RELATIONSHIPS BETWEEN INCIVILITY AND PHYSICAL HEALTH: THE MEDIATING EFFECT OF SLEEP AND MODERATING EFFECTS OF HOSTILE ATTRIBUTION BIAS AND RUMINATION IN A SAMPLE OF NURSES

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ABSTRACT

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The current study is an investigation of the relationships between perceived incivility, sleep quality and quantity, and physical health outcomes, as well as the moderating effects of work-related rumination and hostile attribution bias. The author proposed based on self-regulatory theory (Muraven & Beaumeister, 2000) and conservation of resources theory (Hobfoll, 1989) that incivility has negative effects on physical symptoms through the mediating effects of sleep quality and quantity, and that individual difference variables would amplify the direct effects between incivility, sleep, and physical symptoms. Study results based on data from a sample of Ohio nurses (n = 456) provided mixed support for the hypotheses. Specifically, the study found support for sleep quality and quantity as full mediators, but no support for the hypothesized individual difference moderators. Study implications and limitations are discussed.

Keywords: Workplace Incivility, Sleep, Physical Symptoms, Nursing, Rumination, Hostile Attribution Bias

Dedicated to my family and friends for all their love and support throughout this project.

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INTRODUCTION

Given its prevalence and its negative effects on people and workgroups throughout organizations, workplace incivility is an important topic of interest for researchers and practitioners alike (Bowling & Beehr, 2006). Incivility was first discussed by Andersson and Pearson in 1999. They defined incivility as "low intensity, deviant behavior with ambiguous intent to harm the target, in violation of workplace norms of mutual respect. Uncivil behaviors are characteristically rude and discourteous, displaying a lack of regard for others" (p. 457). Some examples of uncivil conduct include sarcasm, making critical remarks, making jokes, interrupting, staring at others, and giving the silent treatment. Uncivil behaviors are characterized by being low-level, relative to more serious forms of mistreatment, and ambiguous in nature (Andersson & Perason, 1999). Workplace incivility is a unique construct within the field of workplace mistreatment, differing from related constructs such as bullying and social undermining, which involve a clear intent to harm. Moreover, incivility reflects peoples' interpretations about how actions make them feel: even though an uncivil behavior may be unintentional, it is defined by the person interpreting the behavior (Porath & Pearson, 2009). Incivility is also the most common type of mistreatment in the workplace: in their 2001 study, Cortina, Magley, Williams, and Langhout found that more than 70% of 800 surveyed employees reported experiencing incivility at work within the previous five years (Cortina et al., 2001). The high prevalence rate of incivility is a growing concern for organizations: estimates have shown that incivility can cost businesses up to $14,000 a year per employee due to distraction, loss of work time, and project delays (Porath & Pearson, 2010).

Uncivil behaviors, when interpreted negatively by victims, can have serious, negative effects on both victims and organizations alike. Some well-established negative outcomes of

workplace incivility include decreased levels of employee health and job satisfaction (Cortina, Magley, Williams & Langhout, 2001; Leiter, Laschinger, Day, & Oore, 2011; Lim, Cortina & Magley, 2008), organizational productivity (Estes & Wang, 2008) and organizational commitment (Pearson & Porath, 2005), as well as increased levels of employee turnover (Lim, Cortina & Magley, 2008; Reio & Ghosh, 2009), stress (Ferguson, 2012; Penney & Spector, 2005), strain (Raver & Nishii, 2010), and emotional exhaustion (Cortina et al., 2001; Leiter et al., 2011; Sliter, Jex, Wolford, & McInnerney, 2010). Furthermore, bystanders who witness incivility can also experience negative outcomes: a study by Porath, MacInnis and Folkes (2011) found that customers who witnessed uncivil interactions between service employees developed negative evaluations about the organization, and experienced anger. While findings suggest the myriad negative outcomes of incivility, attention must be given to other potential outcomes of incivility that have had little focus, including the effect that incivility has on sleep and physical health outcomes.

Incivility research has also shown that the construct has a significantly higher precedence in specific settings, including those that require frequent interpersonal contact for employees. Research conducted in health care settings has shown that incivility in such settings has an even stronger relationship with the previously discussed negative outcomes. Due to the higher prevalence of workplace mistreatment within health care jobs, especially nursing, incivility studied specifically within health care settings has become a salient research area recently. Estimates of incivility within hospitals are as high as 9 out of 10 nurses reporting experiencing verbal abuse at work (Winstanley & Whittington, 2002). Incivility experienced by nurses has been found to directly impact patient care outcomes. As many as 75% of health care providers saw a strong link between disruptive behavior from coworkers, supervisors, doctors or other

nurses (i.e., verbal abuse and incivility) and adverse outcomes such as patient safety, errors, adverse events, quality of care, and patient satisfaction (Rosenstein & O'Daniel, 2005). Also, nurse perceptions of supervisor incivility have been directly related to turnover intentions (Spence-Laschinger, Leiter, Day & Gilin, 2009), as well as perceptions of poor working relations between nurses and physicians (Rosenstein and O'Daniel 2002, 2005).

The negative outcomes of incivility are further supported by related research on other, similar types of negative workplace treatment: A comprehensive meta-analysis by Bowling and Beehr (2006) found many similar correlates of workplace harassment. Harassment is distinct from incivility in that it involves a clear intention to cause harm to another employee; however, both harassment and incivility cause a negative stress response, which can lead to similar outcomes. Results of this meta-analysis showed that workplace harassment was associated with victims' well-being: specifically, harassment was positively associated with strains, anxiety, depression, burnout, frustration, negative emotions at work, and physical symptoms. Harassment was negatively associated with positive emotions at work, self-esteem, life satisfaction, job satisfaction, and organizational commitment (Bowling & Beehr, 2006).

The myriad negative outcomes of incivility as well as its surprisingly common occurrence, especially within health care settings, indicate the importance of better understanding the relationships between incivility, sleep, and physical symptoms. Clearly, the prior 16 years of research have contributed to a solid knowledge of incivility's antecedents and outcomes; however, investigation into the mechanisms responsible for the relationship between incivility, sleep, and physical symptoms is scarce in the literature, and warranted: the National Institutes of Health has called for greater exploration of the associations between job-related stressors and sleep quality (Knudsen, Ducharme & Roman, 2007). Moreover, research has yet to

explore how the individual difference variables of rumination and hostile attribution bias may affect these relationships. The current study builds on previous pilot research (Bayne & Jex, 2015), and aims to examine the relationship between perceived workplace incivility and the outcome of physical health symptoms, as well as how sleep quality and sleep quantity affect this relationship, within a population of nurses. Within this relationship, the study will explore how rumination and hostile attribution bias may affect the relationship between incivility, sleep, and physical symptoms.

RELEVANT RESEARCH

Defining Workplace Incivility

As a relatively new and important avenue of study in the occupational health field, incivility has been the subject of much research and debate over both its definition and where it fits within the realm of negative workplace behaviors. Incivility is completely distinct from physical aggression and violence; however, depending on the situation, the definition of incivility can overlap with psychological aggression. When there is clear intention to harm a target or organization, then uncivil behavior overlaps with psychological aggression. When behaviors lack clear intention – or, in other words, are ambiguous – incivility is distinct from the psychological aggression construct, as outcomes of such behaviors may result in accidental harm, which differs from the current definitions of psychological aggression (e.g., Lawrence & Leather, 1999; Lawrence & Leather, 2003).

Broadly, incivility is a type of *antisocial employee behavior*, which is defined as "any behavior that brings harm, or is intended to bring harm, to an organization, its employees, or its stakeholders," (Giacalone & Greenberg, 1997, pg. vii). More specifically, incivility can be categorized within antisocial employee behavior as a type of employee deviance. *Employee deviance* is defined as "voluntary behavior that violates significant organizational norms and in so doing threatens the well-being of an organization, its members, or both" (Robinson & Bennett, 1995, p. 556).

Based on Andersson and Pearson's definition, the three key aspects of incivility include *norm violation*, *ambiguous intent*, and that it is *low intensity* (Pearson, Andersson, & Wegner, 2001). Each of these key characteristics helps to distinguish incivility from other types of workplace deviance. First, *norm violation* refers to behaviors that disturb mutual respect within

the workplace. The definition of workplace incivility implies that uncivil behavior disrupts mutual respect within a workplace, even though norms may differ from one organization to the next (Lim, Cortina, & Magley, 2008).

Second, *ambiguous intent* is the characteristic of incivility that helps to separate the construct from other forms of workplace aggression. Aggression is typically defined as involving a clear intent to harm someone, either physically or psychologically (Neumann & Barron, 1998). It is possible for uncivil behavior to overlap with subtle or psychological forms of aggression if it is motivated by a desire to harm others or the organization (e.g., Bjorkqvist, Osterman, & Lagerspetz, 1994), but uncivil acts are distinct from aggression if the perpetrator lacks any clear intent to harm. Rather than direct intent to harm, perpetrators may act uncivil for other reasons, such as ignorance, oversight, or personality (Andersson & Pearson, 1999; Pearson et al., 2001). Because harm resulting from these uncivil acts may be accidental, rather than intentional, victims may experience distress due to difficulty in understanding the situation, deciding how and whether to respond, as well as uncertainty about what behaviors they are likely to experience in the future.

Third, *low intensity* refers to the low-level quality of uncivil behavior. That is, incivility is at a lower magnitude of deviance than aggression (Pearson et al., 2001), and can even involve nonverbal behaviors, such as staring at, rolling one's eyes at, and/or ignoring, colleagues. However, while incivility is a low-level negative behavior, Andersson and Pearson (1999) suggested that a series of uncivil encounters may result in an upward "incivility spiral" of negative organizational events that may eventually lead to a tipping point and, as a result, acts of more serious workplace aggression. Both psychologists and criminologists have found that interpersonal violence often begins with rude comments and minor mistreatment (Felson &

Steadman, 1983; Goldstein, 1994). In this way, even minor transgressions can result in larger-scale organizational conflict over time.

In characteristically violating norms, involving ambiguous intent to harm, and being low in intensity, incivility stands out in comparison to other workplace aggression constructs, such as social undermining (Duffy, Ganster & Pagon, 2002), bullying (Hoel & Cooper, 2001), abusive supervision (Tepper, 2007), and interpersonal conflict (Spector and Jex, 1998). *Social undermining* is any "behavior intended to hinder, over time, the ability to establish and maintain positive interpersonal relationships, work- related success, and favorable reputation," (Duffy, Ganster & Pagon, 2002). Both a clear intention as well as effects on specific outcomes, such as relationships, work-related success, and reputation, characterize social undermining. *Bullying* is defined as "instances where an employee is repeatedly and over a period of time exposed to negative acts (i.e., constant abuse, offensive remarks or teasing, ridicule, or social exclusion) from co- workers, supervisors, or subordinates," (Einarsen, 2000; Hershcovis, 2011). The defining characteristics of this form of mistreatment include its persistence over time, its frequency, and the power imbalance between the perpetrator and victim. Bullying additionally involves clear intent to harm. Lastly, *interpersonal conflict* is an organizational stressor that involves disagreement between employees (Spector & Jex, 1998). Whereas study of other constructs in the workplace mistreatment literature involves outcomes of the constructs, interpersonal conflict is meant as a measure of a mutually stressful interaction itself, rather than the outcome. However, the construct has been regularly included in mistreatment research, and was included in Bowling and Beehr's (2006) meta-analysis on correlates of harassment.

Clearly, incivility can have detrimental effects in organizations, including on employees' physical health. In particular, there are several potential variables that mediate the relationship

between incivility and physical health outcomes; in addition, other variables may moderate this relationship. These potential mediating and moderating variables will now be discussed in turn.

Mediators of the Relationship between Incivility and Physical Health

Mental health. The small amount of incivility research examining physical health has examined even fewer possible mediators of the relationship. An important mediator between incivility and physical health is mental health. Recently, Lim, Cortina and Magley (2008) found that the relationship between incivility and negative physical health outcomes was partially mediated by both job satisfaction and mental health symptoms. However, mental and physical health are reciprocally linked, and while mental health can lead to and even worsen problems with physical health, physical health problems can also result in decreased mental health. For example, a 4-year, three-wave study on the relationship between physical and mental health showed that physical health had positive cross-lagged effects on mental health. This suggested that low levels of physical health predicted decreases in mental health (Hays, Marshall, Wang, & Sherbourne, 1994).

Appraisals. Another mediator of the relationship between incivility and physical symptoms is the appraisal of the uncivil encounter: the way that a victim interprets and appraises an ambiguous, uncivil event ultimately influences their psychological and physiological response to the encounter. Lazarus and Folkman's (1984) *transactional model of stress* states than an person's experience of stress is a product of the interaction between the environment and the person's perceptions, and that one's *primary* and *secondary appraisals* of the event determine whether the event is interpreted as a stressor. First, in order for an event to become a stressor, it must be perceived as threatening by the person (primary appraisal). Second, this judgment is modified by whether or not the person perceives they have enough psychological or physical

resources to cope with the event (secondary appraisal). If an event is appraised as stressful and the person is unable to cope with the stressor, they may experience strain outcomes.

Moderators of the Relationship between Incivility and Physical Health

Negative affectivity. As previously stated, the small amount of research on the relationship between incivility and physical health has not examined many moderators of this relationship. However, negative affectivity (NA) is a potential moderator of this relationship. NA is a broad dimension of subjective distress that includes many different mood states such as anger, contempt, disgust, guilt, fear, and nervousness. Moreover, NA is related with an affective trait dimension of negative emotional reactivity, which corresponds with anxiety and neuroticism (Watson, Clark, & Tellegen, 1988).

Andersson and Pearson (1999) discussed negative affect within their original conceptualization of incivility, stating that feelings of negative affect in response to an uncivil act could increase the likelihood of an incivility spiral occurring. Moreover, research has shown that NA is positively related to occurrences of workplace incivility (Burnfield, Clark, Devendorf, & Jex, 2004), and other forms of workplace harassment (Bowling & Beehr, 2006). In addition, recent research has found that persons high on NA may be perceived more negatively by his or her co-workers, and experience higher levels of incivility than persons who are low in NA (Milam, Spitzmueller, & Penney, 2009). It is important to note that NA can impact both the recollection of incivility as well as whether or not it occurs.

Defining Sleep within the Organizational Literature

Sleep is defined as a recurring state of immobility with greatly reduced responsiveness, and can be distinguished from other states of immobility, such as coma or anesthesia, by its rapid reversibility (Siegel, 2005). Humans spend about a third of their lifetimes sleeping, and

important restorative and healing processes take place during the sleep cycle. Despite the importance of sleep within the understanding of human health, only recently have applied psychologists and management researchers begun to examine the relevance of sleep to organizational variables. However, important relationships between sleep, stress and health have already been found (Mullan, 2014). For instance, sleep has been described as an important part of the *work recovery process* (e.g., Barber & Jenkins, 2014; Pereira & Elfering, 2014; Pereira, Meier, & Elfering, 2013). These researchers have posited that exposure to job demands causes mental and physical depletion, and that recovery is a reversal of the stressor process that allows people to return to their pre-stressor state. Sleep is characterized within the model as one strategy for achieving sufficient recovery. Lack of sleep leaves people less energized to exert effort on future job demands (Barber, 2014).

Sleep has also been conceptualized as an important mechanism within *self-regulatory theory*, in that a lack of sleep influences stress and behavior through a loss of self-control (e.g., Barber & Munz, 2011; Barber, Munz, Bagsby, & Powell, 2010; Barber, Grawitch & Munz, 2013; Hagger, 2010). Self-regulatory theory describes self-control as an effortful process through which people can set their feelings, thoughts and behaviors to a given standard (Muraven & Baumeister, 2000). Similar to the characterization within the work recovery process, sleep is one strategy for replenishing self-control. Indeed, research has linked better sleep to increased self-regulatory behavior (Barber & Munz, 2011). This research also found that sleep issues precede changes in self-control, rather than follow them (Barber & Munz, 2011). Given sleep insufficiency leads to decreases in regulatory behavior, it follows that sleepy individuals would be less likely to self-regulate positive health behaviors due to a lack of resources. The self-regulatory model relates to resource-based stress models such as conservation of resources

(COR) theory (Hobfoll, 1989), which focuses on the extent to which people are able to maintain resources and use them as tools to achieve desirable states. COR theory additionally implies that loss or threatened loss of resources results in lowered ability to cope as well as psychological distress and that, in turn, replenished resources will increase coping ability and lower stress (Hobfoll, 1989).

Of particular relevance to the current study, sleep has been related to physical health outcomes: Benham (2010) found that sleep variables increased the prediction of physical symptoms 17-26% beyond the influence of stress. However, sleep has been suggested as a buffer of this finding: by increasing regulatory strength, consistent sleep has been suggested as an effective strain intervention that can buffer against both acute and chronic health effects (Barber et al., 2010).

HYPOTHESIS DEVELOPMENT

Physical Health Outcomes of Incivility

As previously discussed, incivility has been extensively studied as a unique form of employee deviance. However, there has been limited research on how incivility affects physical health-related outcomes, and research on how individual differences affect peoples' experiences with the construct has also been scarce. However, previous studies have shown that targets of uncivil behavior are at risk for general increased physical and psychological distress (Cortina et al., 2001; Lim et al., 2008; Dion, 2006). Additionally, Bowling and Beehr (2006) found a moderate correlation between workplace harassment and physical symptoms (Mean $\rho = .31$; Bowling & Beehr, 2006, pg. 1004). Incivility's relationship with increased psychological distress is consistent with the finding that daily hassles (such as uncivil encounters) can overpower more infrequent but salient life stressors in predicted outcomes such as lowered morale, decreased social functioning, and psychosomatic symptoms (Lazarus and Folkman, 1994; Ganster & Schaubroeck, 1991). Thus, uncivil encounters may create effects similar to that of a chronic stressor, which can lead to serious physical and psychological outcomes. Based on the positive relationship between experiences of incivility and psychosomatic symptoms, it is hypothesized that:

> *Hypothesis 1* (H1): Levels of perceived incivility will be positively related to physical symptoms.

Sleep as a Mediating Mechanism between Incivility and Physical Health

The direct relationship between incivility and sleep quality has been studied infrequently, (e.g., Estes & Wang, 2008; Gilin Oore et al., 2010; Yamada, 2000), but existing findings suggest that incivility is negatively related to sleep quality. Sleep disturbances and loss of sleep have

previously been directly negatively linked to experiences of workplace incivility (Yamada, 2000). Incivility can be characterized as a stressor within the stress-strain framework, and impaired sleep quality has been empirically tested and shown to be a strain outcome by the National Institutes of Health (Knudsen, Ducharme & Roman, 2007). Previous research has also shown that workplace bullying, a higher-level form of workplace mistreatment, has been associated with impaired sleep quality (Niedhammer, David, Degioanni, Drummond, & Philip, 2009).

In addition to research on sleep as an outcome of uncivil experiences, sleep quality and quantity have also been studied as an antecedent of physical health outcomes. As previously discussed, sleep is an important component in the restoration of depleted resources. Research has linked better sleep to increased self-regulatory behavior (Barber & Munz, 2011), suggesting that a lack of sleep provides less restorative time for the body to reacquire regulatory resources. Limited regulatory resources can produce negative physiological effects on people, as they are less likely to make positive health-related choices (Vohs & Baumeister, 2011). Research has additionally shown that sleep insufficiency is directly related to physical health outcomes, such as physical distress, pain, and physical limitations (Pilcher, Ginter & Sadowski, 1997; Strine & Chapman, 2005). Based on the prior findings of a negative relationship between workplace incivility and sleep quality, as well as the established relationship between sleep insufficiency and physical health outcomes, it is hypothesized that:

Hypothesis 2: Levels of overall perceived incivility will be negatively related to sleep quality and quantity.

Hypothesis 3: Sleep quality and quantity will mediate the relationship between perceived incivility and health outcomes. Specifically, it is expected that the

relationship between incivility and physical symptoms will decrease substantially when sleep quality and quantity are controlled.

Moderating Mechanisms between Incivility and Physical Health

Work-related rumination. Rumination is an individual difference construct that may help to explain the relationships between experiences of incivility, sleep outcomes, and physical health outcomes. Rumination is a type of self-reflection that describes unintentional, preservative thoughts in the absence of external cues (Cropley & Purvis, 2003). It has been commonly studied outside of organizational research within clinical and health psychology settings, and has been linked to the recovery process through its relationship with a number of stress-related disorders, including physical symptom reporting (Hazlett & Haynes, 1992). However, research linking rumination to the organizational mistreatment literature is sparse, and the construct has only recently been applied as an explanatory mechanism between the current relationships of interest. In a study on the relationship between social exclusion, worries about work, and sleep outcomes, it was found that daily workplace social exclusion and work-related worries were positively related to sleep fragmentation the following night (Pereira, Meier, & Elfering, 2013). Also, in a recent study by Shapiro (2013), stress-reactive rumination was introduced as a mechanism in the organizational mistreatment literature. In this study, stress-reactive rumination was found to mediate the relationship between experienced incivility and performance outcomes such that when incivility occurred, an individual's tendency to ruminate increased, and performance was impaired as a consequence (Shapiro, 2013).

Research also suggests that people faced with stressful working conditions engage in more ruminative thinking after work, and take longer to relax psychologically (Cropley & Purvis, 2003). This extended physiological reaction can have negative health consequences:

studies have shown that worry, rumination, and anticipatory stress can act directly on disease through activation of cardiovascular, endocrinological, immunological, and neurovisceral activity that is maintained by these stress processes (Brosschot, Gerin, & Thayer, 2006). Ruminative thinking can be conceptualized a resource-consuming experience (Binneweis, Sonnentag & Mojza, 2009; Fritz & Sonnentag, 2006) within the conservation of resources framework because reflecting about the negative aspects of one's job, such as uncivil encounters over the course of the day, should deplete resources as the stressor remains mentally present during leisure time (Hobfoll, 1989). Individuals may experience prolonged activation when negatively reflecting about work (Brosschot, Pieper, & Thayer, 2005). Also, because negative work reflections are a negative experience, work related worries alone should increase negative affect and reduce self-efficacy (Bandura, 1997). Thus, by activating and lengthening the physiological reaction to stress, and by depleting resources, rumination can indirectly affect sleep quality and physical symptom outcomes (Brosschot, van Dijk, & Thayer, 2007).

Some research has already examined the relationship between stress, worries, and sleep quality. This research has shown that peoples' inability to stop worrying in their free time might be a link between chronic stressors and impaired sleep quality (Åkerstedt, Fredlund, Gillberg, & Jansson, 2002; Cropley, Dijk, & Stanley, 2006). However, additional insight into the effects of daily stressors on the relationship between worries and sleep quality is warranted (Åkerstedt, Kecklund, & Axelsson, 2007; Åkerstedt, et al., 2002). Examining rumination in a moderating and organizational context would be a novel addition to both organizational literature and the literature on sleep quality.

As previously discussed, incivility has been recognized as a stressor within the stressor-strain model (Bowling & Beehr, 2006). Considering work-related rumination, experiencing a

stressful event such as an act of incivility in the workplace may cause the target of the uncivil act to dwell on the occurrence. Whether or not an individual ruminates has been shown to be affected by individual differences in self-reflective tendencies (e.g., Watkins & Baracaia, 2001; Watkins, 2004), and people who feel the need to understand the context of an occurrence may be more likely to ruminate on an experience of incivility. Furthermore, because incivility involves ambiguous intent (Andersson & Pearson, 1999), individuals who are targets of incivility may feel uncertain about the meaning or intent of the occurrence. Whereas targets see unambiguous deviant events (e.g., aggression and bullying) as having clear intent and would not ruminate, uncivil events may be related to greater experiences of rumination and thus greater experiences of sleep impairment and physical symptoms.

Hypothesis 4: Work-related rumination will moderate the relationship between perceived incivility and sleep quantity and quantity such that greater levels of work-related rumination will strengthen the relationship between incivility and sleep quality and quantity.

Hypothesis 5: Work-related rumination will moderate the relationship between perceived incivility and health outcomes such that greater levels of work-related rumination will strengthen the relationship between incivility and health outcomes.

Hostile attribution bias. Hostile attribution bias is a type of cognitive bias that refers to systematic errors made when people evaluate or try to find reasons for others' behaviors (Kelley, 1967). Specifically, it refers to the tendency for an individual to appraise external events as signaling hostility from others. A stable individual difference variable, hostile attribution bias indicates how a person's cognitive appraisal of negative outcomes may predict anger and subsequent aggression (Adams & John, 1997; Dodge & Coie, 1987; Douglas & Martinko, 2001).

Attributional styles, including hostile attribution bias, are related to, but distinct from, other salient organizational research constructs (e.g., negative affectivity) that may moderate or mediate the relationships between incivility, sleep, and physical symptoms. Unlike negative affectivity, which is related to subjective distress, hostile attribution bias refers to a cognitive process that affects a person's appraisal of an event. Studies have found a direct link between hostile attribution bias and trait anger (Wilkowski & Robinson, 2008); however, little research has examined the subtle differences between hostile attribution bias and trait anger. Research has shown that interventions aimed at decreasing hostile attribution bias have been found to also reduce anger and aggression (e.g., Guerra & Slaby, 1990; Hudley & Graham, 1993).

Literature has suggested that the likelihood of individuals responding aggressively to negative situations depends partly on their judgment causality (Greenberg & Alge, 1998; Mack, Shannon, Quick, & Quick, 1998; Martinko & Zellars, 1998; Neuman & Baron, 1998; Weiner, 1995). That is, individuals may respond differently to situations depending on where they attribute the cause of the negative situation. Research has shown that attributions and attributional styles are related to behavior in organizations. Specifically, aggressive participants exhibit a greater tendency to attribute hostile intent to others' actions even when the "perpetrator's" actions are ambiguous (Dodge and Coie, 1987; Nasby, Hayden & DePaulo, 1980). Given that incivility is characterized by an ambiguous intent to harm, individuals with differing attributional styles may respond differently to uncivil events.

> *Hypothesis 6*: Hostile attribution bias will moderate the relationship between perceived incivility and sleep quality and quantity such that greater levels of hostile attribution bias will strengthen the relationship between incivility and sleep quality and quantity.

Hypothesis 7: Hostile attribution bias will moderate the relationship between perceived incivility and physical symptoms such that greater levels of hostile attribution bias will strengthen the relationship between incivility and physical symptoms.

Exploratory Analyses

The current study seeks to examine the way sleep affects the relationship between workplace incivility and health outcomes, and how rumination and hostile attribution bias may amplify the relationship between perceived mistreatment and health outcomes. The relationships under examination in the present study have been investigated only rarely, and will be explored within a nursing population for several reasons. First, incivility has a high prevalence in nursing environments. Estimates indicate that up to 9 out of 10 nurses report experiencing verbal abuse at work (Winstanley & Whittington, 2002). Outcomes of incivility generalize to the nursing population, but because of the prevalence of incivility, may be seen more acutely in nurses. For example, researchers have found that verbal abuse (including incivility) contributes to 16 to 24 percent of staff turnover (Braun, Christle, Walker, & Tiwanak, 1991; Cox 1987, 1991; Sofield & Salmond, 2003). Moreover, verbal abuse has specifically been tied to decreased morale, increased job dissatisfaction, and creation of a hostile work climate for nurses (Aiken et al, 2001; Cox, 1987; Manderino & Berkey, 1997, Sofield & Salmond, 2003).

There are many different potential sources of incivility for nurses. As is the case with all forms of aggression, it is important to understand not only the incidence and impact of aggressive encounters, but also who targets and perpetrators tend to be (e.g., Barling, 1996; Cortina et al., 2001). Nurses regularly interact with individuals in different roles and levels of power, including physicians, supervisors, peers, and patients (including patients' families and

visitors). According to social power theory, society confers certain levels of power upon certain individuals according to social expectations and norms as well as an individual's access to resources. Moreover, individuals who lack resources are more likely to have power exerted against them. In hospitals, nurses may exist at a different power base than other hospital employees, and could be vulnerable to power differentials (e.g., Carli, 1999; Bjorkqvist, Osterman, & Lagerspetz, 1994).

In studies of general verbal abuse in nurses, physicians have been identified as primary perpetrators of verbal abuse, however patients and their families, peers, and supervisors are also potential perpetrators of verbally abusive behavior (Braun, Christle, Walker & Tiwanak, 1991; Cook, Green & Troop, 2001; Cox, 1991; Sofield and Salmond, 2003). Given that incivility is a low-level form of verbal abuse, it is of interest to examine how the source of perceived incivility affects the phenomenon's impact on outcomes.

Research Question: How does the source of incivility (physician, supervisor, peer, or patient) affect its relationship with sleep and health outcomes?

METHOD

Participants and Procedure

Participants were registered nurses sampled from the Ohio Board of Nursing mailing list, which includes 200,000 email addresses. Emails were sent to 40,000 potential participants. Screening items for the current study included being employed full-time as a nurse and primarily working the day shift. Participants who meet these criteria were given informed consent and allowed to complete the survey. Participants who agreed to informed consent were instructed to complete questionnaires on nursing incivility, rumination, hostile attribution bias, sleep quality and quantity, and physical symptoms. In exchange for their participation, participants were eligible to enter their email address into a raffle for one of ten $30 Amazon gift cards.

Measures

See Appendix A for a full list of measures and demographic questions.

Incivility. Incivility was measured using the 44-item Nursing Incivility Scale (Guidroz et al., 2010). This scale assesses incivility from multiple sources: Nurses, patients, supervisors, physicians, and general incivility. Example items include "Patients are condescending to me," and "My supervisor takes his/her feelings out on me." A five-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) was used.

Sleep quality and quantity. Sleep quality and quantity were assessed using items from the Pittsburgh Sleep Quality Index (PQSI; Buysse et al., 1988). This scale assesses both sleep quality and quantity over the course of the previous 30 days, and all items were included except the final item, which asked for secondary ratings from a bed partner. Sample items include "during the past month, how would your rate your sleep quality overall?" and "during the past

month, how many hours of *actual sleep* did you get each night?" Response scales varied; please see appendix A for a full list of items.

Physical health symptoms. Physical health was measured with the 13-item Physical Symptoms Inventory (Spector & Jex, 1997). Items were assessed over a one-month time frame and included having "an upset stomach or nausea," "indigestion," and "tiredness and fatigue." A five-point frequency response scale from 1 (*not at all*) to 5 (*every day*) was used.

Rumination. Rumination was measured using three items (items 1, 2, and 4) from the Irritation Scale (Mohr, Müller, Rigotti, Aycan & Tschan, 2006). Items asked about responses to mistreatment that the participant experienced that day. An example item is "Even at home I often think of my problems at work." A seven-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) will be used.

Hostile attribution bias. Hostile attribution bias tendencies were assessed using the Hostile Attributional Style Short Form (Bal & O'Brien, 2010). Items asked about responses to social interactions at work. An example is "When coworkers leave me out of social events, it is to hurt my feelings." A six-point Likert-type scale ranging from 1 (*disagree very much*) to 6 (*agree very much*)

RESULTS

In soliciting study respondents, 40,000 emails were sent to potential participants from the Ohio Board of Nursing mailing list. 1,867 emails were bounced back, leaving a total of 38,133 possible respondents. Given the response total of 456 valid responses, this study had a low response rate of about 1 percent. Despite the response rate, the demographics of the survey respondents were largely similar to the state of Ohio's reported demographics for nurses (Ohio Board of Nursing, 2014). Demographics showed that study participants were 91% female and, no average, 47 years old. Sixty percent were married, and participants had an average of 1 child under 19 living in their household (SD = 1.01). Demographic comparisons are shown in Table 1.

Scale descriptives and zero-order correlations for all the variables are shown in Tables 2 and 3. Based on the descriptive statistics included in Table 2, the observed scale ranges were all close to their possible ranges. Moreover, most reliability estimates were over .8 and no estimates were lower than .7, as suggested as a cut point (Nunnally, Berstein, & Berge, 1967). Analyses were conducted using SPSS with data from 456 participants. Analyses were run on mean-centered variables that had data missing completely at random.

Gender, age, and negative affect were used as control variables: gender and age were controlled for based on common practice within previous incivility research (e.g., Cortina et al., 2001), and negative affect was controlled for because of its close relationship with several of the variables of interest, including hostile attribution bias ($r(454) = .32$, $p < .001$), rumination ($r(454) = .51$, $p < .001$), and physical symptoms ($r(454) = .5$, $p < .001$) (e.g., Penney & Spector, 2005). All study variables correlated significantly at the $p < .001$ level; notably, there were strong relationships between poor sleep quality and both sleep quantity and physical health. Poor sleep quality and sleep quantity were strongly correlated, $r(454) = -.5$, $p < .001$, as were poor sleep

quality and physical health, $r(454) = .5$, $p < .001$. Another strong relationship was found between rumination and physical health, $r(454) = .45$, $p < .001$. Overall incivility was moderately related to the three outcome variables of interest at $r(454) = .22$, $p < .001$ for poor sleep quality, $r(454) = -.20$, $p < .001$ for sleep quantity, and $r(454) = .27$, $p < .001$ for physical health. All of the incivility subscales were also moderately related to the three outcome variables, with doctor and coworker incivility equally related most strongly to physical health $r(454) = .30$, $p < .001$.

Hypothesis Testing

Relationship between overall incivility and physical health. According to Hypothesis 1, levels of perceived incivility will be positively related to physical symptoms. Controlling for trait negative affectivity, age, and gender, a significant main effect was found for incivility on physical health symptoms, such that greater amounts of experienced incivility were related to increased physical health symptoms ($\beta = .133$, $t(384) = 2.99$, $p < .01$). Therefore, Hypothesis 1 was supported. This result also satisfies the second condition of Baron and Kenny's (1986) four-step mediation test for Hypothesis 3.

Sleep as a mediating mechanism between incivility and physical health. Hypothesis 3 predicted that sleep quality and quantity would mediate the relationship between perceived incivility and health outcomes. Specifically, it was expected that the relationship between incivility and physical symptoms would decrease substantially when sleep quality and quantity were controlled. Mediation was tested first with the Baron and Kenney method of mediation, in which four steps of analysis are conducted to detect mediation (Baron & Kenney, 1986). Using regression, the steps involve first showing that the causal variable is correlated with the outcome; second, showing that the causal variable is correlated with the mediator; and third, showing that the mediator affects the outcome variable. After these three tests, the final test involves showing

that the relationship between the predictor and the outcome becomes zero when the mediator is controlled for.

A significant main effect was found for incivility on sleep quality and sleep quantity, such that greater experienced incivility was related to lower sleep quality ($\beta = 0.18$ $t(383) = 3.59$, $p < .00$) and quantity ($\beta = -.202$ $t(376) = -3.89$, $p < .00$). This result satisfies the first condition of Baron and Kenny's (1986) mediation test and provides support for Hypothesis 2. Support for Hypothesis 1 satisfies the second condition of the mediation test. Moreover, a significant main effect was found for the effects of sleep quality and quantity on physical health symptoms, such that increased physical health symptoms were related to lower sleep quality ($\beta = .354$ $t(381) = 8.64$, $p < .00$) and quantity ($\beta = -.250$ $t(374) = -5.92$, $p < .00$); therefore, the third condition was also satisfied. Finally, when both overall incivility and sleep quality or quantity were entered into the equation, overall incivility no longer predicted physical symptoms. Both tests demonstrated that the relationship decreased substantially, shifting from significant to non-significant, when sleep quality or quantity was included as a mediator (from $\beta = 0.133$, $t(381) = 2.96$, $p < .01$ to $\beta = .071$, $t(380) = 1.678$, $p = .094$ for sleep quality; from $\beta = 0.127$, $t(374) = 2.82$, $p < .01$ to $\beta = .081$, $t(373) = 1.826$, $p = .069$ for sleep quantity).

To further test the mediation hypotheses, bootstrapping techniques were followed as a secondary analytical approach to directly test the indirect effect between the predictor and outcome variables (Efron & Tibshirani, 1993; Mooney & Duval, 1993), which could address some weaknesses associated with the Sobel test (Preacher & Hayes, 2004; Shrout & Bolger, 2002). The magnitudes of the indirect effects were assessed through bootstrapping (N=1000). Bias-corrected 95% confidence intervals were estimated for each indirect effect.

Results from the bootstrapping procedure indicated that both sleep quality and sleep quantity mediated the relationship between overall incivility and physical symptoms. The overall standardized indirect effect as well as the individual direct effects from both sleep quality and quantity were significant (overall M = .074, p = .001; quality M = .053, p < .005; quantity M = .021, p < .05). Because the 95% bias-corrected bootstrapped confidence intervals for both sleep quality and quantity did not include zero, there is further support for Hypothesis 3 (Quality CI = .017 to .083; Quantity CI = .001 to .039).

Moderating mechanisms between incivility and physical health. Six moderation tests were run to assess whether high levels of hostile attribution bias or rumination would intensify relations between overall incivility and sleep quality or quantity, or incivility and physical symptoms. Results indicated that there were no significant interactions between overall incivility and hostile attribution bias or rumination, offering no support for Hypothesis 4 through Hypothesis 7. See Table 4 and 5 for a summary of the moderator tests.

Research question. In order to address the research question asking about how the source of incivility (physician, supervisor, peer, or patient) affects its relationship with sleep and health outcomes, main effect tests were run between source-specific incivility and sleep quality, quantity, and physical health outcomes. Each source of incivility was significantly related to at least one outcome, and only three tests were non-significant. All four sources were significantly related to physical symptoms, although physical symptoms was the only significant relationship associated with physician-specific incivility (β = 0.152, $t(384) = 3.37$, p < .01). Only two sources were significantly related to sleep quantity, supervisor-specific (β = -.121, $t(374) = -2.21$, p < .05) and peer-specific incivility (β = -.221, $t(376) = -4.24$, p < .01). All sources except physician-specific incivility were significantly related to sleep quality. See Tables 6 through 9 for an

outline of the results for each source of incivility (physician, supervisor, peer, and patient) regressed onto the outcome variables.

Post-hoc analyses. Due to the lack of support for the moderation hypotheses involving overall incivility, post-hoc tests were conducted using the source-specific incivility scales. Analyses revealed that there were no significant interactions between source-specific incivility and rumination or hostile attribution bias to predict sleep. Moreover, source-specific incivility did not interact with hostile attribution bias to predict physical health outcomes. However, results did indicate two significant interactions involving source-specific incivility and rumination on physical symptoms. Both doctor- and patient-related incivility had significant interactions with rumination on physical symptoms (doctor-related: $\beta = 0.10$, $t(380) = 2.43$, $p = .015$, $\Delta R^2 = .01$; patient-related: $\beta = 0.10$, $t(382) = 2.34$, $p = .017$, $\Delta R^2 = .01$). See Figures 2 and 3 for a visual depiction of these interactions as suggested by Aiken and West (1991). These findings might suggest that work-related rumination moderates the relationship between doctor- and patient-related incivility and physical health outcomes such that greater levels of rumination strengthen the negative relationship between incivility and health outcomes. However, the small variance accounted for by these findings is possibly due to chance, given the small difference between slopes in both interaction graphs.

DISCUSSION

Summary of Findings

The current study investigated the relationships among incivility, physical symptoms, sleep, and the individual difference variables of rumination and hostile attribution bias. Based on previous research (Bayne & Jex, 2015), I proposed that incivility would be positively related physical symptoms via the mediating effects of sleep quality and quantity. Study results supported this hypothesized mediating relationship: the current study found full mediation of sleep quality and quantity between incivility and physical health.

I additionally proposed that rumination and hostile attribution bias would serve as moderating mechanisms within the aforementioned mediated relationship between incivility, sleep, and health outcomes. More specifically, I hypothesized that greater levels of work-related rumination or hostile attribution bias would strengthen the negative relationship between both incivility and sleep quality/quantity and the incivility and physical health outcomes. Study results failed to provide support for these moderating relationships: none of the hypothesized relationships were found to be significant. Within a previously conducted pilot study (Bayne & Jex, 2015), rumination was found to moderate the relationship between incivility and sleep outcomes, and hostile attribution bias was found to moderate the relationship between incivility and physical health outcomes. However, these findings were not replicated within the current study. One possible explanation for this is that there was insufficient variance in the criterion to detect to detect a significant relationship. Statistical power can be decreased when there is not enough variance in the criterion variable (Aguinis, 1995), and in the current study, both hostile attribution bias and physical symptoms had lowered variability and means (HAB SD = .73, M =

1.87; Physical Symptoms SD = .57, M = 1.97). Consequently, the current study's statistical power to detect a significant interaction may have been lowered.

Another possible explanation for this mixed finding is that the specific population within which I examined these moderators has adapted to incivility. Within the previously conducted pilot study (Bayne & Jex, 2015), which had a heterogeneous sample representing many different job types, rumination and hostile attribution bias were found to be significant moderators. The findings of the main study did not replicate the pilot study. A possible explanatory difference between the pilot and main study is that its possible that low-level disrespect is so commonplace within the nursing occupation that nurses may have adapted to the occurrence, such that individual differences like rumination or hostile attribution bias do not have a significant effect on outcomes related to negative incidents. Adaptation at work has been found to significantly negatively predict workplace incivility instigation (Reio & Ghosh, 2009), and research has shown that working adults do adapt and recover from uncivil experiences over time (Matthews & Ritter, 2014). Because adaptation can affect individual perceptions of incivility, while nurses may still perceive an event as uncivil, if they have adapted to mild discourteous behaviors in the workplace they may not ruminate about the event or process the event through a negative attributional lens. Because the main study still found significant main effects between incivility, sleep, and physical health outcomes, the idea of adaptation to negative interpersonal interactions within the nursing profession requires future study. Moreover, the current study provided minor support that work-related rumination moderates the relationship between both doctor- and patient-related incivility and physical health outcomes. However, the small variance accounted for by these findings was possibly due to chance, given the small difference between slopes in

both interaction graphs. Future research could provide a secondary test of work-related rumination as a moderator within the relationships between incivility, sleep, and physical health.

It may also be the case that rumination needs to be measured consistently as a state or a trait. The rumination literature has conceptualized the variable as both a state and trait (e.g., Shapiro, 2013; Åkerstedt, et al., 2002). In the current study, the rumination scale asked about tendency to ruminate about work outside of work, which could also be conceptualized as both a state and trait. Future research should examine whether work-related rumination is best measured as a state or trait.

I additionally explored a research question about the differential relationships between source-specific incivility and the proposed outcomes of sleep and physical health outcomes. Notably, all four sources were significantly related to physical symptoms. All sources except physician-specific incivility were significantly related to sleep quality, and only two sources, supervisor- and peer-specific incivility were significantly related to sleep quantity. These findings suggest that incivility from all sources is important to consider while studying outcomes within a nursing population.

Theoretical Implications

The results from the current study extend the existing incivility literature in several ways. First, the resource-based stress model of conservation of resources (COR) theory (Hobfoll, 1989) focuses on the extent to which people are able to maintain resources and use them as tools to achieve desirable states. COR theory implies that loss or threatened loss of resources results in lowered ability to cope as well as psychological distress and that replenished resources will increase coping ability and lower stress (Hobfoll, 1989). Consistent sleep has been suggested as an effective buffer against health effects by its relationship with increased regulatory strength

(Barber et al., 2010), and the current study extends this finding by demonstrating sleep as a full mediator of the relationship between perceptions of incivility and physical health outcomes.

Second, the current study answers a call to incorporate sleep into stress research: the National Institutes of Health have called for greater exploration of the associations between job-related stressors and sleep quality (Knudsen, Ducharme & Roman, 2007), and the current study provided a direct test of the relationships between incivility, sleep quality and quantity, and physical health outcomes. These variables of interest were understudied variables within the nomological network of incivility that have important practical implications for the understanding of incivility and potential workplace interventions. Findings from the current study also suggest that it is important to study source-specific incivility to gain a better understanding of mistreatment within a specific target population.

Practical Implications

Workplace incivility is a commonplace occurrence in the workplace (Andersson & Pearson, 1999; Pearson et al., 2001), and research suggests that organizations are suffering costly productivity loss (Penney & Spector, 2005; Estes & Wang, 2008) as well as turnover (Lim et al., 2008) due to incivility. Incivility within health care settings in particular is a salient research area due to its higher prevalence, with estimates of incivility within hospitals as high as 9 out of 10 nurses reporting experiencing verbal abuse at work (Winstanley & Whittington, 2002). More specifically, nurse perceptions of supervisor incivility have been directly related to turnover intentions (Spence-Laschinger, Leiter, Day & Gilin, 2009), as well as perceptions of poor working relations between nurses and physicians (Rosenstein and O'Daniel 2002, 2005).

Incivility is notoriously difficult to control in the workplace because of its low intensity and because targets of incivility do not often make formal complaints. Incivility is also a

somewhat inevitable aspect of the work environment, because people in many organizations will work with other employees who differ in their values, personalities, and standards for acceptable social interactions (e.g., Zemke, Raines, & Filipczak, 2000). However, a body of incivility research suggests organizations can craft interventions with the goal of reducing instances of incivility (e.g., Leiter, Day, Oore, & Spence Laschinger, 2012) and thusly the negative outcomes associated with those instances. Because the current study adds to this body of research in delineating that each source of incivility for nurses is related to physical health outcomes, civility interventions could additionally help mitigate physical health outcomes along with the myriad other negative outcomes associated with incivility.

There are several ways in which organizations could influence the incidence and impact of incivility. First, incivilous incidents are sometimes attributed to miscommunication on the part of the instigator or the victim. Instigators may not always convey their intent accurately, just as victims may not perceive instigator's messages accurately (Keysar & Henly, 2002; Brone, 2008). Future interventions could stress the importance of concise, accurate and respectful communications between employees. Specifically within the nursing profession, interventions could stress the quality of relationships between nurses and other important hospital positions, such as supervisors and doctors. A positive nurse-physician relationship is related to positive patient outcomes, and the effectiveness of this relationship is also known to increase nursing job satisfaction and to decrease turnover intentions (Captiulo, 2009; Gacki-Smith, Juarez & Boyett, 2009). Hospital-setting civility interventions should focus on all sources of incivility, and supervisors should stress the necessity of positive, clear communication between nurses and doctors (Felblinger, 2008). Recent research on civility interventions has shown that when conducted properly, interventions can result in a civility spiral that continues after the completion

of the intervention, opposite of the incivility spiral proposed by Andersson and Pearson in 1999 (Leiter et al., 2012). The successful intervention tested in Leiter et al.'s study had goals of increasing civility, improving job attitudes and decreasing incivility, distress, and absences.

Second, in line with the common civility intervention goal of decreasing distress and absences, civility interventions should incorporate information about the buffering effects of sleep on the effects of strain at work. The finding in the current study that both sleep quality and quantity fully mediate the relationship between incivility and physical health outcomes suggests that sleep is a necessity for positive functioning in the workplace. These findings are in addition to previous research with self-regulatory theory that has found sleep to be an effective strain intervention that can buffer the negative effects of work stressors (Barber et al., 2010). In addition to the potential decreases in incivility-related physical health outcomes, recent work from Budnick & Barber (2015) suggests that sleep hygiene interventions can have a number of positive effects for organizations, including productivity increases and deviance decreases. The authors note that simply understanding that effective sleep hygiene practices can improve sleep (e.g., Brown, Buboltz, & Soper, 2002), and that sleep hygiene interventions (e.g., a presentation with handouts) is low cost, but high return option for organizations (Budnick & Barber, 2015).

Third, based on the findings from the main study, hospitals and policy-makers should focus on amending policies and developing new policies in order to create an environment in which nurses can address incidences of workplace incivility in a direct and professional manner. In addition to presenting nurses with interventions and policy updates, it would be helpful to additionally educate nurse leaders, supervisors, and doctors themselves about the incidence and outcomes of workplace incivility. Identifying successful interventions to decrease the likelihood of incivility and promote strategies to help nurses to cope with incivility will positively impact a

number of important outcomes including nurse job satisfaction and physical health, as well as patient outcomes. Such interventions and strategies could in turn prove helpful for the recruitment and retention of nurses, and, ultimately, the quality patient care delivered by nurses.

Limitations and Future Research

The current study had several limitations that may have affected its results. First, the study used self-report measures. As always, the use of self-reports raises potential concerns about common method bias (Podsakoff et al., 2003). Measures were taken in an attempt to reduce any common method variance by controlling for negative affect and including instructions that stressed the anonymity of participants' responses. Secondly, study participants consisted mainly of females (91%) and Caucasians (93%), which raises concerns about generalizability of the findings of the study (Brewer, 2000). However, as shown in Table 1, these demographics are fairly similar to the demographics of nurses across the state of Ohio. On a related note, the current study had a very low response rate of less than 1%, raising the issue of representativeness of the sample from non-respondents. However, a meta-analysis by Schalm and Kelloway (2001) found correlations between effect sizes and response rates are small within occupational health research. Given the similar demographics of the respondents and Ohio nurses, as well as the findings of the meta-analyses, the sample characteristics of the study are not problematic enough to discount the findings of the present study. A third limitation is that the current study utilized a cross-sectional design, preventing a more in-depth understanding of the relationships between sleep and incivility. While sleep was found to mediate the relationship between perceived incivility and physical health outcomes, sleep deprivation may also lead to greater perceptions of incivility in the first place. Recent research has shown that sleepiness is related to a workplace interpretive bias by which sleep deprivation affects workers' initial

interpretations of workplace events through their cognitive state of sleepiness (Barber & Budnick, 2015). Given this recent cognitive-related research on sleepiness and incivility, future research should address the behavioral and affective outcomes of this relationship in a longitudinal manner.

There are a number future research directions suggested by the current study. First, it is important to further examine how sleep quality and quantity are related to incivility and its outcomes at the daily level. Longitudinal examination of these variables will help to clarify the causal relationship that sleep has with organizational variables. Within the line of research related to nursing specifically, it is important to study additional work shifts in the future. The current study was restricted to day shift nurses in order to limit any confounding variables that studying a night or swing shift could add. In these different shifts, sleep deprivation is often already a problem. Given the findings of the current study, it is reasonable to suggest that future studies involving night shift and swing shift nurses may see amplification in these effects.

Another future direction would be to examine how different occupations, including nursing, adapt to incivility. As previously discussed, adaptation at work has been found to significantly negatively predict workplace incivility instigation (e.g., Matthews & Ritter, 2014; Reio & Ghosh, 2009). Future research should examine whether adaptation also affects individual perceptions of incivility, and whether adaptation makes a significant difference in job specific (e.g., call centers, nursing, and service jobs) vs. heterogeneous samples. One potential way to examine adaptation would be to examine whether there is a differential relationship, based on tenure, between perceived incivility, sleep, physical health outcomes and individual difference variables.

A third future research direction involves examining the items used to measure incivility. Current measures of incivility have a great deal of overlap, both conceptually and at the item level, with other measures of workplace mistreatment (Hershcovis, 2011; Jex & Bayne, in press). Moreover, while incivility is characterized by its ambiguous qualities, many items measuring incivility are not ambiguous in nature (e.g., "physicians shout or yell at me for making mistakes," from the Nursing Incivility Scale; Guidroz et al., 2010). Given that the theoretical relationship between hostile attribution bias and incivility is predicated on the ambiguous nature of uncivil interactions, future research could assess whether attributional biases are truly related to the interpretation of incivility. This could be examined by selecting and measuring incivility using scale items that are specifically ambiguous in nature.

Conclusion

Workplace incivility is supported by an ever-growing body of research suggesting that despite its low-level qualities, the construct can have serious and long-term effects on important organizational and individual outcomes (Cortina et al., 2001, Pearson & Porath, 2009). Results from the current study suggest that one of these outcomes – physical health – is a direct effect of incivility that is mediated by sleep quality and quantity. Future research should continue to examine these relationships within homogenous populations, and additionally focus on studying the effects of sleep on organizational variables within a longitudinal design, such as a daily diary study. Better understanding of variables affecting the incidence and impact of incivility will help researchers and policymakers design more effective interventions to reduce incivility in the workplace and improve organizational and individual outcomes.

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Table 1. *A Comparison of the Study Sample's Demographics with the Ohio Nursing Population Pool*

	Current Study's Sample ($N = 456$)	**Ohio Nursing Population Pool** ($N = 49{,}641$)
Gender		
Female	91%	92%
Male	9%	8%
Age (Mean)	47 years old	47 years old
Racial Background:		
Caucasian	93%	90%
African American	4%	5%
Other	3%	5%

Table 2. *Descriptive Statistics and Internal Consistencies*

Variable	Mean	SD	Observed Range	Possible Range	Alpha
Sleep Quality	2.29	.92	1-5	1-5	-
Sleep Quantity	6.32	1.07	6.5	0-24	-
Incivility					
Overall	2.83	.77	1 – 5	1 – 5	.87
Nurses	2.66	.85	1 – 5	1 – 5	.92
Supervisors	1.89	.97	1 – 5	1 – 5	.93
Doctors	2.69	1.02	1 – 5	1 – 5	.91
Patients	2.52	.90	1 – 5	1 – 5	.93
Physical Symptoms	1.97	.57	1 – 4.08	1 – 5	.82
Hostile Attribution Bias	1.87	.73	1 – 4.43	1 – 6	.77
Rumination	3.96	1.78	1 – 7	1 – 7	.86
Negative Affectivity	1.91	.62	1 – 4.3	1 – 5	.86

Note. $N = 456$

Table 3. *Intercorrelations among Variables*

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Poor Sleep Quality	-										
2. Sleep Quantity	-.50	-									
3. Physical Health	.50	-.35	-								
4. Hostile Attribution Bias	.21	-.13	.26	-							
5. Rumination	.37	-.18	.45	.33	-						
6. Overall Incivility	.22	-.20	.27	.47	.18	-					
7. Nurse Incivility	.28	-.24	.30	.46	.24	.64	-				
8. Supervisor Incivility	.20	-.16	.26	.37	.23	.38	.47	-			
9. Doctor Incivility	.18	-.13	.30	.36	.29	.38	.41	.34	-		
10. Patient Incivility	.18	-.15	.27	.31	.17	.35	.33	.28	.38	-	
11. Negative Affect	.26	-.16	.50	.32	.51	.27	.29	.34	.33	.32	-

Note. Absolute values of .13 or above are significant at $p < .01$ (2-tailed). $N = 454$.

Table 4. *Results of Moderated Regression Analyses for Overall Incivility and Rumination on Sleep Quality, Sleep Quantity, and Physical Symptoms*

	Sleep Quality			Sleep Quantity			Physical Symptoms		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Variable	B	B	B	B	B	B	B	B	B
Age	.001	.00	.00	-.002	-.001	-.001	.001	.001	.001
Gender	.20	.15	.15	-.15	-.15	-.15	.31**	.27**	.27**
NA	.35**	.09	.08	-.26**	-.12	-.13	.31**	.31**	.31**
Incivility		.19**	.19**		-.28**	-.27**		.09**	.09**
Rumination		.13**	.13**		-.03	-.03		.08**	.08**
Incivility * Rumination			.02			.03			.005
ΔR^2	.06**	.08**	.00	.02*	.04**	.00	.28**	.06**	.00
Cumulative R^2	.06	.14	.14	.02	.06	.06	.28	.35	.35

Note. Regression weights are unstandardized. $N = 454$. *$p < .05$, **$p < .01$.

Table 5. *Results of Moderated Regression Analyses for Overall Incivility and Hostile Attribution Bias on Sleep Quality, Sleep Quantity, and Physical Symptoms*

	Sleep Quality			Sleep Quantity			Physical Symptoms		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Variable	B	B	B	B	B	B	B	B	B
Age	.001	.001	.001	-.002	-.001	-.001	.001	.001	.001
Gender	.20	.24	.24	-.16	-.18	-.18	.31**	.33**	.33**
NA	.35**	.24**	.24**	-.26**	-.16	-.16	.47**	.42**	.42**
Incivility		.17**	.16*		-.27**	-.27**		.08*	.08*
Hostile Attribution Bias		.12	.15*		-.03	-.03		.06	.07
Incivility * HAB			-.12			.02			-.02
ΔR^2	.06**	.04**	.01	.03*	.04**	.00	.28**	.02**	.00
Cumulative R^2	.06	.1	.11	.03	.07	.07	.28	.31	.31

Note. $N = 454$. Regression weights are unstandardized. *$p < .05$, **$p < .01$.

Table 6. *Results of Regression Analyses for Physician-Specific Incivility on Sleep Quality, Sleep Quantity, and Physical Symptoms*

	Sleep Quality		Sleep Quantity		Physical Symptoms	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Variable	B	B	B	B	B	B
Age	.001	.001	-.002	-.002	.001	.001
Gender	.20	.21	-.15	-.16	.31**	.32**
NA	.35**	.30**	-.26**	-.22*	.46**	.42**
Physician Incivility		.09		-.07		.08**
ΔR^2	.06**	.01	.024*	.004	.28**	.02**
Cumulative R^2	.06	.07	.024	.028	.28	.30

Note. $N = 454$. Regression weights are unstandardized. *$p < .05$, **$p < .01$.

Table 7. *Results of Regression Analyses for Supervisor-Specific Incivility on Sleep Quality, Sleep Quantity, and Physical Symptoms*

	Sleep Quality		Sleep Quantity		Physical Symptoms	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Variable	B	B	B	B	B	B
Age	.001	.00	-.002	-.001	.001	.001
Gender	.22	.19	-.19	-.15	.30**	.29**
NA	.34**	.26**	-.24**	-.16	.46**	.43**
Supervisor Incivility		.13**		-.13*		.07*
ΔR^2	.06**	.02**	.02*	.01*	.28**	.01*
Cumulative R^2	.06	.08	.02	.03	.28	.29

Note. $N = 454$. Regression weights are unstandardized. *$p < .05$, **$p < .01$.

Table 8. *Results of Regression Analyses for Peer-Specific Incivility on Sleep Quality, Sleep Quantity, and Physical Symptoms*

	Sleep Quality		Sleep Quantity		Physical Symptoms	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Variable	B	B	B	B	B	B
Age	.001	.001	-.002	-.002	.001	.001
Gender	.20	.21	-.151	-.14	.31**	.31**
NA	.35**	.26**	-.26*	-.14	.46**	.42**
Peer Incivility		.23**		-.28**		.10**
ΔR^2	.06**	.04**	.02*	.05**	.28**	.02**
Cumulative R^2	.06	.10	.02	.07	.28	.30

Note. $N = 454$. Regression weights are unstandardized. *$p < .05$, **$p < .01$.

Table 9. *Results of Regression Analyses for Patient-Specific Incivility on Sleep Quality, Sleep Quantity, and Physical Symptoms*

	Sleep Quality		Sleep Quantity		Physical Symptoms	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Variable	B	B	B	B	B	B
Age	.001	.001	-.002	-.002	.001	.001
Gender	.20	.21	-.16	-.16	.31**	.32**
NA	.35**	.31**	-.25**	-.20*	.46**	.43**
Patient Incivility		.11*		-.12		.08**
ΔR^2	.06**	.10*	.02*	.01	.28**	.02**
Cumulative R^2	.06	.07	.02	.03	.28	.30

Note. $N = 454$. Regression weights are unstandardized. *$p < .05$, **$p < .01$.

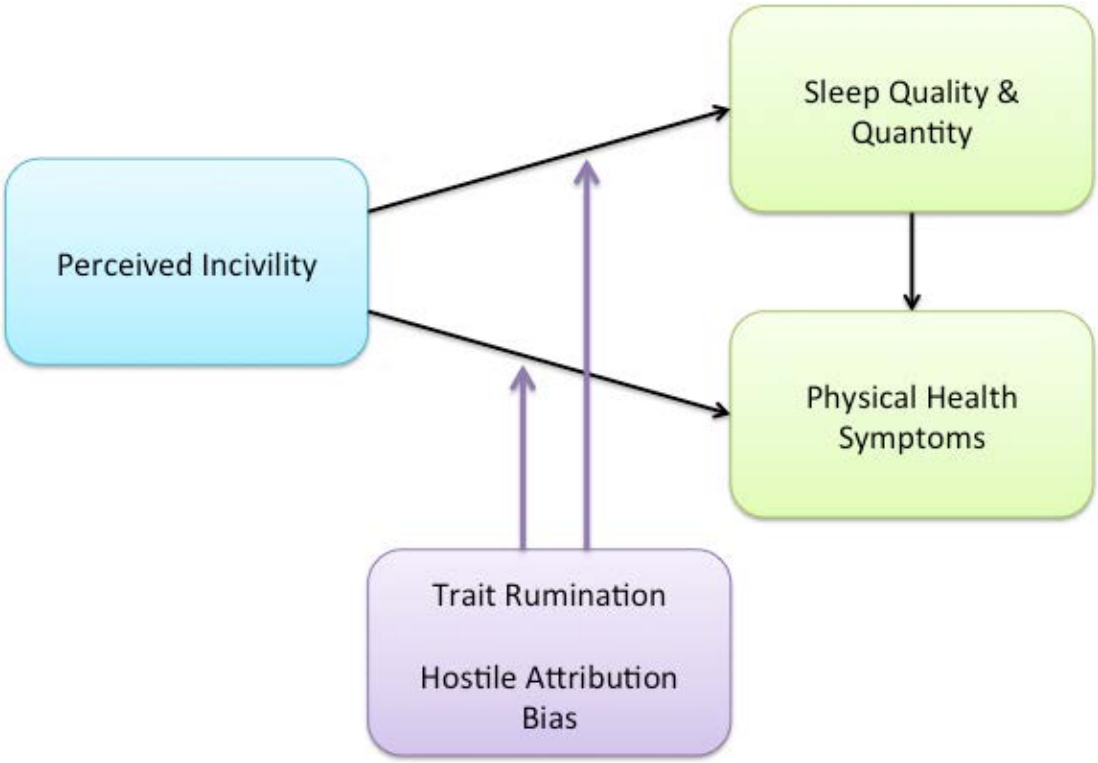

Figure 1: Proposed Relationships

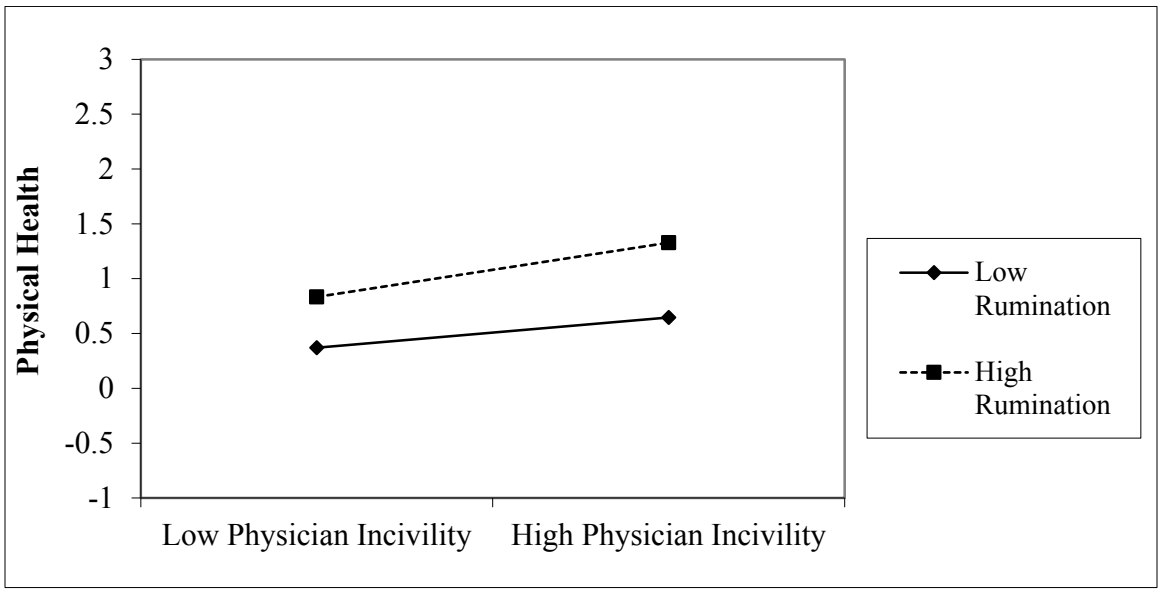

Figure 2. A plot showing interaction effects of physician-specific incivility and rumination on physical health outcomes.

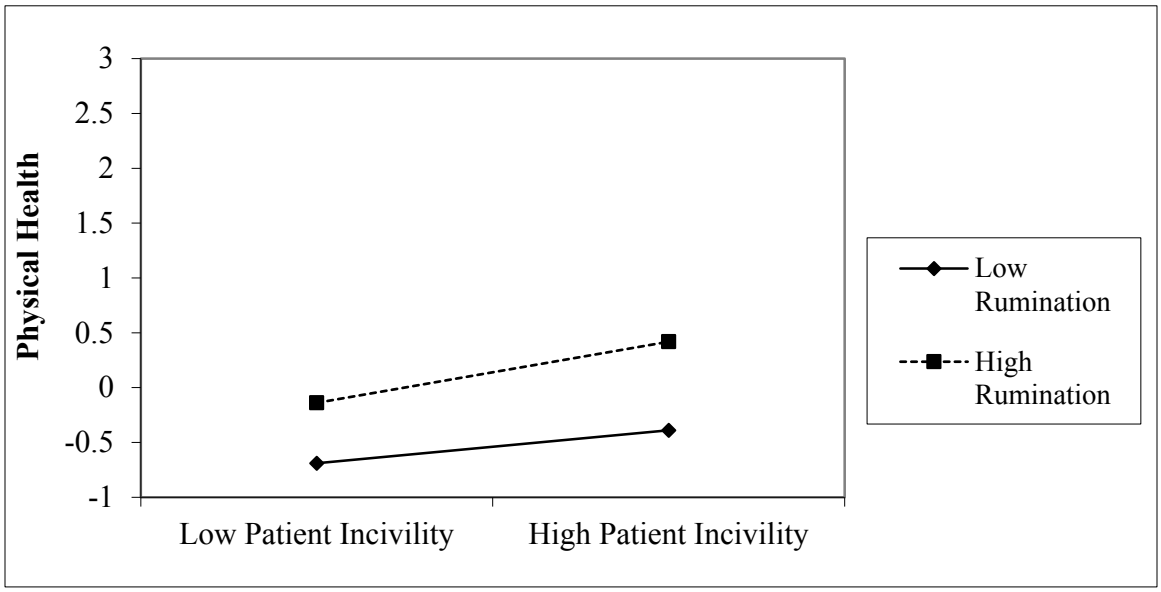

Figure 3. A plot showing the interaction effects of patient-specific incivility and rumination on physical health outcomes.

APPENDIX A: MEASURES

Nursing Incivility Scale (44 Items):

Participant Instructions: Please tell us about the type of interactions you have with the people you meet at work. The following statements describe behaviors that sometimes occur in the workplace. Please indicate your level of agreement with each of the following statements using one number that best represents your present work situation.

1 = Strongly Disagree 2 = Disagree 3 = Neither Agree nor Disagree
4 = Disagree 5 = Strongly Agree

For the following items, please consider **all individuals** you interact with at work, including doctors and other nurses or hospital personnel.

---

1 HC Hospital employees raise their voices when they get frustrated.
2 HC People blame others for their mistakes or offenses.
3 HC Basic disagreements turn into personal verbal attacks on other employees.
4 IJ People make jokes about minority groups.
5 IJ People make jokes about religious groups.
6 IJ Employees make inappropriate remarks about one's race or gender.
7 IB Some people take things without asking.
8 IB Employees don't stick to an appropriate noise level (e.g., talking too loudly).
9 IB Employees display offensive body language (e.g., crossed arms, body posture).

The following describe your interactions with other **nurses**. Other nurses on my unit . . .

1 HC ...argue with each other frequently.
2 HC ...have violent outbursts or heated arguments in the workplace.
3 HC ...scream at other employees.
4 GR ...gossip about one another.
5 GR ...gossip about their supervisor at work.
6 GR ...bad-mouth others in the workplace.
7 GR ...spread bad rumors around here.
8 FR ...make little contribution to a project but expect to receive credit for working on it.
9 FR ...claim credit for my work.
10 FR ...take credit for work they did not do.

Please think about your interactions with your **direct supervisor** (i.e., the person you report to most frequently) and indicate how strongly you agree with the following statements.

My direct supervisor . . .

1 AS ...is verbally abusive.
2 AS ...yells at me about matters that are not important.

3 AS ...shouts or yells at me for making mistakes.
4 AS ...takes his/her feelings out on me (e.g., stress, anger, blowing off steam).
5 LR ...does not respond to my concerns in a timely manner.
6 LR ...is condescending to me.
7 LR ...factors gossip and personal information into personnel decisions.

This section refers to **physicians** you work with. Please indicate your level of agreement with the following items.

1 AS Some physicians are verbally abusive.
2 AS Physicians yell at nurses about matters that are not important.
3 AS Physicians shout or yell at me for making mistakes.
4 AS Physicians take their feelings out on me (e.g., stress, anger, blowing off steam).
5 LR Physicians do not respond to my concerns in a timely manner.
6 LR I am treated as though my time is not important.
7 LR Physicians are condescending to me.

Please reflect upon your interactions with the **patients** you care for and their **family and visitors** and indicate the extent to which you agree with the following statements. Patients/visitors . . .

1 LR ... do not trust the information I give them and ask to speak with someone of higher authority.
2 LR ... are condescending to me.
3 LR ... make comments that question the competence of nurses.
4 LR ... criticize my job performance.
5 LR ... make personal verbal attacks against me.
6 LR ... pose unreasonable demands.
7 DF ... have taken out their frustrations on nurses.
8 DF ... make insulting comments to nurses.
9 DF ... treat nurses as if they were inferior or stupid.
10 DF ... show that they are irritated or impatient.

Pittsburgh Sleep Quality Index (10 Items):

Instructions:

The following questions relate to your usual sleep habits during the past month *only*. Your answers should indicate the most accurate reply for the *majority* of days and nights in the past month. Please answer all questions.

1. During the past month, when have you usually gone to bed at night?

   USUAL BED TIME _____

2. During the past month, how long (in minutes) has it usually take you to fall asleep each night?

   NUMBER OF MINUTES _____

3. During the past month, when have you usually gotten up in the morning?

   USUAL GETTING UP TIME _____

4. During the past month, how many hours of *actual sleep* did you get at night? (This may be different than the number of hours you spend in bed.)

   HOURS OF SLEEP PER NIGHT _____

For each of the remaining questions, check the one best response. Please answer *all* questions.

5. During the past month, how often have you had trouble sleeping because you...

   (a) Cannot get to sleep within 30 minutes

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

   (b) Wake up in the middle of the night or early morning

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

   (c) Have to get up to use the bathroom

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

   (d) Cannot breathe comfortably

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

   (e) Cough or snore loudly

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

   (f) Feel too cold

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

   (g) Feel too hot

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

   (h) Had bad dreams

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

   (i) Have pain

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(j) Other reason(s), please describe _____

_____

How often during the past month have you had trouble sleeping because of this?

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____

6. During the past month, how would you rate your sleep quality overall?
   - Very good _____
   - Fairly good _____
   - Fairly bad _____
   - Very bad _____
7. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?
   - No problem at all _____
   - Only a very slight problem _____
   - Somewhat of a problem _____
   - A very big problem _____

Rumination (3 Items):

Items 1, 2 and 4 from the Irritation Scale (Mohr et al., 2006)
Response Scale:
1 = strongly disagree to 7 = strongly agree

1. I have difficulty relaxing after work.
2. Even at home I often think of my problems at work.
4. Even on my vacations I think about my problems at work.

Hostile Attribution Bias (7 Items):

Bal, A., & O'Brien, K. E. (2010). *Validation of the Hostile Attributional Style Short Form*. Paper presented at the Society for Industrial and Organizational Psychology, Atlanta, GA, April 8-10.

	Disagree very much *Disagree moderately* *Disagree slightly* *Agree slightly* *Agree moderately* *Agree very much*
When coworkers leave me out of social events, it is to hurt my feelings	1 2 3 4 5 6
If coworkers do not appreciate me enough, it is because they are self-centered	1 2 3 4 5 6
If coworkers work slowly on a task I assigned them, it is because they do **not** like me	1 2 3 4 5 6
If people are laughing at work, I think they are laughing at me	1 2 3 4 5 6
If coworkers ignore me, it is because they are being rude	1 2 3 4 5 6
Coworkers deliberately make my job more difficult	1 2 3 4 5 6
When my things are missing, they have probably been stolen	1 2 3 4 5 6

Physical Symptoms (13 Items):
Physical Symptoms Inventory – 13-item Version (Spector & Jex, 1997)

Over the past month, how often have you experienced each of the following symptoms?	**Not at all**	**Once or Twice**	**Once or twice per week**	**Most days**	**Every day**
1. An upset stomach or nausea	1	2	3	4	5
2. A backache	1	2	3	4	5
3. Trouble sleeping	1	2	3	4	5
4 Headache	1	2	3	4	5
5. Acid indigestion or heartburn	1	2	3	4	5
6. Eye strain	1	2	3	4	5
7. Diarrhea	1	2	3	4	5
8. Stomach cramps (Not menstrual)	1	2	3	4	5
9. Constipation	1	2	3	4	5
10. Ringing in the ears	1	2	3	4	5
11. Loss of appetite	1	2	3	4	5
12. Dizziness	1	2	3	4	5
13. Tiredness or fatigue	1	2	3	4	5

Screening Questions (2 items):

1. Employed Full Time
2. Not working the night shift or swing shift

Demographic Questions (10 items):

1. What is your age in years? ___
2. What best describes your Race/Ethnic Group? (Choose all that apply)
   - **Hispanic or Latino.** A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.
   - **American Indian or Alaska Native.** A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
   - **Asian.** A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
   - **Black or African American.** A person having origins in any of the black racial groups of Africa.
   - **Native Hawaiian or Other Pacific Islander.** A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
   - **White.** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
   - **Other,** please specify: _____
3. What is your marital status? (Choose one): Single (never married), Married/partnered, Divorced, Widowed
4. How many children under the age of 19 live in your home? ____
5. How many dependent adults (for whom you provide direct care) live in your home? ____
6. How many years have you worked as a staff nurse? ____
7. How many hours/week do you work on average? ____
8. What is your current title? _____
9. Which shift do you primarily work? (Choose all that apply): Day-shift, Swing shift, Night shift, Other (specify) _____
10. Are you being treated by a physician for a sleep disorder? (Y/N)

APPENDIX B: CONSENT LETTER

BGSU
Bowling Green State University

Department of Psychology
Bowling Green State University
Bowling Green, OH 43403

Informed Consent

The purpose of this study is to improve our understanding of how individuals respond to interpersonal mistreatment in the workplace. Interpersonal mistreatment is any mistreatment that occurs between individuals in the workplace who know each other or work together. This study is being conducted by Alison Bayne, a graduate student in the psychology department at Bowling Green State University.

Understanding how people respond to interpersonal mistreatment will help organizations take steps to ease the negative effects of mistreatment on individuals. In short, while you will not receive any direct benefits for participating in this research, you will be helping to increase our understanding of how people in the workplace interact with each other, which is beneficial to society in general. The risks associated with participating in this study are no greater than those encountered in daily life. You will be asked to complete a short survey consisting of a few short questionnaires. **It should take less than 20 minutes to answer the questions, and you will be able to enter your email address in a separate drawing for one of ten $30 Amazon gift cards**. If you choose to enter the raffle, your name and email address will not be attached to any other information collected from you in the survey.

You must be employed full time as a nurse and **not** primarily working the night shift to participate in this study. Your participation in this study is completely voluntary, and you are free to discontinue participation in this study at any time. Deciding to participate or not will not affect any relationship you may have with Bowling Green State University. You may also freely decline to respond to any questions without loss of credit. Declining to respond to particular questions will not be penalized.

To protect your anonymity, your data will be stored on password-protected laptops of the researchers involved in the project. In addition, your anonymity will be protected through the Qualtrics system, which does not allow us to contact you directly. For your security, after you finish making and submitting your choices, please clear your browser history and page cache; in addition, you may want to complete the survey on a personal (non-public) computer.

If you have any questions or comments regarding this study or your participation in it, you may contact the principal investigator, Alison Bayne, at abayne@bgsu.edu or (419) 372-4404, or her advisor, Dr. Steve Jex, at sjex@bgsu.edu or (419) 372-2132. If you have any questions about the conduct of this study or your rights as a research participant, you may contact the Chair of Bowling Green State University's Human Subjects Review Board at (419) 372-7716, or hsrb@bgsu.edu.

By clicking "next," you are consenting to participate in this study.