicate how they specifically coped with their workload and incivility that day, rather than how they generally coped with each of the stressors.

Additionally, participants were only presented with the coping items if they worked that day. For instance, instead of “I try to come up with a strategy about what to do,” the item stem was changed to “I tried to come up with a strategy about what to do.” Additionally, the response scale for the coping items was changed to measure the frequency (1 = *never* to 5 = *very frequently*) with which people coped with workload or incivility on a given day. Moreover, two items were removed from the coping measures (one for problem- and one for emotion-focused coping). The two items were removed from Study 2 based on their factor loadings (Carver et al., 1989) and redundancy with other coping items. Participants were asked to indicate how they used problem-focused and emotion-focused coping in response to their workload. This problem-focused coping measure had poor reliability ($\alpha = .47$). The items that measured emotion-focused coping with workload had relatively low, but acceptable reliability ($\alpha = .75$). Participants only responded with how they used emotion-focused coping as a response to their experienced incivility. These items had good reliability ($\alpha = .87$).

Workload

The same measure of workload (Spector & Jex, 1998) was used from the first study with modifications to the stem and the scale (1 = *strongly disagree*, to 5 = *strongly agree*) of the measure to evaluate workload on a daily level. The reliability for this measure was good ($\alpha = .90$).

Incivility

The same measure of incivility (Cortina et al., 2001) was used from the first study with modifications to the stem and scale (1 = *never*, 5 = *very frequently*) to measure incivility on a daily level. This measure had good reliability ($\alpha = .83$).

Morning Measures

Subjective Sleep Quality

Subjective sleep quality was measured with four items from Scott and Judge (2006). Participants were asked to respond to what extent they experienced the certain symptoms regarding their sleep on a 1 – 5 Likert scale (1 = *to a very small extent*, 5 = *to a very large extent*). A couple sample items are “Woke up several time throughout the night?” and “Woke up after your usual amount of sleep feeling tired and worn out?” Items were reverse coded after the data collection so that higher scores indicate better sleep quality. This measure had good reliability ($\alpha = .80$).

Objective Sleep Quality

GT3X+ actigraphs will be used to measure objective sleep quality. Actigraphs are devices that are worn on the wrists of participants that collect sleep and exercise data in real time. Participants were instructed to wear these devices at all times of the day. Although there have been some questions regarding the validity and reliability of actigraphs for measuring sleep-wake periods, prior research has supported actigraphy as a reliable and valid method of measuring sleep-wake periods (Marino et al., 2013; Sadeh, 2011). Sleep quality was measured with sleep efficiency, which is the ratio between the time participants spent sleeping to the time they were in bed. Scores on this measure can range from 0-100, with higher scores indicating better sleep quality.

Control variables

Similar to Study 1, the interaction terms for both workload and problem-focused coping, and workload and emotion-focused coping, were entered into the analyses at the same time when

testing the hypotheses that concerned the relationship between workload and sleep quality. This was done because individuals could conceivably cope with their workload with both problem-focused coping and emotion-focused coping at the same time, and to varying degrees.

Autonomy was also entered as a control variable in the analyses because participants held a variety of jobs and therefore varied in the degree of autonomy to use certain coping strategies. Three items from Hackman and Oldham's (1974) Job Description Survey were used to measure autonomy. These items were administered on the baseline survey and asked participants to describe how accurate each item described their job on a seven-point Likert scale (1 = *very inaccurate*, 7 = *very accurate*). The measure had acceptable reliability ($\alpha = .75$). A sample is "The job gives me considerable opportunity for independence and freedom in how I do the work." Age and gender were also controlled for in the analyses. Age was controlled because it is prior research has found that age is related to perceptions of available coping resources (Trouillet et al., 2009) and use of coping styles, such as avoidance (Gianakos, 2002). Gender was controlled for because it is possible that females may have extra familial roles outside of work (Duxbury & Higgins, 1991) that impact sleep quality and emotional exhaustion.

Data Analysis

In order to test next morning sleep quality, sleep quality was regressed onto either workload or incivility on the prior day. Prior to analyzing the data, the predictors and moderators were centered. Centering was carried out based on recommendations made by Enders and Tofghi (2007). For within person analyses, it is recommended that the predictors and moderators are person-centered, rather than grand mean centered. Centering based on the person mean partials out between person variance in the day level variables. This type of centering is appropriate because the moderation hypotheses for the second study are framed within persons.

That is, it is hypothesized that the day level relationship between each stressor and sleep quality for an individual will differ depending on the type of coping strategies that are used on a given day.

In order to test Hypotheses 8(a/b) through 10(a/b) MPlus (Muthén and Muthén, 2017) was used to evaluate how daily problem- and emotion-focused coping moderates the relationship between stressors experienced that day and sleep quality that night. Interaction terms were computed to test each of the moderation hypotheses. The interaction terms were created in MPlus Version 8.3 (Muthén & Muthén, 2017) by multiplying the person-centered predictor and moderator for the corresponding moderation hypothesis. Prior to testing the hypotheses, subjective sleep quality was lagged in the dataset so that work stress predicted next day sleep quality. To test the moderation hypotheses, MPlus was used. Sleep quality was regressed on the predictor, moderator, and the cross-product of the predictor and the moderator. In MPlus, the variables were specified as within person variables. Maximum likelihood estimation with robust standard errors was used to estimate the parameters.

CHAPTER 12: STUDY 2 RESULTS

Descriptive statistics

The descriptive statistics correspond to the number of observations in the analyses that tested the hypotheses. On average, participants reported that they experienced a moderate amount of workload ($M = 2.98$, $SD = 1.23$) and used emotion-focused ($M = 1.96$, $SD = 0.93$) less frequently than problem-focused coping strategies ($M = 2.96$, $SD = 0.86$) to cope with their workload. Participants, on average, reported that they experienced relatively low levels of incivility at work ($M = 1.35$, $SD = 0.66$). The frequency of using of emotion-focused coping to cope with experienced incivility was moderate to low ($M = 1.96$, $SD = 1.10$). Regarding sleep quality, on average participants reported that their sleep quality was moderate to high ($M = 4.08$, $SD = 0.96$). The objective measure of sleep quality suggested that on average participants slept well ($M = 89.72$, $SD = 6.11$). For a full list of descriptive statistics, including range, reliability, see Table 5. ICC (1)'s were also reported for the day level variables of Study 2 and reported in Table 5. Table 6 provides correlations of the variables in Study 2.

Table 5: Descriptive statistics and reliabilities study 2

Variable	<i>N</i>	Mean	SD	Possible Range	Observed Range	ICC1	Alpha
Incivility	199	1.26	0.55	1-5	1-5	.19	.83
Workload	199	2.91	1.27	1-5	1-5	.39	.90
Emotion-focused Coping (Wrk)	87	1.98	0.90	1-5	1-4.33	.33	.75
Emotion-focused Coping (Inc)	57	1.87	1.04	1-5	1-5	.43	.87
Problem-focused Coping (Wrk)	87	3.00	0.83	1-5	1-5	.24	.47
Sleep Quality (Subjective)	199	4.18	0.89	1-5	74.89-100	.31	.80
Sleep Quality (Objective)	199	89.72	5.55	0-100	1-5	.18	-
Autonomy	39	5.25	1.23	1-7	2.67-7	-	.75

Note. (Wrk) = Workload, (Inc) = Incivility, Problem-focused coping only administered for coping with workload.

Table 6: Study 2 within persons correlations

Variable	1	2	3	4	5	6	7
1 Incivility	-						
2 Workload	.17*	-					
3 Problem-focused Coping (Wrk)	.05	.00	-				
4 Emotion-focused Coping (Wrk)	.01	.12	.04	-			
5 Emotion-focused Coping (Inc)	-.01	-.01	.08	.68**	-		
6 Subjective Sleep Quality	-.05	.06	-.20	-.10	-.19	-	
7 Objective Sleep Quality	-.10	-.09	-.15	-.12	-.20	-.02	-

$N = 57 - 199$. Data was deleted pairwise. Wrk = workload, Inc = Incivility.
 $p < .05 = *$, $p < .01 = **$

Within-person variability

Because the hypotheses were framed within-persons, a null intercept model was tested to examine if there was significant within-person variability for subjective sleep quality and objective sleep quality. Results from both analyses suggested that there was significant within-person variability for subjective sleep quality ($\sigma^2 = .56$, $p < .001$) and objective sleep quality ($\sigma^2 = 26.90$, $p < .001$). Therefore, based on the significant within person variability of both criteria, multilevel modeling was used to test the hypotheses.

Main effects

The main effects are summarized in Tables 7-10. Hypothesis 6 posited that workload would be negatively related to both subjective and objective measures of sleep quality. Contrary to this hypothesis, one's workload on a given day did not significantly predict subjective sleep quality that night ($\gamma = 0.19$, $p = .24$), nor objective sleep quality that night ($\gamma = 0.05$, $p = .96$). Hypothesis 7 posited that incivility would be negatively related to subjective and objective sleep quality. Contrary to this hypothesis, incivility experienced during the workday did not significantly predict subjective sleep quality ($\gamma = -0.11$, $p = .46$) nor objective sleep quality ($\gamma = -$

0.46, $p = .65$). In summary, the proposed main effects of work stressors on both subjective and objective sleep quality were not supported.

Moderation Hypotheses

Results that concerned Hypothesis 8 can be found in Tables 7 and 8. Hypothesis 8 posited that the negative, daily-level relationship between workload and sleep quality (both subjective and objective) would be attenuated for individuals who used more problem-focused coping strategies on a given day. Results indicated that problem-focused coping on a given day did not significantly weaken the relationship between workload and subjective sleep quality ($\gamma = 0.15$, $p = .41$). Therefore, Hypothesis 8a was not supported. Results indicated that problem-focused coping on a given day significantly moderated the relationship between workload and objective sleep quality ($\gamma = 3.53$, $p < .01$).

To further investigate the nature of this interaction, the relationship between daily workload and sleep quality was plotted at high (+1 SD) and low levels (-1 SD) of problem-focused coping and simple slopes analyses were conducted. As can be seen in Figure 4, the relationship between workload and sleep efficiency was stronger and positive for individuals who utilized more problem-focused coping strategies ($\gamma = 2.17$, $p = .17$), although the slope was not significant. In contrast, the relationship between workload and objective sleep quality was negative and stronger for individuals who utilized fewer problem-focused coping strategies ($\gamma = -2.06$, $p = .07$), although the slope was not significant. Because the initial high and low values of the moderator were not significant, the relationship between workload and objective sleep quality was plotted at different values of the moderator. At +2.5 standard deviations of the moderator, the positive relationship between workload and objective sleep quality was

significant ($\gamma = 5.00, p < .05$). At -1.5 standard deviations, the negative relationship between workload and subjective sleep quality was significant ($\gamma = -2.77, p < .05$). Therefore, the shape of the interaction plot and simple slopes analysis did not support Hypothesis 8b.

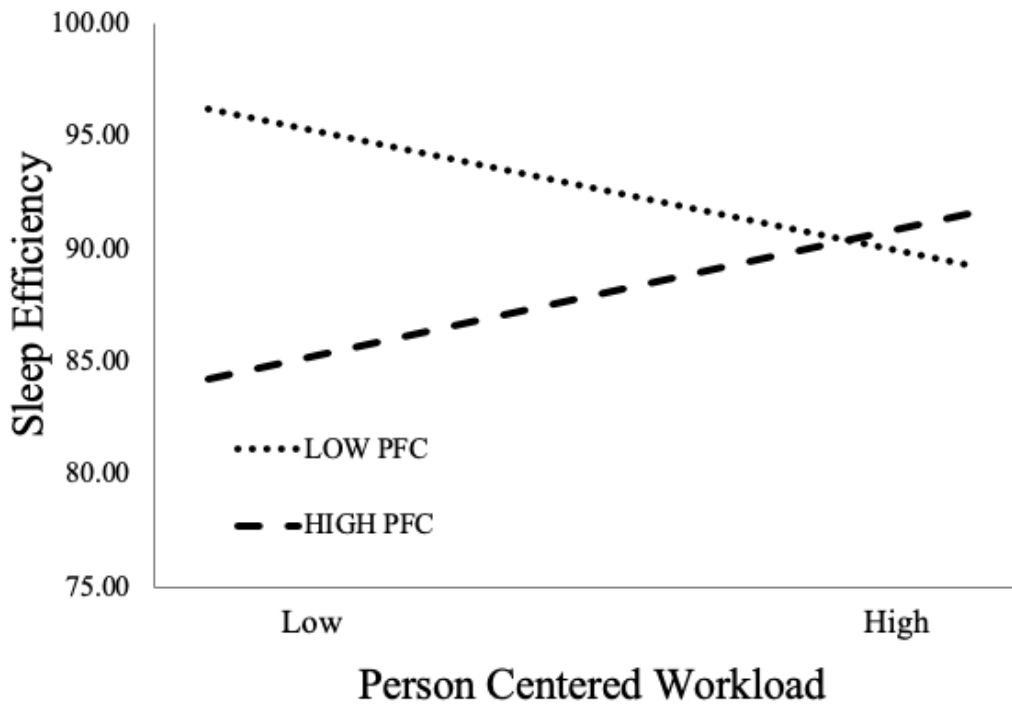


Figure 4: Workload and sleep efficiency moderated by problem-focused coping.

Hypothesis 9 posited that the negative, daily-level relationship between workload and sleep quality (both subjective and objective) would be exacerbated for individuals who use more emotion-focused coping strategies on a given day. The results are summarized in Tables 7 and 8. Results indicated that emotion-focused coping on a given day did not significantly strengthen the relationship between incivility and subjective sleep quality ($\gamma = 0.06, p = .80$). Therefore, Hypothesis 9a was not supported. Similarly, emotion-focused coping on a given day did not significantly strengthen the relationship between incivility and objective sleep quality ($\gamma = -2.98, p = .07$). Therefore, Hypothesis 9b was not supported.

Table 7: Workload-subjective sleep quality moderated by EFC and PFC

Dependent Variable	Subjective Sleep Quality	
Model Parameter	Coefficient	SE
Intercept	5.12	1.02
Day-level		
Workload	0.19	.16
PFC	-0.53*	0.21
EFC	-0.12	0.27
WorkloadxPFC	0.15	0.18
WorkloadxEFC	0.06	0.23
Person-level		
Workload	-0.37	0.23
PFC	0.28	0.17
EFC	0.10	0.21
Gender	-0.47	0.45
Age	-0.01	0.01
Autonomy	0.05	0.11
WorkloadxPFC	-0.14	0.47
WorkloadxEFC	-0.38	0.42

Note. PFC = problem-focused coping, EFC = emotion-focused coping, WorkloadxPFC = interaction term between workload and problem-focused coping, WorkloadxEFC = interaction term between workload and emotion-focused coping. $p < .05 = *$, $p < .01 = **$, $p < .001 = ***$. $N = 33$, Observations = 80.

Table 8: Workload-objective sleep quality moderated by EFC and PFC

Dependent Variable	Objective Sleep Quality	
Model Parameter	Coefficient	SE
Intercept	90.35	7.82
Day-level		
Workload	0.05	1.13
PFC	-3.71***	0.99
EFC	0.84	1.38
WorkloadxPFC	3.53**	1.26
WorkloadxEFC	-2.98	1.63
Person-level		
Workload	0.90	0.84
PFC	-2.01	1.48
EFC	-0.04	1.15
Gender	-1.83	2.90
Age	0.12	0.09
Autonomy	0.21	0.68
WorkloadxPFC	0.81	1.38
WorkloadxEFC	-0.84	1.60

Note. PFC = problem-focused coping, EFC = emotion-focused coping, WorkloadxPFC = interaction term between workload and problem-focused coping, WorkloadxEFC = interaction term between workload and emotion-focused coping. $p < .05 = *$, $p < .01 = **$, $p < .001 = ***$. $N = 33$, Observations = 80.

Results for Hypothesis 10 can be found in Tables 9 and 10. Hypothesis 10 posited that the negative, daily relationship between incivility and sleep quality (both subjective and objective) would be exacerbated for individuals who use more emotion-focused coping strategies on a given day. Results indicated the emotion-focused coping on a given day did not significantly strengthen the relationship between incivility and subjective sleep quality ($\gamma = 0.20$, $p = .52$). Therefore, Hypothesis 10a was not supported. Similarly, emotion-focused coping on a given day did not significantly strengthen the relationship between incivility and objective sleep quality ($\gamma = 4.46$, $p = .09$). As such, Hypothesis 10b was not supported.

Table 9: Incivility-subjective sleep quality moderated by EFC

Dependent Variable	Subjective Sleep Quality	
Model Parameter	Coefficient	SE
Intercept	2.90	0.86
Day-level		
Incivility	-0.11	0.14
EFC	-0.43*	0.20
IncivilityxEFC	0.20	0.31
Person-level		
Incivility	-0.93*	0.45
EFC	0.10	0.19
Gender	0.10	0.36
Age	0.04	0.02
Autonomy	-0.01	0.16
IncivilityxEFC	1.52**	0.49

Note. EFC = emotion-focused coping, IncivilityxEFC = interaction term between incivility and emotion-focused coping. $p < .05 = *$, $p < .01 = **$, $p < .001 = ***$. $N = 24$, Observations = 58.

Table 10: Incivility-objective sleep quality moderated by EFC

Dependent Variable	Objective Sleep Quality	
Model Parameter	Coefficient	SE
Intercept	90.45	1.59
Day-level		
Incivility	-0.46	1.21
EFC	-1.45	1.67
IncivilityxEFC	4.46	2.61
Person-level		
Incivility	-1.03	2.35
EFC	-0.66	1.36
Gender	-2.05	2.07
Age	0.15	0.11
Autonomy	0.45	0.73
IncivilityxEFC	2.77	1.44

Note. EFC = emotion-focused coping, IncivilityxEFC = interaction term between incivility and emotion-focused coping. $p < .05 = *$, $p < .01 = **$, $p < .001 = ***$. $N = 24$, Observations = 58.

CHAPTER 13: STUDY 2 DISCUSSION

Study 2 sought to re-examine the hypotheses from Study 1 but with a more rigorous daily-level research design that examined the moderating effect of stressor-specific problem- and emotion-focused coping strategies on the relationship between work stress (incivility and workload) on sleep quality, measured via both self-reports and actigraphy. Contrary to what was hypothesized, results indicated that participants' workload on a given day was unrelated to their sleep quality that night. Similarly, incivility experienced at work was unrelated to sleep quality that night. These findings were consistent for both self-reports of sleep quality and objective sleep quality as measured by the actigraph devices.

With respect to the moderator hypotheses, problem-focused coping did moderate the relationship between workload and sleep quality, but only for objective sleep quality. Additionally, the form of this moderator effect was not what was hypothesized. Specifically, at low levels of problem-focused coping the relationship between workload and sleep quality was negative at high levels of problem-focused coping. In contrast, the relationship between workload and sleep quality was positive. Moreover, the relationships were only significant at more extreme values of the moderator (-1.5 and +2.5 SD respectively). At average levels of the moderator, the relationship between workload and objective sleep quality was non-significant. Recall that it was hypothesized that the workload-sleep quality relationship would be strong and negative at low levels of problem-focused coping, and there would be a weaker negative relationship at high levels of problem-focused coping. Emotion-focused coping did not exacerbate the relationship between workload and subjective sleep quality. Finally, emotion-focused coping did not exacerbate the relationship between incivility and sleep quality.

One of the goals of Study 2 was to further investigate the impact of problem-focused and emotion-focused coping on the relationship between work stressors and sleep quality. The current study contributes to the stress literature by providing preliminary evidence that using more problem-focused coping strategies has the potential to impact the relationship between workload and objective sleep quality at the daily level. Results indicated that the relationship between daily workload and objective sleep quality was positive for individuals who used more problem-focused coping strategies. In comparison, the relationship was negative for individuals who utilized fewer problem-focused coping strategies.

Although the relationship between daily workload and objective sleep quality was positive for individuals who utilized more problem-focused coping strategies, it is important to note that individuals experienced worse objective sleep quality on days in which they experienced low workload and utilized problem-focused coping more frequently (Figure 4). In contrast, individuals experienced better objective sleep quality on days in which they had low workload and utilized fewer problem-focused coping strategies than average. Individuals who reported using more problem-focused coping strategies did experience better sleep quality on days when they had high workload, but the amount of sleep was comparable to days when they utilized fewer problem-focused coping strategies.

Sadeh et al. (2004) conducted one of the first studies investigating the impact of problem-focused and emotion-focused coping strategies in the context of stress and sleep quality. Specifically, their results indicated that during low and high stress periods (a heavy examination period), students who used more problem-focused coping strategies experienced better daily sleep quality than individuals who used emotion-focused coping strategies. Prior studies that drew from Lazarus and Folkman's conceptualization of coping have found that problem-focused

coping is beneficial in addressing work stress, buffering the relationship between work stress and sleep quality (Lewin & Sager, 2009). However, to date there have been few studies investigating the impact of problem-focused coping strategies on the relationship between certain work stressors and sleep quality at the day level.

The current study found that daily problem-focused coping moderated the relationship between workload and objective sleep quality. However, the nature of the interaction does not suggest that problem-focused coping strategies are beneficial across all quantities of workload. In fact, on days in which individuals used more problem-focused coping and experienced low workload, they experienced the worst sleep quality. The nature of this interaction suggests that using problem-focused coping could actually be counterproductive in some cases, at least with respect to sleep quality when coping with workload. These findings are surprising given the consistent findings that problem-focused coping strategies are beneficial for well-being (Chang et al., 2006; Lewin & Sager, 2009; Moskowitz et al., 2009). One explanation for this unexpected finding is that asking individuals to think about how they used problem-focused coping strategies to cope with their workload prompted them to think about how they will plan to deal with their workload the subsequent day. This may have functioned in a similar way to rumination which has been found to be a mechanism between stressors and sleep quality (Demskey et al., 2018). Another explanation for this finding is that the problem-focused coping measure had low reliability. Specifically, the coefficient alpha (.47) fell considerably low below the frequently considered acceptable value of .70 (Cortina, 1993). Therefore, although there was a significant interaction between daily problem-focused coping and workload on objective sleep quality, this finding should be interpreted with caution. Given the fact that past studies have supported the

benefits of problem-focused coping on different outcomes, further research on the impact of problem-focused coping on sleep is clearly needed.

It is also important to point out that this moderating effect was significant for the relationship between workload and objective sleep quality, but not subjective sleep quality. One explanation for this finding is that people are not accurate in estimating their sleep quality, as evidenced by the low correlation between self-reported sleep quality and actigraph results ($r = -.02$). Prior sleep studies have asked individuals to estimate their sleep duration and correlated those estimates with objective measures of sleep duration. Despite finding moderate correlations between subjective and objective sleep duration, some subpopulations tend to overestimate how long they slept, while others underestimate their sleep duration (Lauderdale et al., 2008). Prior research has also found that subjective measures and actigraphy may not converge because actigraphy measures sleep mostly based on movement and motor function (Lockley et al., 1999). When individuals are still, but awake, the actigraphs may misinterpret this lack of movement for sleep. Therefore, people may be unaware of the positive impact that increased use of problem-focused coping has on their daily sleep quality. Likewise, individuals who utilize fewer problem-focused coping strategies on given day may not recognize the negative impact this has on their daily sleep quality.

CHAPTER 14: GENERAL DISCUSSION

Theoretical implications

Having described the results of both studies individually, this section integrates findings from both studies to suggest how coping impacts stressor-strain relationships.

Stressor-sleep quality relationships

It was hypothesized that workload and incivility would be negatively related to sleep quality across studies. Study 1 found a negative relationship between both stressors (workload and incivility) and sleep quality. Prior research in the stress literature has called for more studies that investigate main effects of stressors on physical strain (Bowling & Kirkendall, 2012; Schilpzand et al., 2016). As such, the findings from Study 1 provide further evidence that these two stressors are negatively related to sleep. However, the second study did not find significant stressors-sleep quality relationships at the day level.

The lack of replication from the first study to the day level measurement of the constructs could certainly have been due to low power, which is discussed further in the limitations section. However, it may also be due to the fact that the impact of stressors such as workload and incivility on sleep is cumulative in nature. If this were the case, measuring sleep in close proximity to these stressors may not capture the effect.

Emotion-focused coping

The results of Study 1 supported the notion that emotion-focused coping strategies have the potential to negatively impact stressor-sleep quality relationships. Therefore, the first study provided preliminary evidence that emotion-focused coping exacerbates the relationship between stressors and sleep quality. These findings are consistent with prior research and theory

suggesting that emotion-focused coping is detrimental for individual well-being because the stressor is not alleviated and continues to be a source of stress (Lewin & Sager, 2009; Chang, 2012; Sriwilai & Charoensukmongkol, 2016). The first study may be capturing this phenomenon because participants were asked to reflect upon their experience of stress in the workplace over the last month. As such, individuals who relied more heavily upon emotion-focused coping may have experienced worse sleep-quality, than individuals who used fewer emotion-focused coping strategies, due to an increased duration in being exposed to work stress (i.e., workload and incivility).

In contrast, the second study did not find a significant effect of emotion-focused coping on the day level relationship between workload and sleep quality, nor on the relationship between incivility and sleep quality, regardless of how sleep quality was measured. Integrating the findings related to the effect of emotion-focused coping across both studies, it is possible that the second study did not find a significant effect of emotion-focused coping because it may take more time for incivility to impact one's sleep quality. However, over time if a person's workload or incivility are not alleviated, and emotion-focused coping is heavily relied upon, then this may result in worse sleep quality in the future.

Problem-focused coping

In contrast to the first study, the second study found that problem-focused coping moderated the day level relationship between workload and objective sleep quality, but not as expected. One possible reason that problem-focused coping did not buffer the relationship between workload and sleep in the first study is that coping was measured generally, rather than specific to the stressor the person was coping with. The second study sought to address this

potential issue by framing the coping items specifically to each of the two stressors. When coping was measured specific to the context in which the strategies were used, problem-focused coping did moderate relationship between daily workload and objective sleep quality.

Although the relationship was not moderated as expected, this finding does suggest that it is important to measure the context in which people use problem-focused coping strategies, rather than measuring solely the frequency in which they used problem-focused coping regardless of the context. Additionally, the present findings would suggest that problem-focused coping impacts one's daily experience of sleep quality, but that these findings may not be captured when individuals are asked to reflect upon their experience of work stress and coping approaches over the past month. However, the nature of the interaction was not as expected. The plot of the interaction (Figure 4) suggested that individuals who used more problem-focused coping strategies experienced worse sleep quality compared to days in which they used fewer problem-focused coping strategies to cope with their workload, especially when their workload was low. Individuals experienced better sleep quality when they used more problem-focused coping strategies only on days when they had high workload. Although, the quality of sleep was still comparable to days when they had high workload and used fewer problem-focused coping strategies. Another noteworthy finding is that the relationship was moderated only for sleep quality measured objectively.

Subjective versus objective sleep-quality

Interestingly, sleep-efficiency, which was measured with actigraphy, was not significantly correlated with self-report measures of sleep quality. This suggests that individuals may not be accurately assessing how well or poorly they sleep. This finding is important because

it implies that individuals experiencing high levels of work stressors may assume, they are sleeping poorly, when they are not. In fact, in the second study the relationship between workload and sleep-quality was positive for individuals who engaged in more problem-focused coping but was negative for individuals who used fewer problem-focused coping strategies. However, this finding was only found for sleep quality measured through actigraphy. Therefore, individuals may be unaware of the benefits they receive in terms of sleep quality when they use more problem-focused coping to deal with their workload and may also be unaware of the negative impact on their sleep quality when they fewer problem-focused coping strategies.

Practical implications

Based on findings from the first study, employees should be aware of how they cope with their work-related stressors. Specifically, the first study found that emotion-focused coping exacerbated the workload-sleep quality and, incivility- incivility-sleep quality relationships. Emotion-focused coping is certainly one-way individuals can address their work-related stress; however, it may not be effective in reducing stressor-strain relationships. As such, employees should engage in other behaviors to reduce the stress they experience at work. Recovery is a process that reduces the experience of strain from prior workplace stressors (Sonnentag et al., 2017). The stress literature has found that recovery behaviors, such as psychologically detaching from work (i.e., disconnecting from thoughts about work), are positively related to well-being and negatively to strain (Chawla et al., 2020; Sonnentag et al., 2017). Therefore, employees should strive to engage in recovery processes that help them return to levels of strain they were experiencing prior to experiencing of work-related stressors.

Strengths and limitations

One of the strengths of the current study is that hypotheses were tested using both a cross sectional and ESM design. As previously discussed, the use of retrospective self-report data had a multitude of flaws, namely that coping was measured generally as an individual's general tendency to use certain coping strategies over a month span. Moreover, because the variables were measured cross-sectionally, it could not be inferred that work stressors led to poor sleep quality. Therefore, the inclusion of the second study strengthened the research design by investigating the variables of interest at the daily level. That is, by measuring participants' work stress and coping in the evening and sleep quality in the morning, some causal inferences could be made about the relationship between work stress and sleep quality the following night.

A second strength of the study is that coping was measured specific to the stressors of the study. In prior studies that have examined problem-focused and emotion-focused coping, it is not uncommon to measure coping generally. That is, participants are often asked to report how frequently they used a certain coping strategy. However, the object of the coping strategy is sometimes not mentioned or is generally towards work stress. Study 2 avoided this issue by asking participants specifically how they used problem-focused and emotion-focused coping to cope with either incivility or workload.

A third strength of the study is the objective measurement of sleep in Study 2. Prior research has found that individuals' subjective experience of sleep can influence their well-being the following day, but it is also important to investigate how people's sleep quality is objectively impacted by work stress and coping. For example, prior research has found that poor sleep quality, measured by self-reports, has a multitude of repercussions on health, such as accidents in the workplace (Legree et al., 2003) or performance (Barnes, 2012; Durmer & Dinges, 2005;

Pilcher & Huffcutt, 1996). Yet, the inclusion of objective sleep in organizational research is less common.

Despite including the longitudinal research design and measurement of sleep quality as both subjective and objective, there are some noteworthy limitations. First, the sample used for the second study seemed to have a sporadic work schedule. Although this sample may have experienced the stressors and had to cope with them during work, it seems that most of them had sporadic work schedules, based on the amount of usable data for the lagged analyses. Compared to individuals with regular work schedules, this sample of working students may not have normal “nine-to-five” jobs like many working adults who do not also have to balance taking classes. As such, the amount of useable data for testing the analyses in Study 2 was less than ideal. Moreover, participants were provided with the option to indicate that they did not experience stress as a result of their workplace stressors on that day. Therefore, even if participants worked on a given day, they may not have provided responses answers to the coping items, which further limited the amount of useable observations.

On a similar note, the sample is problematic because the analyses for Study 2 are lacking in power compared to other published studies that have utilized ESM designs (Ohly et al., 2010). Because the number of observations was limited for the analyses, the current study was not able to detect small effect sizes. Therefore, despite using an ESM design to test the hypotheses, the study is limited in the amount of observations that were capable of being analyzed.

Finally, the problem-focused coping measures for both studies had reliability estimates well below .70, which is typically cited as the acceptable cutoff value for acceptable reliability (Cortina, 1993). The low reliability of the problem-focused coping measure is problematic for Study 1 because problem-focused coping may buffer the relationship between workload and

sleep quality, but the poor reliability of the measure prevented this from being shown statistically. In the second study, an effect was found for problem-focused coping on the relationship between daily workload and objective sleep quality. In this case, the significant moderating effect should be interpreted with caution because of the low reliability of the measure. In summary, findings concerning problem-focused coping in both studies should be interpreted with caution.

Future research

Future research should continue to investigate the effects of different coping strategies on relationships between work stressors and sleep quality. While the current studies investigated two commonly studied stressors, namely workload and incivility, researchers should investigate the impact of other stressors on employee sleep quality. Furthermore, findings from the current studies suggest that in future studies it is important to supplement self-report measures of sleep quality with objective measurement approaches such as actigraphy. More recently, it has become popular for people to wear fitness trackers. Many of these devices provide some index of objective sleep quality similar to actigraphs. Individuals clearly care about their objective sleep and future research should make efforts to better understand how responses to work stress, such as coping and recovery, can either benefit or detract from one's sleep.

Although the present findings contribute to the stress literature, there is still much that we do not know regarding the manner in which stressors, coping, and sleep quality are related. One avenue in the sleep literature that still needs to be explored is the effect of poor sleep quality on coping strategies the following day. For instance, Baumeister (2003) suggested that sleep quality functions in a similar way to ego depletion. Thus, future research should examine whether

individuals who are sleep deprived and feel depleted are more likely to cope with work stress ineffectively by disengaging or avoiding work, compared to individuals who feel well rested and may have the energy needed to cope more effectively with their workload.

Finally, although the second study suggested that problem-focused coping moderates the daily relationship between workload and objective sleep-quality, future research should replicate the findings of this study with a larger sample size. Therefore, it is important to not overstate the findings of the second study and emphasize that future research should try to replicate the findings of the current study.

Conclusion

In conclusion, the current study consisted of two parts: a cross sectional examination of the variables of interest as well as an ESM to more rigorously test the relationships at the day level that included both self-reports and objective measures of sleep quality. The cross-sectional study provided evidence that emotion-focused coping may be maladaptive when coping with work stress and exacerbate the relationship between work stressors and sleep quality. The ESM study found that problem-focused coping moderated the daily relationship between workload and objective sleep quality, but not as expected. Emotion-focused coping had no impact on the relationship between stressors and subjective and objective sleep quality. In summary, the current study provides some preliminary findings that problem-focused and emotion-focused coping may in fact differentially moderate the relationship between stressors and sleep quality.

APPENDIX A STUDY 1 MEASURES

INCIVILITY (8 items)

Cortina, L. M., Magley, V. J., Williams, J. H., & Langhout, R. D. (2001). Incivility in the workplace: Incidence and impact. *Journal of Occupational Health Psychology, 6*(1), 64-80.

Prompt: During the last month while employed, have you been in a situation where any of your supervisors or coworkers:

1. Put you down or was condescending to you?
2. Doubted your judgment on a matter over which you have responsibility?
3. Paid little attention to your statements or show little interest in your opinion?
4. Made demeaning or derogatory remarks about you?

1: Never	2: Rarely	3: Sometimes	4: Quite often	5: Extremely often
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SLEEP QUALITY (4 items)

Jenkins, C. D., Stanton, B. A., Niemcryk, S. J., & Rose, R. M. (1988). A scale for the estimation of sleep problems in clinical research. *Journal of Clinical Epidemiology, 41*(4), 313-321.

Prompt: Thinking about the past month, on how many days did you experience the following?

1. Had trouble falling asleep.
2. Had trouble staying asleep (including waking up early).
3. Woke up several times during the night.
4. Woke up after your usual amount of sleep feeling tired and worn out.

Never	1-3 days	4-7 days	8-14 days	15-21 days	22-31 days
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EMOTIONAL EXHAUSTION (3 items)

Frone, M. R., & Tidwell, M. C. O. (2015). The meaning and measurement of work fatigue: Development and evaluation of the Three-Dimensional Work Fatigue Inventory (3D-WFI). *Journal of Occupational Health Psychology, 20*(3), 273-288.

Prompt: Emotional fatigue involves extreme emotional tiredness and an inability to feel or show emotions. During the past month, how often did you...

1. Have difficulty showing and dealing with emotions at the end of the workday?
2. Feel emotionally worn out at the end of the work day?
3. Want to avoid anything that took too much emotional energy at the end of the workday?

1: Never	2: Rarely	3: Sometimes	4: Quite often	5: Extremely often
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QUANTITATIVE WORKLOAD INVENTORY (5 items)

Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: interpersonal conflict at work scale, organizational constraints scale, quantitative workload inventory, and physical symptoms inventory. *Journal of Occupational Health Psychology*, 3(4), 356-367.

Prompt: How often does the following occur at your job?

1. How often does your job require you to work very fast?
2. How often does your job require you to work very hard?
3. How often does your job leave you with little time to get things done?
4. How often is there a great deal to be done?
5. How often do you have to do more work than you can do well?

1: Never	2: Rarely	3: Sometimes	4: Quite often	5: Extremely often
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COPING (8 items)

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2), 267-283.

Prompt: We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what YOU generally do and feel, when YOU experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you USUALLY do when you are under a lot of stress.

1. I try to come up with a strategy about what to do.
2. I force myself to wait for the right time to do something.
3. I put aside other activities in order to concentrate on this.
4. I make a plan of action.
5. I talk to someone about how I feel.
6. I try to get emotional support from friends or relatives.
7. I get upset and let my emotions out.
8. I let my feelings out.

1: Strongly disagree	2: Disagree	3: Undecided	4: Agree	5: Strongly agree
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APPENDIX B: STUDY 2 MEASURES

COPING (6 items)

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2), 267-283.

Prompt: Please indicate how you coped with your workload (incivility) today.

Participants were allowed to express that they did not experience stress as a result from their workload or experience of incivility (first option on the scale).

Problem-Focused Coping

1. I tried to come up with a strategy about what to do.
2. I forced myself to wait for the right time to do something.
3. I put aside other activities in order to concentrate on it.

Emotion-Focused Coping

4. I talked to someone about how I feel.
5. I got upset and let my emotions out.
6. I let my feelings out.

My workload was not a source of stress for me today/ Incivility from my coworkers or supervisor was not a source of stress for me today	1: Never	2: Sometimes	3: Not very frequently	4: Frequently	5: Very Frequently
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SUBJECTIVE SLEEP QUALITY (4 items)

Scott, B. A., & Judge, T. A. (2006). Insomnia, emotions, and job satisfaction: A multilevel study. *Journal of Management*, 32(5), 622-645.

Prompt: To what extent did you experience the following symptoms last night?

1. Had trouble falling asleep?
2. Had trouble staying asleep?
3. Woke up several times throughout the night?
4. Woke up after your usual amount of sleep feeling tired and worn out?

1: To a very small extent	2: To a small extent	3: To some extent	4: To a large extent	5: To a very large extent
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OBJECTIVE SLEEP QUALITY

Was assessed by calculating sleep efficiency in Actilife with the Sadeh algorithm. Sleep efficiency is a ratio of time asleep to time in bed and can range from 0-100.

WORKLOAD (5 items)

Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: interpersonal conflict at work scale, organizational constraints scale, quantitative workload inventory, and physical symptoms inventory. *Journal of Occupational Health Psychology*, 3(4), 356-367.

Prompt: Please indicate the degree to which you agree with each statement regarding your workload today.

1. My job required me to work fast.
2. My job required me to work very hard.
3. I felt like I had little time to get things done.
4. There was a great deal to get done.
5. I had more work to do than I could do well.

1: Strongly Disagree	2: Disagree	3: Neither agree nor disagree	4: Agree	5: Strongly Agree
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INCIVILITY (4 items)

Cortina, L. M., Magley, V. J., Williams, J. H., & Langhout, R. D. (2001). Incivility in the workplace: Incidence and impact. *Journal of Occupational Health Psychology*, 6(1), 64-80.

Prompt: During today’s workday, have you been in a situation where any of your superiors or coworkers:

1. Put you down or was condescending to you?
2. Doubted your judgment on a matter over which you have responsibility?
3. Paid little attention to your statements or showed little interest in your opinion?
4. Made demeaning or derogatory remarks about you?

1: Never (0)	2: Rarely (1)	3: Sometimes (2)	4: Often (3)	5: Very frequently (4 or more)
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AUTONOMY (3 items)

Hackman, J. R., & Oldham, G. R. (1974). The Job Diagnostic Survey: An instrument for the diagnosis of jobs and the evaluation of job redesign projects.

Prompt: How accurate is the statement in describing your job?

1. The job denies me any chance to use my personal initiative or judgment in carrying out the work.
2. The job gives me considerable opportunity for independence and freedom in how I do the work.
3. The job allows significant autonomy, permitting me to decide on my own how to go about doing the work.

1: Very inaccurate	2: Mostly inaccurate	3: Slightly inaccurate	4: Uncertain	5: Slightly accurate	6: Mostly accurate	7: Very accurate
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APPENDIX C: IRB APPROVAL



UNIVERSITY OF CENTRAL FLORIDA

Institutional Review Board
FWA00000351
IRB00001138, IRB00012110
Office of Research
12201 Research Parkway
Orlando, FL 32826-3246

Memorandum

To: Wheeler Nakahara
From: UCF Institutional Review Board (IRB)
CC: Steve Jex
Barbara Fritzsche
Nathalia Bauer
Date: March 26, 2020
Re: Request for IRB Determination

The IRB reviewed the information related to your thesis, *Workplace Stress and Sleep Quality: The Differential Moderating Effects of Problem- and Emotion-Focused Coping*.

Your project data is covered under the following protocols previously approved by the IRB. You are listed as a study team member on both of the studies and your use of the de-identified secondary data is not restricted by the protocols.

IRB study name (project title)	IRB Approval Number
Sleep & the Workplace	SBE-18-13926
Work-nonwork Interface, Coping, Healthy Behaviors	SBE-18-14272

If you have any questions, please contact the UCF IRB irb@ucf.edu.

Sincerely,

Renea Carver
IRB Manager

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