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Effects of Occupational Stressors on Nurses' Safety Performance and Well-being: A Within-Individual Study

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Effects of Occupational Stressors on Nurses' Safety Performance and Well-being:

A Within-Individual Study

by

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DEDICATION

I want to dedicate my dissertation to my family who supported through the years while I was in graduate school. I am lucky to have them in my life and I will be forever grateful for being in their life.

I also want to dedicate this piece to Qiaoniu who has been there with me through the most difficult stage of this dissertation. She was my emotional support and kept me together whenever I wanted to give up.

Finally, I want to dedicate my dissertation to my advisor, Dr. Paul Spector, and my friends in graduate school. Without their guidance and help, I could not put this together and achieve many things in these years.

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ABSTRACT

Occupational stressors have been extensively studied as predictors of safety performance and employee well-being in previous research. However, many newly introduced organizational constructs that have the characteristics of an occupational stressor have rarely been studied as such, especially from a within-person perspective. The current study focused on three occupational stressors in relation to safety performance. Based on previous literature, I proposed that within individuals, compulsory citizenship behavior, illegitimate tasks, and interpersonal conflict at work as occupational stressors would have negative effects on employees well-being and safety performance through negative emotions (anger), job attitudes (job satisfaction and organizational commitment) and role stressors (role conflict and role ambiguity). In addition, reception of organizational citizenship behavior (ROCB) and perceived safety climate were hypothesized to moderate the relationships of the three occupational stressors with safety performance and employee well-being. Seventy-one nurses were recruited, and data were collected from their survey responses about their daily experiences on the focal variables for 9 shifts over three consecutive working weeks. Results showed that within individuals, the three occupational stressors were positively associated with employee burnout and physical symptoms, and evidence was found that those associations might be mediated by anger, job satisfaction and role conflict. Further, ROCB was found to moderate some of the associations of occupational stressors with safety performance and employee well-being. However, the current study failed to find support for any of the hypotheses regarding perceived safety performance as a moderator in this sample. Findings, limitations and future directions were discussed.

CHAPTER 1: INTRODUCTION

In 2012 the National Institute for Occupational Safety and Health (NIOSH) reported that approximately 4383 U.S workers died from occupational injuries and roughly another 49,000 workers died from occupational related acute or chronic illness (Traumatic Occupational Injuries, n.d.). In addition, the number of employees who experienced nonfatal occupational injuries or work related illness is approximately 4 million and about half of these workers needed medical treatment. In 2013, the Bureau of Labor Statistics reported that 16 registered nurses died from fatal occupational injuries including interpersonal violence or injuries (4 nurses) and exposure to harmful substance and environments (3 nurses), and approximately 348,700 nonfatal occupational injuries or work related illness happened in the healthcare sector. In addition, according to American Nurses Association, 56% of hospital nurses suffer from a musculoskeletal disorder in 2011. Furthermore, these health and safety incidents not only adversely affected employees, but also negatively impacted organizational productivity and the safety of their clients, customers and patients. Clearly, the social and financial consequences following these incidents are extremely burdensome to organizations where these employees work, as well as to the public. In order to prevent these tragic events from happening and to reduce the cost, scholars have devoted considerable effort to studying factors affecting workplace safety and employee well-being.

It has been pointed out that failures of complying with appropriate safety procedures and/or failures of promoting safety performance are the major reasons for the occurrences of workplace incidents (Nahrgang, Morgeson, & Hofmann, 2011). With this being said, safety

performance is an important aspect of performance that keeps the organization functional and the employees safe. To better understand safety performance, one stream of research recognizes occupational stressors as significant risk factors for poor safety performance (Clarke, 2012). However, searching PsycINFO using both terms combined yielded fewer than 20 relevant articles, indicating a significant lack of empirical research in this field. In contrast, researchers have paid tremendous amount of attention to studying factors that might affect employee health and well-being, mainly focusing on established stressors (Potter, Smith, Strobel, & Zautra, 2002; Spector, Dwyer, & Jex, 1988). There is a need to both link stressors to safety performance, as well as to investigate new stressors that have received limited attention. Thus, this dissertation will focus on three occupational stressors as potential antecedents of employee safety performance and well-being, and the mechanisms underlying these relationships. Included will be several potential mediators and moderators.

Griffin and Neal (2000) summarized previous research on workplace safety and built the framework of safety performance based on the model of job performance proposed by Borman and Motowidlo (1993). The two components in the model of job performance are task performance and contextual performance that Griffin and Neal (2000) applied to characterize safety performance components. By definition, task performance in safety is called safety compliance, reflecting "core safety activities that need to be carried out by individuals to maintain workplace safety" (Griffin & Neal, 2000, p. 349). These activities include compliance with safety procedures and rules, and adherence to daily routines for maintaining a safe environment at work. The contextual performance component of safety performance is called safety participation that represents the "behaviors such as participating in voluntary safety activities or attending safety meetings" (Griffin & Neal, 2000, p. 349). These behaviors are

important for establishing and refining safety policy and rules as well as building and improving safe climate in organizations.

Since the Griffin and Neal (2000) framework was proposed, research on safety performance has been focusing on identifying predictors of safety compliance and participation in order to guide best practices. Commonly studied predictors of safety performance include perceived safety climate, leadership style and behavior (such as transformational leadership and abusive leadership; Inness, Turner, Barling, & Stride, 2010), and job stressors and strains (e.g., job demand and control, burnout; Li, Jiang, Yao, & Li, 2013; Nahrgang et al., 2011). However, as compared to the large number of studies examining predictors of task performance and contextual performance (Dalal, 2005; Riketta, 2008), research on predictors of safety performance is still limited.

Previous research showed that both general occupational stressors and strains are related to safety performance and outcomes (Nahrgang et al., 2011). In a meta-analysis, Nahrgang and colleagues (2011) summarized research on job demands, burnout, engagement, and safety outcomes. They found that job stressors are negatively related to safety outcomes and the relationships are partially mediated by burnout and engagement. However, they studied job demand as the only stressor and included only one aspect of safety performance as safety outcome in their study. Thus, it is unclear whether other occupational stressors can also influence safety performance. In addition, the underlying mechanism through which occupational stressors might influence safety performance is rarely examined. Thus, the current study aimed to remedy these research gaps in the safety performance literature by examining three occupational stressors as potential antecedents of safety performance, including Compulsory Citizenship Behavior (CCB, the extra-role behaviors that are forced upon the employees in order to lower

costs and increase productivity; Vigoda-Gadot, 2006), Illegitimate Tasks (IT, tasks at work that are not aligned with the expectations from a given person, including unnecessary tasks and unreasonable tasks; Semmer, Jacobshagen, Meier & Elfering. 2013) and Interpersonal Conflict at Work (ICAW, the extent to which employees experience arguments with others at work; Spector & Jex, 1998) and exploring the mechanism underlying those relationships by examining potential mediators.

There has been increasing attention to employee health and well-being, and job stressors have been extensively studied as antecedents of employee health and well-being (Nixon, Mazzola, Bauer, Krueger, & Spector, 2011; Spector & Jex, 1998). Although additional stressors needed to be identified, the underlying mechanisms through which occupational stressors affect employee psychological and physical health have been less studied. Thus, the current study will also examine the effects of these three stressors on employee health and well-being, and explore employee negative emotions, job attitudes, and role stressors as potential mediators of the relationships.

It is likely that the relationships between occupational factors and safety performance can be influenced by other organizational factors as previous research showed inconsistent results on the relationship between organizational factors and safety performance (Nahrgang et al., 2011). Organizational factors that provide additional support and resources for employees to cope with work-related demands might result in less sacrifice of safety performance to deal with those demands. One such factor is Reception of Organizational Citizenship Behavior (ROCB) that refers to the process of employees receiving OCB from co-workers and supervisors at work (Che, 2012). It was shown that ROCB was positively related to job performance and employees' well-being, and negatively related to occupational stress and counterproductive work behavior (CWB,

intentional behaviors by organizational members that harm the organizations and/or employees within organizations; Che, 2012; Spector & Fox, 2005). Therefore, ROCB can be considered a type of resource that buffers the negative effects of occupational stressors on employee safety performance and well-being. It is likely that an individual receiving more OCB will have more time and resources to complete safety-related tasks and preserve their own energy, and thus his/her safety performance and well-being are less likely to be influenced by occupational stressors.

Another such organizational factor is perceived safety climate that was mainly studied as a predictor of safety performance in previous research (Jiang, Yu, Li, & Li, 2010). The Jiang et al. (2010) study explored the relationships between perceived colleagues' safety knowledge/behavior and safety compliance/participation. Specially, under high level of group perceived safety climate, employees are encouraged to pay more attention to safety issues as compared to under low perceived safety climate, thus the relationship between safety knowledge/behavior and safety performance is stronger.

Overall, this dissertation contributes to the current literature by examining additional occupational stressors as predictors of safety performance and employee well-being, and investigating the mechanism underlying these relationships. Specially, I intend to test the relationships of three occupational stressors (compulsory citizenship behavior, interpersonal conflict at work, and illegitimate tasks) with the two dimensions of safety performance (safety compliance and safety participation) and two aspects of well-being employee (burnout and physical symptoms). Then I plan to examine the mechanisms of these relationships by exploring negative emotion (anger), job attitude (job satisfaction and organizational commitment), and role stressors (role conflict and role ambiguity) as potential mediators. Moreover, two organizational

factors (reception of organizational citizenship behavior and perceived safety climate) are identified as potential moderators of the relationships of occupational stressors and safety performance with employee well-being, which could be used to explain some of the inconsistent findings regarding job stress and safety performance (Nahrgang et al., 2011). Last, a within individual design used by this dissertation will allow us to study the dynamic changes and variations within individuals.

Literature Review

In this section, I will briefly review current research findings of main constructs in this dissertation, including safety performance, employee health and well-being, compulsory citizenship behavior (CCB), illegitimate tasks (IT), interpersonal conflict at work, reception of organizational citizenship behavior (ROCB), and perceived safety climate. The purpose of this section is to present the current stage of research on these constructs and to develop hypotheses of this dissertation.

Safety Performance

Early research on safety performance was built on the research of workplace incidents. These studies mainly focused on understanding why accidents happened and identifying antecedents of safe and unsafe performance given their important theoretical and practical implications (Hofmann, Jacobs & Landy, 1995). Relevant research can be found in several disciplines. Hofmann and colleagues summarized these studies in safety performance in high reliability process from multiple disciplines (Hofmann, Jacobs & Landy, 1995). They stated that safety performance is determined by both individual factors such as cognitive processes and motivation, micro-organizational factors such as organizational policies and management attitudes, and macro-organizational factors such as work force specification and structure of

communication. The three levels of influence interactively affect organizational safety performance/outcomes. However, there were not many empirical studies back then to support their propositions. Thus, in the end of their review, the authors called for more studies on safety performance considering more social-organizational factors in multiple levels of analysis.

Hofmann and Stetzer (1996) explored both individual and higher level factors as determinants of safety performance of working teams in a chemical processing plant. They demonstrated that role overload as an occupational stressor is positively related to unsafe behavior while group process and safety climate are negatively related to unsafe behavior. Their study was among the earliest ones that investigated safety behaviors on both individual and team levels, and found there is a cross-level effect of the predictors on safety performance. Specifically, their results showed that individual level factors (i.e., perceptions of role overload) can predict safety performance on a group level and group level factors (i.e., group process, safety climate, and intentions to approach other team members engaged in unsafe acts) can also predict individual level safety performance. Another important implication of their study was that the evidence suggested the relationship between organizational factors and safety performance is mediated by other organizational processes.

Building on this evidence, Hofmann and Stetzer (1998) identified safety communication as a mediator of the relationship between safety climate and interpretation of safety performance. In a qualitative study, Kidd, Schat, and Veazie (1996) indicated that the relationship between occupational stressors and safety performance is mediated by decision-making. However, despite the fact that safety performance was a popular topic of research before the new millennium, there was a lack of theoretical models of safety performance in those studies. Because of this limitation, the indicators of safety performance were not comparable across studies and it was

difficult to systematically identify antecedents of safety performance and understand the mechanism of these relationships.

To address this limitation, Griffin and Neal (2000) summarized previous research and proposed a model for safety performance. Their model of safety performance includes two dimensions that resemble task performance and contextual performance in Borman and Motowidlo's (1993) model of job performance, respectively. Because of this resemblance, the distinctions in determinants and antecedents of the two dimensions of job performance should be very much replicable in safety performance. For example, drawn from the framework proposed by Campbell et al. (1993), Griffin and Neal (2000) hypothesized that the effect of safety climate on safety performance is mediated by safety knowledge, safety skill and safety motivation. Their results showed that safety knowledge is a significant mediator for the relationship between safety climate and safety compliance but not for the relationship between safety climate and safety participation.

Besides safety climate, a few other antecedents of safety performance were identified in previous research, among which leadership style received most attention (Christian, Bradley, Wallace, & Burke, 2009; Clarke, 2012; Griffin & Hu, 2013; Mullen, Kelloway, Teed, 2011). On one hand, it was argued that leadership styles influence safety performance through the process of social exchange, as subordinates and supervisors foster mutual trust and develop an exchange relationship (Hofmann & Morgeson, 1999). On the other hand, identification theory has been used to explain the influence of leadership safety behavior on subordinates' safety performance (Kark, Shamir, & Chen, 2003; Yukl, 1998). Specifically, subordinates identify with the leader and the group he/she leads by exhibiting behaviors that are performed and encouraged by the leaders. Clarke (2013) meta-analyzed previous research on relationships of transformational and

transactional leadership with safety performance, and found evidence consistent with the notion that the positive relationship between transformational leadership and safety participation is partially mediated by perceived safety climate while the positive relationships of active transactional leadership with safety participation and safety compliance are fully mediated by perceived safety climate.

The predictors and mediators described above usually predict the two components of safety performance differently. For example, transactional leadership only predicts safety compliance while transformational leadership and leadership-member exchange have a stronger influence on safety participation than on safety compliance (Christian et al., 2009). Safety inspiring behavior predicts safety participation while safety monitoring behavior is the sole predictor of safety compliance (Griffin & Hu, 2013). All these findings further demonstrate the usefulness of the framework proposed by Griffin and Neal (2000) given their similarity to findings in job performance.

Job demands and job resources, which were considered critical predictors of job performance, have also been studied in the safety performance literature. Job demands refer to "physical, social, or organizational aspects of the job that requires sustained physical or mental effort" while job resources refer to "physical, social, or organizational aspects of the job that may facilitate goal achieving, reduce the physical and psychological costs associated with job demand and help personal growth" (Makikangas, Bakker, Aunola, & Demerouti, 2010, p. 501). According to Job Demand-Resources Model (JD-R; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), job demands and job resources are associated with development of job stress and they interactively affect performance. Schaufeli and Taris (2014) indicated that employees have to put in extra effort and resources to prevent performance from decreasing when job demands are high.

This was referred as a performance protection strategy (Demerouti et al., 2001). However, when such efforts and resources are drained, performance will be reduced.

Li and colleagues (2013) demonstrated that the JD-R model can be applied to studying safety performance. When people have the same level of knowledge, skill and motivation, resources potentially increase engagement levels and enable an employee to execute the safety task he/she wants to do while overall demands may constrains employees' ability to perform safely (Li et al., 2013). They found job demands negatively influence safety performance through emotion exhaustion. Nahrangb, Morgeson and Hofman (2011) also demonstrated that job demands influence safety compliance through burnout.

Another stream of research in predicting safety performance lies in the research of occupational stressors' influence on safety performance. Clarke (2012) used the transactional theory of stress (Lazarus, 1990) to test a model using both challenge and hindrance stressors to predict safety performance. She argued that employees' perceptions and evaluations of whether stressors are threatening or challenging determine stressors' influence on performance. Her results showed that hindrance stressors were negatively related to both dimensions of safety performance while challenge stressors were marginally related to safety participation in a negative way.

While the effects of general demands and resources on safety performance were explored, much less attention has been paid to exploring the influences of specific occupational stressors acting as job demands on safety performance. Moreover, even less attention has been paid to the impact of negative interpersonal interactions among employees on safety performance. Thus, more studies exploring the effects of specific occupational stressors on safety performance are needed. This dissertation is designed to address these research gaps by examining effects of three

occupational stressors concerning interpersonal interactions, namely compulsory citizenship behavior, illegitimate tasks, and interpersonal conflict at work, on employees' safety performance.

Employee Wellbeing

Employee health and well-being have been getting increasing research attention in the past three decades. According to the transactional theory of stress (Lazarus, 1990), experiences of stressful events at work can be perceived as threats, and might have negative effects on employee health and well-being. Thus researchers have devoted great efforts to identifying these stressors and examining their effects on employee health and well-being. Example stressors include job characteristics such as workload and constraints (e.g., Spector & Jex, 1998), negative interpersonal interactions at work such as workplace aggression (e.g., Bowling & Beehr, 2006), and negative leadership styles such as abusive supervision (e.g., Tepper, 2000). While the literature seems clear that job stressors can negatively affect employee health and well-being, more work is needed to identify more occupational stressors that can negative affect employee health and well-being, and to uncover the process through which these negative effects unfold.

Compulsory Citizenship Behavior (CCB)

Organ and Ryan (1995) defined organizational citizenship behavior (OCB) as "performance that supports the social and psychological environment in which task performance takes place" (p. 86). Vigoda-Gadot (2006, p. 83) proposed the concept of compulsory citizenship behavior (CCB) as "a negative reflection of the social structure of OCB" which was induced by people in power who "extend the role definition of front-line employees and increase the pressure on them with the goal of lowering costs and increasing performance and outcomes through coercive tactics". For example, when a supervisor orders subordinates to stay longer

without paying them extra so that a task can be completed, the supervisor is forcing the subordinates to engage in citizenship behaviors.

According to coercive persuasion theory, people in power try to change subordinates' behavior and attitude by engaging in coercive and persuasive behaviors (Schein, Schneier, & Barker, 1961; Lifton, 1961; Ofshe & Singer, 1986). An example of such behavior is abusive supervision which was found to be positively related to CCB (Zhao, Peng, Han, Sheard, & Hudson, 2013). Thus, it was argued that the "good solider" behaviors in the form of citizenship behavior may not always be informal and voluntary; instead, it might be forced from front-line employees as extra-role behaviors and serves the purposes of those with authority. These behaviors might further drain employees' resource and efforts in addition to their regular job demands. Therefore, Vigoda-Gadot (2006) proposed that CCB is distinct from conventional OCB and task performance, and should be positively related to job stress, turnover intention and burnout while negatively related to job satisfaction and organizational commitment.

Another important statement made by Vigoda-Gadot (2006) was that since CCB is distinct from conventional OCB, the measure of OCB and the measure of CCB should be different from each other. He stated that the measure of CCB should take organizational political and communication factors into account and should be built upon the assumption that CCB is a form of extra-role "altruism" behavior that mostly happens in environments where employees are under high-level pressure to out-perform what was included in the job description.

Vigoda-Gadot (2007) developed a scale of CCB and tested his propositions by conducting a field study in the Israeli public education system. He found that up to 75% of the participants regularly experienced strong demands from people in power to engage in OCB. The results also clearly demonstrated that in opposition to conventional OCB, CCB's effects on

organizations and individuals are negative in general. It was found that CCB is negatively related to task performance, job attitudes and employee well-being, and positively related to job stress and perception of organizational politics (Vigoda-Gadot, 2007).

Although CCB is an interesting and potentially important construct, it has not received much research attention and its effects on organizations and employees have been rarely studied. To explore these effects, this dissertation will discuss how CCB might influence safety performance and well-being by first linking these concepts and then exploring the potential mediators for these relationships.

According to Job Demand-Resources Model (JD-R, Demerouti et al., 2001), increase in job demands and decrease in job resources will lead to increase in job strain of employees through health impairment process. Through this process, chronic job demands exhaust employees' mental and physical resources. In turn, this might lead to the depletion of energy and to increased physical and psychological health problems. When CCB is high, employees are forced into performing citizenship behavior, which may or may not be informally rewarded, and their time and energy will be consumed (Vigoda-Gadot, 2007). In this case, there is an increase in job demands and a decrease in job resources, which makes the job more stressful. Therefore, employees' attitudinal reaction to CCB is likely to be negative and its relationship with negative emotion should be positive (Vigoda-Gadot, 2007). In addition, the stress and negative emotion caused by CCB should lead to damage to employee well-being.

Vigoda-Gadot (2007) suggested that CCB results from people abusing their power, which makes the boundary between in-role performance and extra-role performance less clear to employees. Since the definitions of in-role behavior are different between employees and those people in power, those who are forced into performing citizenship behavior are less likely to be

clear about what is expected from them (Morrison, 1994). In other words, when CCB is high, employees are more confused about their role at work and are more likely to experience role ambiguity and conflict, that has been found to positively related to employee well-being (Schmidt, 2014).

Also in line with this argument is that CCB is an aspect of performance that may affect other aspects of performance. Therefore, it is likely that employees withhold time and effort from other tasks to compensate (Morrison, 1994; Vigoda-Gadot, 2007). It is also likely that they will sacrifice time for performing safety participation behavior since those are considered "contextual performance" which is not required in the job description. They may also reduce compliance with safety rules and policies due to increased negative emotion and role stressors, and decreased job attitudes.

Based on previous research and discussion above, I propose:

Hypothesis 1a: Compulsory citizenship behavior will be positively related to negative emotions (anger) and role stressors (role conflict, role ambiguity), and negatively related to job attitudes (job satisfaction, organizational commitment).

Hypothesis 1b: Compulsory citizenship behavior will be negatively related to employee well-being (burnout, physical symptoms).

Hypothesis 1c: Compulsory citizenship behavior will be negatively related to safety compliance and safety participation.

Hypothesis 1d: Negative emotions (anger), role stressors (role conflict, role ambiguity), and job attitudes (job satisfaction, organizational commitment) will mediate the relationship between compulsory citizenship behavior and employee well-being (burnout, physical symptoms).

Hypothesis 1e: Negative emotions (anger), role stressors (role conflict, role ambiguity), and job attitudes (job satisfaction, organizational commitment) will mediate the relationship between compulsory citizenship behavior and safety compliance and safety participation.

Illegitimate Tasks (IT)

Illegitimate tasks refer to tasks at work that are not aligned with the expectations from a given person, and thus violate ones' occupational and self-identify (Semmer, Tschan, Meier, Facchin, & Jacobshagen, 2010). There are two facets of illegitimate tasks, including unnecessary tasks which are tasks that should not have to be carried out at all (e.g., asking an employee to redo some paperwork that is no longer needed), and unreasonable tasks which are tasks that are not appropriate to ask from a specific person (e.g., asking an office secretary to pick up dry cleaning).

Although new as an organizational construct, it has been considered as an occupational stressor since the beginning (Semmer et al., 2010). The authors argued that illegitimate tasks is a distinct stressor that differs from organizational justice since it takes both legitimacy and the task itself into consideration. It was found that illegitimate tasks is related to various negative outcomes of employees. For example, researchers have reported that illegitimate tasks is positively related to stress and counterproductive work behavior, and negatively correlated with job satisfaction and performance (Björk, Bejerot, Jacobshagen, & Härenstam, 2013; Kottwitz et al., 2013; Semmer et al., 2010; Stocker, Jacobshagen, Semmer & Annen, 2010). Further, illegitimate tasks has been linked with physical indicators of strain, that is, higher level of cortisol (Kottwitz et al., 2013).

There are several possible ways that illegitimate tasks might lead to negative outcomes, including employee attitudes and emotions, job strains, safety performance and impaired well-

being. First, because of its nature of being "illegitimate", people are more likely to perceive it as unjust (Semmer et al., 2010). This perception will easily lead to negative emotional and behavioral reactions such as counterproductive work behavior, decreased job satisfaction and commitment, and increased negative emotion (Fox, Spector & Miles, 2001). Thus, it is also likely that when illegitimate tasks is high, instead of being "productive", employees will be "counterproductive" in terms of safety, and thus engage in less safety compliance and safety participation.

Second, being required to complete tasks that are either unnecessary or unreasonable threatens employees' occupational role and self-identity, which could lead to stressful reactions (Semmer et al., 2010). This is in line with the argument that illegitimate tasks and role conflict overlap with each other to some extent (Semmer et al., 2010). Moreover, when experiencing illegitimate tasks, employees are likely to experience strain (e.g., negative emotion, lowered job satisfaction, and lowered organizational commitment) (Semmer et al., 2010).

Third, it is also likely that illegitimate tasks act as a job demand that occupies employees' resources so that employees won't have enough resources to complete the regular tasks that should be expected from them. According to Job Demands and Resources Model (JD-R model; Demerouti et al., 2001), employees need to maintain performance by devoting extra efforts when job demands are high (Schaufeli & Taris, 2014). Therefore, it is likely that employees will not be able to comply with safety procedures and participate in promoting safety very well. Moreover, according to the JD-R model, job demands impair employees' well-being through a health impairment process (Demerouti et al., 2001). Thus, it is likely that illegitimate tasks will negatively impact employee's well-being.

In sum, it is reasonable to believe that illegitimate tasks as a stressor is likely to lead to increased negative emotions, decreased job attitude, and increased role stressors, which in turn will lead to decreased health and well-being, and decreased safety performance. Given the two dimensions; nature of illegitimate tasks, the current study intended to examine the dimensions separately.

Hypothesis 2a: Unnecessary tasks and unreasonable tasks will be positively related to negative emotions (anger) and role stressors (role conflict, role ambiguity), and negatively related to job attitudes (job satisfaction, organizational commitment).

Hypothesis 2b: Unnecessary tasks and unreasonable tasks will be negatively related to employee well-being (burnout, physical symptoms).

Hypothesis 2c: Unnecessary tasks and unreasonable tasks will be negatively related to safety compliance and safety participation.

Hypothesis 2d: Negative emotions (anger) and role stressors (role conflict, role ambiguity) and job attitudes (job satisfaction, organizational commitment) will mediate the relationship between unnecessary tasks and unreasonable tasks and employee well-being (burnout, physical symptoms).

Hypothesis 2e: Negative emotions (anger) and role stressors (role conflict, role ambiguity) and job attitudes (job satisfaction, organizational commitment) will mediate the relationship between unnecessary tasks and unreasonable tasks and safety compliance and safety participation.

Interpersonal Conflict at Work (ICAW)

Interpersonal conflict refers to the extent to which employees experience arguments with others at work (Spector & Jex, 1998). As a stressor that consumes employee resources, it is

likely that interpersonal conflict will lead to more tension and negative emotions, and influence employees' subsequent health and well-being (Spector & Bruk-Lee, 2008). For example, interpersonal conflict has been found to positively relate to negative emotions (Fox, Spector, & Miles, 2001) and negatively relate to job satisfaction and organizational commitment (Frone, 2000). Further, in a recent meta-analysis, Nixon, Mazzola, Bauer, Krueger, and Spector (2011) found that interpersonal conflict is positively related various physical symptoms such as backache, headache, and eye strain. Taken together, the findings suggest that interpersonal conflict as a social stressor tends to influence employees' emotions, attitudes, and health and well-being.

The effect of interpersonal conflict on several dimensions of employee performance has also been documented. Using a meta-analytic method, Lepine, Podsakoff, and Lepine (2005) found that hindrance stressors including interpersonal conflict positively predicted various strains (e.g., anxiety, burnout, and depression) and negatively predicted job performance. Further, several meta-analyses (e.g., Berry, Carpenter, & Barratt, 2012; Hershcovis et al., 2007) found that interpersonal conflict positively predicted employees' deviant behaviors. However, few if any studies have examined employees' safety performance as a distal outcome of interpersonal conflict. It has been established that interpersonal conflict relates to increased negative emotions and reduced motivation (Lepine et al., 2005), which are indicators of depleted employees resources and energy. Subsequently, employees' compliance with safety procedure and participation in promoting safety can be negatively influenced. Thus I proposed the following hypotheses.

Hypothesis 3a: Interpersonal conflict will be positively related to negative emotions (anger) and role stressors (role conflict, role ambiguity), and negatively related to job attitudes (job satisfaction, organizational commitment).

Hypothesis 3b: Interpersonal conflict will be negatively related to employee well-being (burnout, physical symptoms).

Hypothesis 3c: Interpersonal conflict will be negatively related to safety compliance and safety participation.

Hypothesis 3d: Negative emotions (anger), and job attitudes (job satisfaction, organizational commitment) will mediate the relationship between interpersonal conflict and employee well-being (burnout, physical symptoms).

Hypothesis 3e: Negative emotions (anger), and job attitudes (job satisfaction, organizational commitment) will mediate the relationship between interpersonal conflict and safety compliance and safety participation.

In this section, I propose two factors that may buffer the negative impacts of occupational stressors on safety performance and employee well-being.

Reception of Organizational Citizenship Behavior (ROCB) as a Moderator

Organ (1988) suggested that OCB frees time and resources for both supervisors and co-workers to be more productive. This potentially beneficial aspect of receiving OCB was often overlooked in previous studies. Che (2012) proposed a concept of Reception of OCB (ROCB) that enables the study of OCB to shift from the perspective of the performer to the perspective of the receiver. ROCB is a process through which employees receive help and support from other individuals in the forms of OCB. For example, when a co-worker voluntarily takes time to help another employee to finish his or her task, the target employee is considered a recipient of OCB

and the event is ROCB. Given the positive effects of OCB in predicting employee performance and well-being (Whitman, Van Rooy & Viswesvaran, 2010; Hoffman, Blair, Meriac & Woehr, 2007; Dalal, 2005), ROCB can be considered a type of resource which potentially buffers stress and promotes well-being. In this dissertation, I propose ROCB moderates the relationships between occupational stressors and safety performance as well as the relationships between occupational stressors and employees' well-being.

The initial research on ROCB suggested that ROCB is a multi-dimensional construct (Che, 2012). The sub-dimensions include informational support which refers to mentoring, coaching and advice giving behavior from one employee to another, tangible support which concerns direct aid and tangible help that employees get from co-worker, and intangible support which represents personal care and intangible help such as emotional support that employees give to each other. Previous results showed that ROCB is positively related to job performance, OCB performed by recipients, and employee's attitude toward the job, and is negatively related to job strain and turnover intension (Che, 2012).

ROCB's impact on the relationships between occupational stressors and safety performance and employee well-being can also be explained by the JD-R Model (Demerouti et al., 2001). On one hand, job demands impair employees' well-being through health impairment process. Specifically, job demands exhaust employees' job resources which in turn damages employees' well-being. On the other hand, job resources lead to positive outcome through a motivational process by which job resources exert employees' motivating potential and effort that lead to high level of work engagement, low level of cynicism, and in turn better performance (Bakker & Demerouti, 2007; Gagne & Deci, 2005). Together, job demands and job resources interactively determine the development of motivation and job strain (Demerouti et al., 2001) .

On the other hand, different types of job demands and job resources may interact in predicting job strain. Previous research has shown that job resources may buffer the negative impact of job demands on performance and job strain (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003). Such examples of job resources include performance feedback and social support that can be ROCB in this case (House, Landis, & Umberson, 1988; Haines, Hurlbert, & Zimmer, 1991).

In this study, I propose that ROCB will act as a job resource to buffer the negative effects of the three occupational stressors on safety performance and employees' well-being. When employees received OCB from co-workers at work, this process potentially frees up energy and resources for them to be able to engage in safety performance, motivates them to be more engaged in their work and buffers the effects of job demands on employees' well-being. For example, one individual would like to attend a safety meeting. However, he/she has another task assigned by the supervisor that needs to be done at the same time which prevents him/her from attending that safety meeting. In such a circumstance, if another employee steps in and offers help to this individual with the task, his/her time would be freed to attend the meeting, and thereby improve his/her performance on safety.

Hypothesis 4a: Reception of OCB will moderate the relationships between compulsory citizenship behavior and safety performance (safety compliance, safety participation), such that the negative relationship between CCB and safety performance will be weaker when ROCB is high.

Hypothesis 4b: Reception of OCB will moderate the relationships between unnecessary tasks and unreasonable tasks and safety performance (safety compliance, safety participation), such that the negative relationship between unnecessary and unreasonable tasks and safety performance will be weaker when ROCB is high

Hypothesis 4c: Reception of OCB will moderate the relationships between interpersonal conflict and safety performance (safety compliance, safety participation), such that the negative relationship between interpersonal conflict and safety performance will be weaker when ROCB is high

Hypothesis 5a: Reception of OCB will moderate the relationships between compulsory citizenship behavior and employee well-being (burnout, physical symptoms), such that the negative relationship between CCB and employee well-being will be weaker when ROCB is high

Hypothesis 5b: Reception of OCB will moderate the relationships between unnecessary and unreasonable tasks and employee well-being (burnout, physical symptoms), such that the negative relationship between unnecessary and unreasonable tasks and employee well-being will be weaker when ROCB is high

Hypothesis 5c: Reception of OCB will moderate the relationships between interpersonal conflict and employee (burnout, physical symptoms), such that the negative relationship between interpersonal conflict and employee well-being will be weaker when ROCB is high

Perceived Safety Climate as a Moderator

Perceived safety climate refers to the degree that employees believe that safety and safety performance is of high priority within an organization (Zohar, 2000). As an aspect of organizational climate, it represents employees' shared perception of how much safety performance is valued in an organization and whether such behavior will be expected, supported and rewarded (Schneider, 1990). Therefore, it influences employees' safety behaviors (Copper & Phillips, 2004). Specifically, when perceived safety climate is high, employees are encouraged to comply with safety rules and participate in safety initiatives that in turn improve safety outcomes.

The positive direct association between perceived safety climate and safety performance has been consistently demonstrated in previous research (Zohar, 2000).

Previous research also showed that perceived safety climate moderates the relationship between Leader-Member Exchange (LMX; represents the exchange between leaders and their subordinators) and safety performance (Hofmann, Morgeson, & Gerras, 2003). The authors argued that when safety climate is high, safety behavior is considered valuable behaviors to the organization; thus, employees are more likely to reciprocate high quality of LMX with more safety behaviors. Also based on previous research, it was argued that when safety climate is high, safety behavior is not only valued by the organization, it is also rewarded by the organization (Schneider, 1990). Therefore, it is logical to expect that when there is variation in people's perceptions of safety climate especially when they are from different organizations with different levels of safety priority, people will perform differently since those behaviors are believed to be valued and rewarded differently.

In other words, within positive safety climates, employees perceive that safety performance is strongly valued and rewarded and employees are given more incentive to comply with safety rules and participate in safety initiatives. In situations where they are trapped in stressful situations and less likely to put energy in safety performance, this incentive might still motivate employees to maintain high level of safety performance.

With a negative safety climate, however, safety performance is perceived as not valued and rewarded. Thus, employees are given less incentive to comply with safety rules and participate in safety initiatives. When their energy and time are taken away by job stressors, this effect might be stronger because they are less likely to follow safe practices. Based on this discussion, I propose the following hypotheses.

Hypothesis 6a: Perceived safety climate moderates the relationships between compulsory citizenship behavior and safety performance (safety compliance, safety participation), such that the negative relationship between CCB and employee safety performance will be weaker when perceived safety climate is high.

Hypothesis 6b: Perceived safety climate moderates the relationships between unnecessary and unreasonable tasks and safety performance (safety compliance, safety participation), such that the negative relationship between unnecessary and unreasonable tasks and employee safety performance will be weaker when perceived safety climate is high.

Hypothesis 6c: Perceived safety climate moderates the relationships between interpersonal conflict and safety performance (safety compliance, safety participation), such that the negative relationship between interpersonal conflict and employee safety performance will be weaker when perceived safety climate is high.

Table 1 in Appendix A summarizes the hypotheses of this dissertation.

The current study

There are three specific aims of this dissertation. First, the current study investigates the influences of three occupational stressors on safety performance and well-being. Second, I intend to investigate the underlying mechanisms of these relationships by exploring several potential mediators, including negative emotion, role stressors, and job attitudes. Last, this study also investigates whether ROCB and perceived safety climate can moderate the proposed negative impact of occupational stressors on employees' safety performance and well-being. The current study uses a daily diary method to examine the within-person relationships between occupational stressors and safety performance.

CHAPTER 2: METHOD

Participants

Registered nurses were chosen to be the target population of this study for the following reasons: first, nurses are under extreme work and time pressure to ensure safety for both the patients and themselves; second, the tasks nurses perform on a daily basis usually involve coordinating with each other and helping each other; third, the nature of nurses' work requires them to cover any gaps that may happen during patient care, which means that they are required to work extra hours or fill different roles if the department is understaffed which is usually the case.

To ensure power for detecting the proposed relationships and the overall model, I performed a power analysis based on the method suggested by Scherbaum and Ferreter (2009) given the daily diary design of the current study. Using a power analysis method for multi-level data including within individual level and between-individual variables suggested by Scherbaum and Ferreter (2009), an adequate power can be achieved by having 40 nurses for a medium effect size. To reach better statistical power to detect cross-level interaction effects as proposed in the current study, I would require a much larger sample size (Snijders, Steglich, & Schweinberger, 2007). In addition, 20% attrition was expected based on previous experience. Thus, current study looked for a minimum of 50 eligible nurses in the beginning.

Eligible participants were full-time nurses who were at least 18 years old and working 35 hours or more per week. I reached out to more than 20,000 eligible registered nurses with the Florida Nursing Board whose email addresses were available as public information. They were

asked to participate in this study for a $45 visa gift card upon completion. A total number of 137 nurses replied to the initial email with willingness to participate. Twenty-five of the 137 nurses dropped from the study after given more information about the study. Another 22 nurses dropped from the study after the baseline survey due to scheduling or availability problems. Finally, 71 nurses provided enough data for analyses that were included in this study.

Among the 71 final participants, 68 (95.8%) were females. This gender imbalance was due to the nature of the sample. The majority of the sample was white/Caucasian with 8 African-Americans, 4 Hispanic and 2 Asian. Sixty-one (85.9%) of the 71 participants held a degree equal or higher than a 4-year college degree. Most of the participants worked for more than 40 hours per week with an average work hour per week of 44.9 hours (*SD* = 12.06 hours). The average organization tenure of the sample was 88.3 months (about 7.3 years, *SD* = 78.82 months). Fourteen nurses worked in intensive care unit (any type) and 8 nurses worked in Psychiatry/mental health unit. There were no more than 5 nurses who came from the other types of units.

Procedure

Participant Recruitment: An email list with more than 63,000 email addresses from registered nurses with Florida Nursing Board was downloaded from their official website. I sent out initial recruiting emails to 500 names on the list everyday with general information of the study. More than two-thirds of the email addresses were either out of date or undeliverable. About 0.5% (137) nurses replied with the willingness to participate in the study. Those who replied were further contacted through email with more detailed information of the study including informed consent, method of contact, scheduling, payment of the gift card and

participants' right to drop from the study at any time. A research assistant helped the investigator with scheduling and maintaining the participants' records.

Data Collection: Participants were contacted via emails or phone calls after they returned the informed consent forms. The purposes of these contacts included explaining the data collection process to the participants, asking for permission to send them reminding emails every day, and answering questions that the participants may have. Participants were asked to provide start/end times and dates for 3 shifts per week over three weeks. They were contacted with the link to the right survey through emails. Table **1** shows the schedule for data collection and the measured variables for each survey. Specifically, on Monday morning the week before their first shift, the nurses receive the baseline survey for collecting their demographic information. Then the participants started to receive their daily after-shift survey one hour before their shifts ended according to the schedule they provided. Finally, on Friday morning of the next week after their last shift ended, they were asked to do a follow-up survey for measuring perceived safety climate and reception of OCB during the weeks they were doing the surveys.

Measures

The design of the survey is shown in Table **1** and the scales are displayed in Appendix B. There are three sets of surveys, including a baseline survey, daily after-shift surveys, and a follow-up survey. The baseline survey was administered one week before the beginning of daily surveys on Monday morning. Participants were asked to provide demographic information. During week 2 to week 4, participants were asked to select three shifts each week for keeping the daily surveys. For each shift, participants need to fill out an after shift survey reporting on their well-being, job attitude and role stressors measures plus the three occupational stressors, ROCB

and safety performance. Finally on Friday morning of week 5, participants were asked to report on all variables for the follow-up survey. The reliabilities for each scale were shown in Table **2**.

Perceived Safety Climate. Participants rated perceived safety climate using the 16-item safety climate questionnaire (Zohar & Luria, 2005). The items included a range of indicators that reflect top management's commitment to safety or the priority of safety over competing operational goals such as production speed and costs. All items were measured on a 5-point rating scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). An example item is "My supervisor discusses how to improve safety with us". When used in the baseline survey, the participants were asked to rate the items in reference to the last six months, while in the follow-up survey, the participants were asked to rate the items in reference to the study period. The alpha reliability of this scale was .96 for this study.

Compulsory Citizenship Behavior (CCB): A 3-item version of Vigoda-Gadot's (2007) five-item scale for CCB was used in the daily after shift survey in reference to the past shift (i.e. "During the past shift, …."). An example for this scale is "During the past shift, I feel that I am forced to assist my supervisor against my will and beyond my formal job obligations." Participants rated the items on a scale from 1 (*Never*) to 5 (*More than three times*). Higher scores on each of the items indicates higher frequency on the behavior of interest. The average alpha reliability of this scale was 0.70 in this study.

Illegitimate Tasks (IT). Unnecessary tasks and unreasonable tasks were each measured with 2 items of the Bern Illegitimate Tasks Scale (Semmer et al., 2013), respectively, in reference to the past period of time at work that day (i.e. "During the past shift, how many times did you have work tasks to take care of, which keep you wondering if"). An example for unnecessary tasks scale is "During the past shift, how many times did you have work tasks to

take care of, which keep you wondering if they have to be done at all." An example for unreasonable tasks scale is "During the past shift, how many times did you have work tasks to take care of, which keep you wondering if they have to be done at all?" Participants rated the items on a scale from 1 (*Never*) to 5 (*More than three times*). The average alpha reliability of unnecessary tasks scale was 0.87 and the average alpha of unreasonable tasks scale was 0.85 in this study.

Interpersonal Conflict at Work (ICAW). Three items from the 4-item Interpersonal Conflict at Work Scale (Spector & Jex, 1998) were used to measure daily interpersonal conflict, in reference to the past shift (i.e. "During the past shift, how many times did you experience each of the following events"). An example item is "During the past shift, how many times did you got into arguments with others at work? Participants rated the items on a scale from 1 (*Never*) to 5 (*More than three times*). The average alpha reliability of this scale was 0.70 in this study.

Physical Well-Being: Six items from Spector and Jex's (1998) Physical Symptom Inventory (PSI) were used to measure physical well-being, in reference to the past shift (i.e. "During the past shift, how many times did you experience each of the following symptoms"). An example item is "During the last shift, I had backache." Participants rated the items on a scale from 1 (*Never*) to 5 (*More than three times*). The average alpha reliability of this scale was 0.75 in this study.

Psychological Well-being. Three items of the emotional exhaustion scale from Demerouti, Mostert, and Bakker (2010) were used to measure psychological well-being, in reference to the past shift (i.e. "During the past shift, please indicate the degree of your agreement by selecting the number that corresponds with each statement"). An example item is "During the last shift, I feel emotionally drained." Participants rated the items on a scale from 1

(*Strongly Disagree*) to 5 (*Strongly Agree*). The average alpha reliability of this scale was 0.81 in this study.

Anger. Anger were measured using the 3-item scale in Caplan, Cobb, French, Van Harrison, and Penneau (1980). Participants was asked to rate in reference to the past shift to what extent they feel each of the given feelings at work, and response options ranged from 1 (*Not at all*) to 5 (*Very much*). One sample item was "I have felt angry". The average alpha reliability of this scale was 0.92 in this study.

Job Satisfaction. Job satisfaction was measured using a single item ("All in all, I am satisfied with my job") from the Michigan Organizational Assessment Questionnaire in Cammann, Fichman, Jenkins, and Klesh (1979). Participants were asked to what extent they agree with this item with response options ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree)*.

Organizational Commitment. Two items from Meyer, Allen and Smith's (1993) affective organizational commitment scale was used to measure organizational commitment, in reference to the past shift (i.e. "During the past shift, how do you feel about your job"). An example item is "During the past shift, I feel that I would be very happy to spend the rest of my career with this organization." Participants rated the items on a 5-point Likert scale ranging from 1 (*Disagree very much*) to 5 (*Agree very much*). The average alpha reliability of this scale was 0.86 in this study.

Role Stressors. Role ambiguity and role conflict were supposed to be measured using 2 items from Rizzo, Hourse, and Lirtzman (1970), respectively. However, due to a clerical error, role ambiguity was measured using one item and role conflict was measured using 3 items. The item for role ambiguity is "I know what my responsibilities are" (reversed), and an example item

for role conflict is “I receive incompatible requests from two or more people”. Participants rated the items on a scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The average alpha reliability of role conflict was 0.90 in daily survey in this study..

Reception of Organizational Citizenship Behavior (ROCB): The ROCB scale measures how frequently employees receive OCB from their co-workers in the workplace (Che, 2012). An initial 23 items of OCB-I dimension from three commonly used OCB scales were gathered (Podsakoff, MacKenzie, Moorman, & Fetter, 1990; Williams & Anderson, 1991; Spector, Bauer, & Fox, 2010). Fourteen items are included in the final scale after item analysis and factor analysis. An example item is “How many times has any of your co-workers voluntarily taken time to advice, coach, or mentor you today?” This version was used in follow-up survey in reference to the study period. Response options ranged from 1 (*Never*) to 5 (*Very often*). The coefficient alpha of this scale was 0.94.

Safety Performance: Two components of safety performance were assessed: Safety Compliance and Safety Participation (Neal, Griffin & Hart, 2000; Neal & Griffin, 2006). Each component was assessed with two items. An example item for safety compliance is “I use all the necessary safety equipment to do my job”. An example item for safety participation is “I promote the safety program within the organization”. Response options ranged from 1 (*Strongly disagree*) to 5 (*Strongly agree*). The average alpha reliabilities were 0.80 for safety participation and 0.86 for safety compliance in this study.

The surveys are displayed in Appendix C.

Data Analysis.

Hierarchical linear modeling (HLM) was used in this study given the structure of the data (HLM; Bryk & Raudenbush, 1992). Nine time points (level 1 unit) were nested in 71 individuals

(Level 2 unit) in this study. To test hypotheses 1, 2, 3, analyses using HLM were conducted at level 1, with level 1 predictors being group-mean centered. The direction and strength of level 1 relationships were represented using intercepts and slopes. Hypotheses 4, 5, 6 involved cross-level interactions, which were analyzed at both levels, and the direction and strength of cross level interactions were represented using intercepts and slopes. Significant relationships of the moderators with the slopes indicated significant moderation effects.

CHAPTER 3: RESULTS

Descriptive Analysis

Means, standard deviations, reliabilities, and inter-correlations of the studied variables from both levels were shown in Table 3. Except for job satisfaction measured using only one item, the mean reliabilities of the daily scales were all above .70, indicating those daily measures were reliable. Within-person correlations were calculated by correlating daily scores of each variable after subtracting individual means from each daily scores (Liu, Wang, Change, Chi, Zhou & Shao, 2015). Compulsory citizenship behavior, interpersonal conflict at work, unnecessary tasks and unreasonable tasks were significantly related to proposed mediators including anger, job satisfaction, organizational commitment, role conflict and role ambiguity except for the correlations of compulsory citizenship behavior and interpersonal conflict at work with role ambiguity. The correlations of anger, job satisfaction, organizational commitment, role conflict and role ambiguity with physical symptoms, burnout, safety participation and safety compliance were significant except for the one between role ambiguity and physical symptoms. In addition, compulsory citizenship behavior, interpersonal conflict at work, unnecessary task and unreasonable tasks were all significantly related to the two employee well-being variables. However only interpersonal conflict at work was significantly related to safety compliance among the 8 proposed associations between organizational stressors and safety performance. These results provided preliminary evidences for most of the proposed hypotheses.

To ensure there was enough between-person variance in the outcome variables for multilevel modeling in the following analyses, ICC(1) for burnout, physical symptoms, safety

compliance and safety participation were calculated and shown in Table **4**. The ICCs suggested that around 30% to 40% of the variance of the outcome variables were within individuals, indicating that HLM is appropriate for the data. ICC(1)s for predictor variables and mediating variables are also presented in the table. Except for organizational commitment, most of the variables showed adequate amount of within-person and between-person variability.

Multi-level confirmatory factor analysis was conducted to provide evidence for construct validity for the studied variables (i.e., compulsory citizenship behavior, unnecessary tasks, unreasonable tasks, interpersonal conflict at work, anger, job satisfaction, organizational commitment, role conflict, role ambiguity, safety compliance, safety participation, burnout, and physical symptoms). A few models were tested and shown in Table 5. First, a thirteen-factor model was tested by loading the items on their designated latent variables. The model fit index showed that the model fit the data well ($\chi^2_{(466,\ N = 661)} = 2{,}965.37$, $p < .01$, confirmatory fit index (CFI) = .93, root mean square error of approximation (RMSEA) = .05, standardized root mean square residual (SRMR) = .05, the correlations between factors range from .14 to .78 (*Mdn* = .34, $p < .01$). Then an eleven-factor model was specified by loading safety performance items onto one factor and burnout and physical symptoms items onto a single factor. The fit indices for this model were $\chi^2_{(489,\ N = 661)} = 4372.46$, $p < .01$, CFI = .85, RMSEA = .08, SRMR = .07, and the chi square difference test indicated significantly worse fit than the thirteen-factor model $\Delta\chi^2_{(23,\ N=661)} = 1407.09$, $p < .01$. Then two more models were tested by loading all predictor items onto one latent variable (ten-factor model) and by loading all mediator items onto one latent variable (nine-factor model). Both of them had significantly worse fit than the thirteen-factor model ($\Delta\chi^2_{(33,\ N=661)} = 4463.30$, $p < .01$; $\Delta\chi^2_{(42,\ N=661)} = 7463.56$, $p < .01$). Thus, the measures were distinct from each other and items loaded on their respective scales.

Hypotheses testing

Table 6 and Table 7 present unstandardized coefficients estimates and standard errors from HLM random intercepts and random slope models for hypotheses 1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b and 3c. At the within-person level, results show that:

a. Daily experience of CCB positively predicted anger, role conflict, burnout, physical symptoms, and negative predicted job satisfaction of the same day; CCB did not predict role ambiguity, organizational commitment, safety compliance, or safety participation. Hypothesis 1a was partially supported, hypothesis 1b was fully supported, and hypothesis 1c was not supported.
b. Daily experience of interpersonal conflict at work positively predicted anger, role conflict, burnout, physical symptoms, and negatively predicted organizational commitment of the same day; interpersonal conflict at work did not predict role ambiguity, job satisfaction, safety compliance, or safety participation. Hypothesis 2a was partially supported, hypothesis 2b was fully supported, and hypothesis 2c was not supported.
c. Daily experience of unnecessary tasks only positively predicted anger, role conflict, burnout and physical symptoms, and negatively predicted organizational commitment of the same day; it did not predict role ambiguity, job satisfaction, safety compliance, or safety participation; daily experience of unreasonable tasks only positively predicted anger, role conflict, burnout and physical symptoms, and negatively predicted jobs satisfaction and organizational commitment of the same day; it did not predict role ambiguity, safety compliance, or safety participation. Together,

hypothesis 3a was partially supported, hypothesis 3b was fully supported, and hypothesis 3c was not supported.

Given the existing non-significant findings, some of the proposed mediation hypotheses were unsupported. Therefore, indirect effects were only estimated using Mplus (Muthén & Muthén, 2010) when predictor-mediator and mediator-outcome relationships are both significant (Table 6 and Table 8). Table 9 shows the remaining possible mediation relationships that were tested, with significant indirect effects being consistent with the mediation hypotheses.

Hypotheses 1d and 1e stated that anger, job satisfaction, organizational commitment, role conflict and role ambiguity mediate the relationships between CCB and the two employee well-being variables and the relationships between CCB and safety performance, respectively. Table 10 and Table 11 show the results for hypothesis 1d. Accordingly, CCB had a significant indirect effect on burnout though role conflict and job satisfaction, but not through anger. A significant indirect effect was also found for anger when mediating the effect of CCB on physical symptoms. These findings provide partial support for hypothesis 1d. Table 12 shows the result for hypothesis 1e indicating that CCB had a significant indirect effect on safety compliance through anger. Hypothesis 1e was partially support.

Hypotheses 2d and 2e stated that anger, job satisfaction, organizational commitment, role conflict and role ambiguity mediate the relationships between interpersonal conflict at work and the two employee well-being variables and the relationships between interpersonal conflict at work and safety performance, respectively. Table 13 and Table 14 show the results for hypothesis 2d. Accordingly, interpersonal conflict at work had a significant indirect effect on subject's burnout though anger and role conflict. Significant indirect effect was also found for the effect of interpersonal conflict at work on physical symptoms through anger. Hypotheses 2d

was partially supported. Table **15** shows the result for hypothesis 2e that indicates that interpersonal conflict at work had a significant indirect effect on safety compliance through anger. Hypothesis 2e was partially support.

Hypotheses 3d and 3e state that anger, job satisfaction, organizational commitment, role conflict and role ambiguity mediate the relationships between illegitimate tasks (unnecessary tasks and unreasonable tasks) and the two employee well-being variables and the relationships between illegitimate tasks and safety performance, respectively. Table 16, Table 17, Table 19 and Table 20 show the results for hypothesis 3d. Accordingly, unreasonable task had a significant indirect effect on burnout through anger, role conflict, and job satisfaction, while unnecessary tasks had a significant indirect effect on burnout through anger and role conflict. Significant indirect effect was also found for the indirect effects of unreasonable task and unnecessary tasks on physical symptoms through anger. Hypotheses 3d was partially supported. Table 18 and Table 21 shows that unreasonable task and unnecessary tasks had significant indirect effects on safety compliance through anger. Hypothesis 3e was partially supported.

The last set of hypotheses stated that reception of OCB and perceived safety climate at the between-individual level would moderate the relationships between job stressors and employee well-being and safety performance at the within-individual level, respectively. For each of the hypotheses, a random slope was estimated using HLM for within-person relationships, and level -1 slope were then regressed on level 2 moderators (ROCB and perceived safety climate), respectively. A significant effect of level-2 moderator in predicting level 1 slope indicates a significant moderation effect (Table 22).

Table 23, Table 24, Table 27, Table 28, Table 31, Table 32, Table 35 and Table 36 show the results for hypotheses 4a, 4b, and 4c, testing the moderating effects of ROCB on within-

person relationships of stressors with safety performance. In Table 23 the main effect of CCB on safety compliance was not significant ($\gamma = 0.01$, $p = .145$), however, the interaction term was significant ($\gamma = -0.31$, $p < .05$). A plot of the moderating effect (see Figure 1) shows that when ROCB is high, participants' safety compliance performance is negative; when ROCB is low the relationship is positive. This result is not in line with what was proposed in hypothesis 4a that predicts the negative relationship should be weaker when ROCB is high comparing when it is low. In addition, as shown in Table 28, the main effect of unnecessary tasks on safety participation was not significant ($\gamma = -0.00$, $p = .0.926$), however, the interaction term was significant ($\gamma = 0.12$, $p < .05$). A plot of the moderating effect (see Figure 2) shows that when ROCB is high, participants' safety participation performance is positively related to unnecessary tasks. The direction changed in this relationship to negative when ROCB is low. Clearly this is not supporting what was proposed in hypothesis 4b that predicts that the relationship should be negative and it should be weaker when ROCB is high. Similarly, as shown in Table 32, the main effect of unreasonable tasks on safety participation was not significant ($\gamma = -0.04$, $p = .151$), however, the interaction term was significant ($\gamma = 0.10$, $p < .05$). A plot of the moderator effect (see Figure 3) shows that when ROCB is low the relationship is negative and when ROCB is high the relationship became positive. This is also not supporting what was proposed by hypothesis 4b. Finally, none of the other moderation effects was significant. Although some significant moderating effects were found, none of them were consistent with predictions in Hypothesis 4a, 4b, or 4c.

Table 26, Table 27, Table 29, Table 30, Table 33, Table 34, Table 37 and Table 38 show the results for hypotheses 5a, 5b and 5c, testing the moderating effects of perceived safety climate on within-person relationships of stressors with employee well-being. In Table 25, the

main effect of CCB on physical symptoms was significant ($\gamma = 0.11$, $p < .001$), and the interaction term was also significant ($\gamma = -0.05$, $p < .05$). A plot of the moderator effect (see Figure 4) shows that when ROCB is high the positive relationship between CCB and physical symptoms is weaker than when ROCB is low, suggesting ROCB buffers the positive effects of CCB on employee physical symptoms. Thus, hypothesis 5a that predicts that ROCB can buffer the negative impact of CCB on employee-wellbeing is partially supported. Similarly, the main effect terms and the interaction terms in Table 33 and Table 34 were significant for the relationships between unreasonable tasks and physical symptoms and the relationship between unreasonable tasks and burnout ($\gamma = 0.06$, $p < .01$, $\gamma = -0.06$, $p < .05$; $\gamma = 0.15$, $p < .05$, $\gamma = -0.13$, $p < .05$;). Hypothesis 5b predicts that when ROCB is high, the positive relationships between unreasonable tasks and unnecessary tasks and indicators of employee well-being should be weaker.

Figure 5 and Figure 6 show the patterns of relationships showing that when ROCB is high, the two positive relationships are weaker as compared to when ROCB is low. Thus, hypothesis 5b is partially supported. None of the other moderation effects were significant. Thus, hypotheses 5a and 5b were partially supported, while hypothesis 5c was not supported.

Table 39 and Table 46 show the results testing hypotheses 6a, 6b and 6c which predicted that perceived safety climate at between individual level moderates the relationships between CCB, interpersonal conflict at work, and illegitimate tasks and safety participations and safety compliance. However, none of the interaction terms for those relationships were significant. Thus none of these three hypotheses were supported in this study.

CHAPTER 4: DISCUSSION

The current study examined how occupational stressors influence nurses' safety performance and well-being through negative emotions (anger), job attitudes (job satisfaction and organizational commitment) and role stressors (role conflict and role ambiguity) on a daily basis. Moreover reception of organizational citizenship behaviors (ROCB) and perceived safety climate at the between-person level were hypothesized to moderate the within-person relationships between occupational stressors and employees' well-being and safety performance. It was found that within individuals the three studied occupational stressors were significantly related to employee well-being but not safety performance. Furthermore, the stressors had significant indirect effects on employee well-being through anger, job satisfaction, and role conflict The current study failed to find any main effect of the studied occupational stressors on safety performance. However, these stressors showed significant indirect effects on safety compliance through anger. Finally, it was found that reception of organizational citizenship behavior moderated some of the relationships between occupational stressors studied in this paper and employees' experience of burnout and physical symptoms. Specifically, when ROCB is high, the relationship between the occupational stressors and employees' well-being is weaker compared to when ROCB is low. Below, I will discuss the findings, their implications, the limitations of the current study and directions for future research.

Significant indirect effects were found for these three stressors on employee well-being through anger, job satisfaction and role conflict, providing evidence consistent with the

mediation hypotheses. These potential mediators help us understand how the negative effects of these stressors on employee health and well-being unfold. Based on the Affective Events Theory (AET; Weiss & Cropanzano, 1996), affective events (e.g., stressors) tend to lead to increased negative emotions and decreased job attitudes. Within individuals, the short-term effects of repeated experiences of stressors might have long-term cumulative effects on employee psychological and physical well-being. Further, the findings that these negative interpersonal interactions at work positively predict experience of role conflict are consistent with currently trending literature on identifying predictors of role stressors. For example, passive leadership has been found positively related to role conflict that further negatively affects employee health (Chênevert et al., 2013).

As a personal resource, reception of organizational citizenship behavior was found to buffer some of the negative effects of compulsory citizenship behavior, unnecessary tasks and unreasonable tasks, with employee well-being. This finding further strengthens the importance of receiving OCB for employees and organizations. Thus, while engaging OCB has been consistently found beneficial to employees, receiving OCB tends to increase employees' resources and helps employees better deal with negative experiences at work.

The current study failed to find significant main effects of the occupational stressors on the two domains of safety performance. One possible reason is that the current study only recruited nurses as participants. The nature of their work might make them experience more compulsory citizenship behavior, illegitimate tasks and interpersonal conflict at work. Thus, the episodes of occupational stressors might happen so often that the nurses have become more tolerant to those events when coming to performance. Another possible reason is the measurement of safety performance. The current study uses self-reports of safety performance.

Given the sensitive nature of safety in nursing, participants might not want to accurately report low safety performance. The relatively high mean scores of safety compliance and safety participation reflect this possibility.

Another possibility is that these stressors could force nurses to maintain high safety performance. For example, most hospitals have policies on patient hand off processes during shift change. A regular nurse usually takes care of 4 patients in a general hospital and the hand off process takes about 15 minutes per patient. This means either the nurse for the next shift needs to come a hour early or the nurse working the current shift needs to stay an hour longer for the process. And because of financial issues, they will not be paid for the extra hour. Another example might be the number of patients a regular nurse should take care of. Ideally, the patient nurse ratio should be 1.5 to 1. However, the common ratio in an average hospital is 3 to 1 during day shift and 4 to 1 during the night shift. All these experiences are similar to the stressors described in the study, and since this becomes very common in hospitals, nurses need to adapt to it and maintaining safety performance. The last possibility is that there is just no relationship between the studied occupational stressors and safety performance. Nevertheless, more studies examining the effects of stressors on safety performance are encouraged.

There are some interesting findings that future research could explore. First, indirect effects of these stressors on safety compliance through anger were found. These findings suggested that anger as a discrete negative emotion tends to carry over the effects of experiences of occupational stressors on safety performance. As proposed by AET, when experiencing increased stressors, employees' negative emotions (e.g., anger) tend to increase. The increased anger might make employees less focused on their work responsibilities and less likely to comply with rules about safety. Second, the significant moderating effects of ROCB on

relationships of stressors with safety performance were not consistent with what were predicted. For example, the negative compulsory citizenship behavior-safety compliance relationship was stronger when ROCB was high. One possible reason for this is that when receiving more OCB, employees are more likely to feel the pressure to engage in extra-role behaviors. Thus, their safety performance is more negatively affected. In addition, the finding that there was a stronger positive relationship between unnecessary tasks and unreasonable tasks with safety participation when ROCB is high might be consistent with the discussion above, suggesting that the presence of these stressors might force employees to maintain high safety performance, and that receiving citizenship behaviors from coworkers further strengthens this effect. However, given the inconsistent results, these findings should be interpreted with caution.

Theoretical and practical implications

The current research has several theoretical and practical implications. First, two of the three focal occupational stressors in this study, compulsory citizenship behaviors (Vigoda-Gadot, 2006) and illegitimate tasks (Semmer et al., 2015), have received little attention in the literature. On the one hand, previous research on compulsory citizenship behaviors rarely treats it as an occupational stressor; instead, they were focusing on the nature of the behavior and its relationship with organizational citizenship behavior (Vigoda-Gadot, 2006, 2007; Zhao, Peng, & Chen, 2014; Zhao, Peng, Han, Sheard & Hudson, 2013). On the other hand, although illegitimate tasks has often been framed as an occupational stressor, most previous studies on its effects used cross-sectional between-person designs, while within-person examination of its effects on employee well-being is fairly limited. In this study, I found that negative emotion, role stressors, and job attitudes mediated the effects of the studied occupational stressors on employees' well-being. This suggests that compulsory citizenship behaviors and illegitimate tasks also drain

employees' energy at work and might lead to physical symptoms through the creation of negative feelings. The findings provided preliminary evidence to consider compulsory citizenship behavior as a source of stress at work and further proved that illegitimate tasks' negative impacts on employees' health at the within-person level.

Second, the within-person negative effects of interpersonal conflict on employee health and well-being is consistent with previous studies using between-person designs (Spector & Jex, 1998). However, the significant relationships between interpersonal conflict at work and job satisfaction, role conflict and physical symptoms found in the current study were slightly weaker than what were reported in the previous between person designs (Spector & Jex, 1998; Girardi, Faico, Dal Corso, Kravina & Decarlo, 2011). This may due to the fact that the number of interpersonal conflict episode may fluctuate day by day. Finally, the significant indirect effects of interpersonal conflict at work on employee well-being through anger and role conflict provide potential explanations for the underlying mechanisms for how interpersonal conflict at work influence employee well-being.

Third, the research on ROCB (Che, 2012) was extended by this study. Previous study on ROCB found it could facilitate employees' performance while decreasing employees' stress (Che, 2012). In the end of that study, it was proposed that ROCB could mitigate the negative impacts of occupational stressors on employee well-being. The current study addressed that proposal by finding that ROCB buffers the positive relationships between the studied occupational stressors on employees' experience of burnout and physical symptoms. As most of previous studies on OCB focus on the beneficial effects of those behaviors on the performer such as job performance (Dalal, 2005), much less attention has been paid on the receiver, letting alone the positive effects that may occur to the receiver. As suggested by this study, receiving OCB

from co-worker is beneficial to the focal employee by buffering the negative effects of experienced stressors. More research should be devoted in this field to explore more potential beneficial effects of ROCB.

The current study has several valuable practical implications for organizations. First, the study showed that forcing employees to engage in extra-role behaviors or tasks that are believed to be unnecessary or unreasonable is detrimental to employee well-being. The employer may benefit from these situations since they saved money on hiring additional employees in the short run; however, they may suffer in the long run from the increased cost on insurance and employees absenteeism due to physical and emotional illness, in addition to the turnover issues cause by lower level of job satisfaction and organizational commitment.

Second, it was found that reception of OCB could buffer negative impacts the stressors have on employees' well-being. Thus, creating an environment within which employees are more likely to help each other is critical for organizations like hospitals. As mentioned previously, nurses regularly need to stay longer at work and cover for each other due to high level of workload, understaffing problems and the needs of patient care. These situations may be perceived similarly to what was described in the items for measuring compulsory citizenship behaviors and illegitimate tasks. However, it is so important that they can maintain a certain level of performance to overcome those situations at work since patients' life is on the line. Thus, creating an environment that can foster the culture of helping is critical for those organizations to maintain their performance. Employers should encourage their employees to help each other and provide necessary mechanisms to facilitate those processes.

Limitations

The current study suffered from several limitations. First, The investigator used self-reported data for all measures in this study that makes the findings potentially subject to common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The investigator did use different anchors for each scale, which has been suggested as a procedural control for reducing common method bias (Podsakoff et al., 2003).

Second, the predictors studied were measured in the same after shift survey as the mediators and outcomes, preventing the current study from making any causal conclusions among the variables. However, we did include an open ended question in the end of the after-shift survey asking about any comments the nurses may have on their work experience during the shift that they may want to share. Not surprisingly, quite a few of them complained about what they experienced during the shift caused their mood swings and changes in emotional exhaustion. These changes suggest that something happened during shift were the cause of the changes.

Third, the small sample size of the current study may be one of the reasons that several proposed relationships turned out to be nonsignificant. Theoretically, the sample size of the current study should be able to provide enough power for detecting within person level effects and cross-level moderations (Snijders et al., 2007). However, there were missing data in the data set, which caused some case deletions in the analyses. Thus, future research should recruit more participants and ensure the minimum level of missing data.

Fourth, the results of the current study failed to support the hypotheses regarding the relationships between studied occupational stressors and safety performance, failing to provide supports for what previous theories suggested. This may due to the fact that only nurses were

recruited as participants for this study. Nurses regularly need to stay longer at work or cover for other nurses because of the time needed for regular hand off processes, scheduling reasons, and understaffing issues in hospitals. These situations are included in the scope of compulsory citizenship behavior and illegitimate tasks. However, these forced behaviors are usually critical for patient care and required by safety policy in hospitals. According to this line of argument, the situations may attenuate the negative impacts of the studied occupational stressors on safety performance. Therefore, opposite to what was proposed in the first place, a nursing sample may not be a good choice for testing these hypotheses.

Fifth, the lack of other stressors in this study may hinder the interpretation of the results. Employees might suffer from multiple stressors at work. Without controlling for the effects of other occupational stressors and organizational factors that may negatively influence employee well-being and performance, the effects of the three occupational stressors in the current study on employee well-being is unclear.

Future Directions

There are a few directions where future research is encouraged to go. First, as mentioned earlier, the results in this study were based on self-reported data. As the predictors were measured by self-report ratings, the outcome variables studied in this paper might be best represented by other-report ratings or objective ratings. In the future, it is recommended that other researchers use multi-source ratings for performance and employee well-being in this line of research.

Second, the design of the current study limited its ability to establish causal relationships between the studied variables. Thus, the investigator urge the scholars to explore the causal relationships in the future by obtaining ratings during the day of their work and control other

factors that may cause changes in employee well-being and safety performance. Another way to do it would be observing employees' behavior right after each of the stressor episode happens.

Third, as mentioned above, nursing was the only occupation in this study. Future studies should first try to replicate the results in other occupations including in mixed samples. There may be unique occupational or organizational factors in the current sample that influenced the findings. For example, interactional justice was shown to be a moderator between the relationship of compulsory citizenship behavior and organizational citizenship behavior (Zhao, Peng & Chen, 2014). Thus, more moderators should be explored for this line of research.

Fourth, very limited research has treated compulsory citizenship behavior and illegitimate tasks as occupational stressors. The current study provides preliminary evidence for considering these two constructs as occupational stressors. Both of these constructs related to employee well-being and had significant indirect effects through employees' emotion. Therefore, future research should explore the relationships of these two stressors on other job strains and employee behaviors.

Fifth, the emotion model of job stress was one of many models that can be used to explain stress processes at work (Spector & Goh, 2001). Other models should be applied to understand how compulsory citizenship behavior and illegitimate task perform in alternative stress processes and what other theories can be used to explain their performance. For example, according to job demand and control model (Karasek, 1979), when job demand is high, employees experience more strain compared to when job demand is low. When employees under the pressure of engaging in extra-role behavior, unnecessary tasks, and unreasonable tasks, they might experience increased workload and more strain. In line with this theory, job control should

be able to mitigate the negative impacts of compulsory citizenship behavior and illegitimate tasks on employee well-being.

Sixth, the current study only explored the effects of three occupational stressors on employees in the work domain. Future research should expand the current findings to other domains in employees' life such as family domains. For example, employees may need to stay longer to complete their tasks because the stressors drained their resources and time, which may lead to work-family conflict. One of the items in the burnout survey asks about employees' energy level after work. The positive relationship between the stressors and burnout suggested low energy level after work. This provides preliminary evidence for looking into work-family conflict as a result of the studied stressors.

Finally, the current study failed to find support for the hypotheses regarding employees' safety performance. The results were in the proposed direction; however, they failed to reach statistical significance. Based on the discussion above, this may be caused by the use of nursing sample or small sample size. Thus, future research should use different samples or larger samples to study these relationships.

Conclusion

The current study tested hypotheses concerning the relationships between occupational stressors and employees' well-being and safety performance through daily experience of negative emotions, job attitudes and role stressors. The results supported that compulsory citizenship behavior, illegitimate tasks and interpersonal conflict at work significantly related to burnout (emotional exhaustion) and physical symptoms at a within-person level. Specifically, when the levels of occupational stressors were higher than their average level across the days, participants reported higher level of burnout and more physical symptoms. The study yielded no

significant results for safety performance indicating the studied occupational stressors had no within-person effects on participants' safety performance in the current sample. Moreover, findings on indirect effect analyses suggested that anger, role conflict and job satisfaction mediate the relationship between occupational stressors and employee well-being. Finally, the relationships between compulsory citizenship behavior and employee well-being, as well as the relationship between unreasonable tasks and employee well-being, were moderated by reception of organizational citizenship behavior. The current study enriched the research on compulsory citizenship behavior and illegitimate task by testing the pathway through which they influence employee's well-being and performance. It also provided more evidence for the stressor-emotion strain model proposed by Spector (1997). Moreover, it also has practical implication to the organizations by finding that reception of OCB could potentially buffer the negative effects of stressors on employee well-being.

TABLES

Table 1. Study design

Phases	Surveys	Names of Variables
Monday morning of week 1	Baseline Survey (Approximately 1 week before weekly survey)	Demographic information including age, race, education level, tenure in the organization, working unit and gender.
First shift of week 2 through third shift of week 4 after work (3 weeks, 9 days in total)	Daily Survey (After work)	Compulsory OCB, Illegitimate Tasks, Interpersonal Conflict, Reception of OCB, Anger, Job Satisfaction, Organizational Commitment, Role Stressor, Physical Well-being, Psychological Well-being, Safety Compliance, Safety Participation
Friday of week 5	Follow-up Survey (Approximately 1 week after weekly Survey)	ROCB and Perceived Safety Climate

Table 2. Scale reliability

Scale Name	Baseline	After shift*	Follow up
Predictor			
1. Compulsory Citizenship Behavior	NA	0.35-0.84	NA
2. Interpersonal Conflict at Work	NA	0.40-0.84	NA
3. Illegitimate Tasks	NA	0.85-0.90	NA
4. Unnecessary	NA	0.84-0.92	NA
5.Unreasonable	NA	0.70-0.93	NA
Mediator			
6. Anger	NA	0.90-0.96	NA
7. Organizational Commitment	NA	0.82-0.92	NA
8. Job Satisfaction	NA	NA	NA
9. Role Conflict	NA	0.83-0.95	NA
10. Role Ambiguity	NA	NA	NA
Outcome			
11. Physical Symptom	NA	0.63-0.78	NA
12. Burnout	NA	0.76-0.87	NA
13. Safety Performance	NA	0.77-0.92	NA
14. Safety Participation	NA	0.67-0.89	NA
15. Safety Compliance	NA	0.64-0.90	NA
Moderator			
16. Perceived Safety Climate	NA	NA	0.96
17. Reception of OCB	NA	NA	0.94

Table 3. Means, standard deviations, reliabilities, and correlations among study variables

Variable	M	Within-person SD	Between-person SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Level 1																		
1. Compulsory Citizenship Behavior	1.30	0.55	0.45	(.70)	.27	.29	.36	.16	.21	-.02	-.03	.25	-.24	-.05	-.04	.24	.05	NA
2. Interpersonal Conflict at Work	1.17	0.44	0.40	.75	(.70)	.24	.21	.13	.12	-.05	-.09	.28	-.09	-.16	-.03	.20	.06	NA
3. Unnecessary Task	2.14	1.19	1.04	.39	.36	(.87)	.46	.18	.20	.02	-.02	.18	-.08	-.11	-.06	.20	.14	NA
4. Unreasonable Task	1.90	1.08	0.92	.51	.55	.74	(.85)	.14	.19	-.05	-.05	.24	-.25	-.08	-.03	.33	.11	NA
5. Physical Symptoms	1.69	0.61	0.59	.51	.55	.28	.34	(.75)	.44	-.05	-.12	.32	-.23	-.17	-.09	.15	.14	NA
6. Burnout	3.17	1.00	0.82	.46	.36	.31	.47	.61	(.81)	.05	-.01	.38	-.35	-.26	-.03	.40	.17	NA
7. Safety Participation	4.10	0.70	0.61	-.02	-.02	-.10	-.23	-.02	-.19	(.80)	.41	-.05	-.01	.07	-.03	-.01	-.04	NA
8. Safety Compliance	4.24	0.65	0.55	-.12	-.20	-.27	-.28	-.06	-.16	.73	(.86)	-.11	.03	.10	-.07	-.03	-.00	NA
9. Anger	1.53	0.82	0.54	.44	.38	.31	.35	.43	.63	-.11	-.04	(.92)	-.45	-.31	.03	.38	.18	NA
10. Job Satisfaction	3.48	1.15	1.01	-.30	-.20	-.38	-.46	-.20	-.58	.32	.26	-.56	NA	.47	.00	-.34	-.02	NA
11. Organizational Commitment	3.09	1.16	1.13	-.25	-.18	-.28	-.33	-.26	-.54	.32	.17	-.41	.83	(.86)	-.07	-.21	-.01	NA
12. Role Ambiguity	1.70	0.69	0.58	.05	-.02	.11	.12	.04	.30	-.40	-.47	.20	-.25	-.27	NA	-.02	-.06	NA
13. Role Conflict	2.41	1.11	1.01	.59	.51	.55	.71	.24	.52	-.16	-.18	.59	-.48	-.32	.15	(.90)	.13	NA
14. Reception of OCB	1.51	0.54	0.40	-.18	-.17	-.10	-.23	.04	-.11	.19	.03	-.27	.28	.20	.15	-.37	(.66)	NA
Level 2																		
15. Perceived Safety Climate	3.27	NA	0.82	-.36	-.25	-.46	-.38	-.22	-.44	.06	.15	-.47	.53	.42	-.23	-.48	.24	(.96)
16. Reception of OCB	2.86		0.72	-.45	-.30	-.12	-.21	-.01	-.27	.09	-.02	-.49	.39	.30	.11	-.45	.65	.49

Note. Correlations above the diagonal are within-person-level correlations (N=619). Correlations below the diagonal are between-persons-level correlations (N=71) to calculate which Level-1 variables were aggregated to between-person level. Mean values of Cronbach's alpha coefficients are presented in parentheses along the diagonal.
Within level correlations bigger than .11 or smaller than -.11 are significant at .01 level. Within level correlations bigger than .08 or smaller than -.08 are significant at .05 level.
Between level correlations bigger than .32 or smaller than -.32 are significant at .01 level. Within level correlations bigger than .24 or smaller than -.24 are significant at .05 level.

Table 4. ICC(1) for studied variables

Variables	ICC-1
Burnout	0.60
Physical Symptoms	0.70
Safety Compliance	0.63
Safety Participation	0.70
Compulsory Citizenship Behavior	0.40
Unnecessary Tasks	0.67
Unreasonable Tasks	0.60
Interpersonal Conflict at Work	0.42
Anger	0.34
Job Satisfaction	0.75
Organizational Commitment	0.90
Role Conflict	0.75
Role Ambiguity	0.57

Table 5. Confirmatory factor analysis result

Model	χ^2	CFI	RMSEA	SRMR
Thirteen factors	$\chi^2_{(466, N = 661)} = 2{,}965.37$	.93	.05	.05
Eleven factors (outcome as two)	$\chi^2_{(489, N = 661)} = 4{,}372.46$	.85	.08	.07
Ten factors (predictor as one)	$\chi^2_{(499, N = 661)} = 7{,}428.67$	.82	.10	.10
Nine factors (mediator as one)	$\chi^2_{(508, N = 661)} = 10{,}428.93$	.73	.12	.11

Table 6. Effects of organizational stressors on targets' safety compliance, safety participation, burnout, and physical symptoms

	Safety Participation	Safety Compliance	Burnout	Physical Symptoms
		Coefficients (*SE*)		
Intercept	4.10 (0.08)***	4.24 (0.07)***	3.17 (0.10)***	1.70 (0.07)***
Level 1 Predictor				
Compulsory OCB	-0.02(0.04)	-0.03(0.05)	0.34(0.08) ***	0.15(0.04) ***
Interpersonal Conflict at Work	-0.06(0.04)	-0.11(0.07)	0.25(0.11) *	0.16(0.07) *
Unnecessary Task	0.01(0.03)	-0.01(0.02)	0.19(0.04) ***	0.10(0.03) ***
Unreasonable Task	-0.03(0.03)	-0.03(0.03)	0.19(0.06) **	0.08(0.03) **

*Note: *p < .05, ** p < .01, *** p< .001*

Table 7. Effects of organizational stressors on targets' anger, job satisfaction, organizational commitment, role conflict and role ambiguity

	Anger	Job Satisfaction	Organizational Commitment	Role Conflict	Role Ambiguity
			Coefficients (*SE*)		
Intercept	1.53 (0.07)***	3.52 (0.12)***	3.09 (0.14)***	2.36 (0.12)***	1.71 (0.07)***
Level 1 Predictor					
Compulsory OCB	0.41(0.10) ***	-0.34(0.09) ***	-0.05(0.04)	0.34(0.08) ***	-0.04(0.05)
Interpersonal Conflict at Work	0.59(0.17) **	-0.16(0.12)	-0.18(0.07) *	0.35(0.10) ***	-0.04(0.04)
Unnecessary Task	0.19(0.07) **	-0.07(0.04)	-0.06(0.02) *	0.17(0.05) ***	-0.04(0.04)
Unreasonable Task	0.25(0.07) **	-0.22(0.05) ***	-0.05(0.02) *	0.28(0.05) ***	-0.02(0.03)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 8. Effects of mediators on targets' safety compliance, safety participation, burnout, and physical symptoms

	Safety Participation	Safety Compliance	Burnout	Physical Symptoms
		Coefficients (*SE*)		
Intercept	4.10 (0.08)***	4.24 (0.07)***	3.17 (0.10)***	1.70 (0.07)***
Level 1 Predictor				
Anger	-0.03(0.03)	-0.07(0.04)*	0.21(0.05) ***	0.15(0.03) ***
Job Satisfaction	-0.05(0.04)	-0.05(0.05)	-0.15(0.11) *	-0.05(0.07)
Organizational Commitment	0.09(0.05)	0.10(0.06)	-0.13(0.10)	-0.05(0.05)
Role Conflict	-0.00(0.03)	0.01(0.04)	0.28(0.06) ***	0.01(0.03)
Role Ambiguity	-0.02(0.04)	-0.06(0.05)	-0.04(0.05)	-0.08(0.03) *

*Note: *p < .05, ** p < .01, *** p< .001*

Table 9. Tested mediation relationship based on above results

	Predictors	Mediators	Outcomes
1	CCB	Anger	Burnout
2	CCB	Role conflict	Burnout
3	CCB	Job satisfaction	Burnout
4	CCB	Anger	Physical symptom
5	CCB	Anger	Safety compliance
6	Interpersonal conflict	Anger	Burnout
7	Interpersonal conflict	Role conflict	Burnout
8	Interpersonal conflict	Anger	Physical symptom
9	Interpersonal conflict	Anger	Safety compliance
10	Unreasonable tasks	Anger	Burnout
11	Unreasonable tasks	Role conflict	Burnout
12	Unreasonable tasks	Job satisfaction	Burnout
13	Unreasonable tasks	Anger	Physical symptom
14	Unreasonable tasks	Anger	Safety compliance
15	Unnecessary tasks	Anger	Burnout
16	Unnecessary tasks	Role conflict	Burnout
17	Unnecessary tasks	Anger	Physical symptom
18	Unnecessary tasks	Anger	Safety compliance

Table 10. Mediating effects of anger, role conflict and job satisfaction in relationships between CCB and burnout

	Coefficient	SE	90% Confidence Interval	
CCB--> Anger	0.95***	0.03	0.91	0.99
Anger--->Burnout	0.26	0.22	-0.1	0.61
Indirect Effect	0.24	0.2	-0.09	0.58
CCB--> Role Conflict	0.97***	0.02	0.94	1.01
Role Conflict--->Burnout	0.75**	0.22	0.4	1.11
Indirect Effect	0.73***	0.22	0.38	1.09
CCB--> Job Satisfaction	0.98***	0.02	0.94	1.02
Job Satisfaction-->Burnout	0.6**	0.21	0.24	0.95
Indirect Effect	0.58***	0.21	0.24	0.93

*Note: *p < .05, ** p < .01, *** p< .001*

Table 11. Mediating effect of anger in relationships between CCB and physical symptoms

	Coefficient	SE	90% Confidence Interval	
CCB--> Anger	0.95***	0.03	0.91	0.99
Anger--->Physical Symptoms	0.75**	0.22	0.39	1.1
Indirect Effect	0.71***	0.2	0.39	1.03

*Note: *p < .05, ** p < .01, *** p< .001*

Table 12. Mediating effect of anger in relationships between CCB and safety compliance

	Coefficient	SE	90% Confidence Interval	
CCB--> Anger	0.95***	0.03	0.91	1.04
Anger---> Safety Compliance	0.25	0.22	-0.31	0.99
Indirect Effect	0.24	0.21	-0.11	0.57

*Note: *p < .05, ** p < .01, *** p< .001*

Table 13. Mediating effects of anger and role conflict in relationships between interpersonal conflict and burnout

	Coefficient	SE	90% Confidence Interval	
Interpersonal Conflict--->Anger	0.94***	0.03	0.89	0.98
Anger--->Burnout	0.41*	0.22	0.05	0.76
Indirect Effect	0.38*	0.2	0.05	0.71
Interpersonal Conflict--->Role Conflict	0.96***	0.03	0.91	1
Role Conflict--->Burnout	0.8***	0.18	0.51	1.1
Indirect Effect	0.77***	0.18	0.48	1.06

*Note: *p < .05, ** p < .01, *** p< .001*

Table 14. Mediating effect of anger in relationships between interpersonal conflict and physical symptoms

	Coefficient	SE	90% Confidence Interval	
Interpersonal Conflict--->Anger	0.94***	0.03	0.89	0.98
Anger--->Physical Symptoms	0.8***	0.18	0.5	1.09
Indirect Effect	0.74***	0.16	0.48	1.01

*Note: *p < .05, ** p < .01, *** p< .001*

Table 15. Mediating effect of anger in relationships between interpersonal conflict and safety compliance

	Coefficient	SE	90% Confidence Interval	
Interpersonal Conflict--->Anger	0.94***	0.03	0.89	0.98
Anger--->Safety Compliance	0.4*	0.22	0.03	0.76
Indirect Effect	0.37*	0.21	0.03	0.71

*Note: *p < .05, ** p < .01, *** p< .001*

Table 16. Mediating effects of anger, role conflict and job satisfaction in relationships unreasonable tasks and burnout

	Coefficient	SE	90% Confidence Interval	
Unreasonable Tasks-->Anger	0.89***	0.04	0.84	0.95
Anger--->Burnout	0.71***	0.18	0.42	1
Indirect Effect	0.64***	0.15	0.38	0.89
Unreasonable Tasks-->Role Conflict	0.92***	0.04	0.86	0.97
Role Conflict--->Burnout	1.00***	0.01	0.99	1.01
Indirect Effect	0.91***	0.04	0.86	0.97
Unreasonable Tasks-->Job Satisfaction	0.92***	0.05	0.87	0.98
Job Satisfaction-->Burnout	0.85***	0.12	0.66	1.05
Indirect Effect	0.79***	0.11	0.62	0.96

*Note: *p < .05, ** p < .01, *** p< .001*

Table 17. Mediating effects of anger in relationships unreasonable tasks and physical symptoms

	Coefficient	SE	90% Confidence Interval	
Unreasonable Tasks-->Anger	0.87***	0.04	0.8	0.95
Anger--->Physical Symptoms	0.88***	0.12	0.68	0.88
Indirect Effect	0.77***	0.1	0.61	0.93

*Note: *p < .05, ** p < .01, *** p< .001*

Table 18. Mediating effects of anger in relationships between unreasonable tasks and safety compliance

	Coefficient	SE	90% Confidence Interval	
Unreasonable Tasks-->Anger	0.89***	0.04	0.84	0.95
Anger--->Safety Compliance	0.43*	0.19	0.12	0.75
Indirect Effect	0.39*	0.17	0.11	0.66

*Note: *p < .05, ** p < .01, *** p< .001*

Table 19. Mediating effects of anger, role conflict and job satisfaction in relationships unnecessary tasks and burnout

	Coefficient	SE	90% Confidence Interval	
Unnecessary Tasks-->Anger	0.87***	0.04	0.8	0.95
Anger--->Burnout	0.65***	0.18	0.34	0.95
Indirect Effect	0.56***	0.15	0.32	0.81
Unnecessary Tasks-->Role Conflict	0.9***	0.04	0.82	0.97
Role Conflict--->Burnout	0.88***	0.12	0.69	1.08
Indirect Effect	0.79***	0.11	0.61	0.97

*Note: *p < .05, ** p < .01, *** p< .001*

Table 20. Mediating effects of anger in relationships unnecessary tasks and physical symptoms

	Coefficient	SE	90% Confidence Interval	
Unnecessary Tasks-->Anger	0.9***	0.04	0.86	1.07
Anger--->Physical Symptoms	0.85***	0.14	0.63	1.08
Indirect Effect	0.76***	0.1	061	0.93

*Note: *p < .05, ** p < .01, *** p< .001*

Table 21. Mediating effects of anger in relationships between unnecessary tasks and safety compliance

	Coefficient	SE	90% Confidence Interval	
Unnecessary Tasks-->Anger	0.87***	0.04	0.8	0.95
Anger--->Safety Compliance	0.65*	0.19	0.35	0.96
Indirect Effect	0.67*	0.16	0.31	0.83

*Note: *p < .05, ** p < .01, *** p< .001*

Table 22. Tested moderation pathway

	Predictors	Moderator	Outcomes
1	CCB	ROCB	Safety Performance
2	CCB	ROCB	Well-being
3	CCB	PSC	Safety performance
4	Interpersonal conflict	ROCB	Safety Performance
5	Interpersonal conflict	ROCB	Well-being
6	Interpersonal conflict	PSC	Safety performance
7	Unreasonable tasks	ROCB	Safety Performance
8	Unreasonable tasks	ROCB	Well-being
9	Unreasonable tasks	PSC	Safety performance
10	Unnecessary tasks	ROCB	Safety Performance
11	Unnecessary tasks	ROCB	Well-being
12	Unnecessary tasks	PSC	Safety performance

Table 23. Reception of OCB moderating effects of CCB on safety compliance

	Safety Compliance
	Coefficients (*SE*)
Intercept	4.24(0.07)***
Level 1 Predictor	
CCB	0.01(0.07)
Level 2 Predictor	
ROCB	-0.24(0.15)
Cross-level Interaction	
CCB * ROCB	-0.31 (0.17)*

*Note: *p < .05, ** p < .01, *** p< .001*

Table 24. Reception of OCB moderating effects of CCB on safety participation

	Safety participation
	Coefficients (*SE*)
Intercept	4.08(0.08)***
Level 1 Predictor	
Compulsory citizenship behavior	-0.03(0.03)
Level 2 Predictor	
ROCB	0.17(0.09)
Cross-level Interaction	
Compulsory citizenship behavior * ROCB	0.01(0.03)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 25. Reception of OCB moderating effects of CCB on physical symptoms

	Physical Symptoms
	Coefficients (*SE*)
Intercept	1.74 (0.07)***
Level 1 Predictor	
CCB	0.11(0.03)***
Level 2 Predictor	
ROCB	-0.02(0.07)
Cross-level Interaction	
CCB * ROCB	-0.05 (0.03)*

*Note: *p < .05, ** p < .01, *** p< .001*

Table 26. Reception of OCB moderating effects of CCB on burnout

	Burnout
	Coefficients (*SE*)
Intercept	3.12(0.11)***
Level 1 Predictor	
Compulsory citizenship behavior	0.30(0.10)**
Level 2 Predictor	
ROCB	-0.29(0.16)
Cross-level Interaction	
Compulsory citizenship behavior * ROCB	0.02(0.08)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 27. Reception of OCB moderating effects of unnecessary tasks on safety compliance

	Safety compliance
	Coefficients (*SE*)
Intercept	4.22(0.07)***
Level 1 Predictor	
Unnecessary tasks	-0.11(0.02)
Level 2 Predictor	
ROCB	0.09(0.08)
Cross-level Interaction	
Unnecessary tasks * ROCB	0.03(0.02)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 28. Reception of OCB moderating effects of unnecessary tasks on safety participation

	Safety Participation
	Coefficients (*SE*)
Intercept	4.10 (0.08)***
Level 1 Predictor	
Unnecessary tasks	-0.00 (0.03)
Level 2 Predictor	
ROCB	-0.24(0.18)
Cross-level Interaction	
Unnecessary tasks * ROCB	0.12 (0.06)*

*Note: *p < .05, ** p < .01, *** p< .001*

Table 29. Reception of OCB moderating effects of unnecessary tasks on physical symptoms

	Physical symptoms
	Coefficients (*SE*)
Intercept	1.63(0.07)***
Level 1 Predictor	
Unnecessary tasks	0.06(0.03)*
Level 2 Predictor	
ROCB	-0.01(0.06)
Cross-level Interaction	
Unnecessary tasks * ROCB	-0.00(0.03)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 30. Reception of OCB moderating effects of unnecessary tasks on burnout

	Burnout
	Coefficients (*SE*)
Intercept	3.12(0.11)***
Level 1 Predictor	
Unnecessary tasks	0.19(0.05)***
Level 2 Predictor	
ROCB	-0.30(0.16)
Cross-level Interaction	
Unnecessary tasks * ROCB	-0.02 (0.06)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 31. Reception of OCB moderating effects of unreasonable tasks on safety compliance

	Safety compliance
	Coefficients (*SE*)
Intercept	4.22(0.07)***
Level 1 Predictor	
Unreasonable tasks	-0.03(0.03)
Level 2 Predictor	
ROCB	0.08(0.08)
Cross-level Interaction	
Unreasonable tasks * ROCB	0.02(0.03)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 32. Reception of OCB moderating effects of unreasonable tasks on safety participation

	Safety participation
	Coefficients (*SE*)
Intercept	4.10(0.08)***
Level 1 Predictor	
Unreasonable tasks	-0.04(0.03)
Level 2 Predictor	
ROCB	-0.24(0.18)
Cross-level Interaction	
Unreasonable tasks * ROCB	0.10(0.05)*

*Note: *p < .05, ** p < .01, *** p< .001*

Table 33. Reception of OCB moderating effects of unreasonable tasks on physical symptoms

	Physical Symptoms
	Coefficients (*SE*)
Intercept	1.73(0.07)***
Level 1 Predictor	
Unreasonable tasks	0.06(0.02)**
Level 2 Predictor	
ROCB	-0.03(0.07)
Cross-level Interaction	
Unreasonable tasks * ROCB	-0.06 (0.03)*

*Note: *p < .05, ** p < .01, *** p< .001*

Table 34. Reception of OCB moderating effects of unreasonable tasks on burnout

	Burnout
	Coefficients (*SE*)
Intercept	3.22 (0.10)***
Level 1 Predictor	
Unreasonable tasks	0.15(0.06)*
Level 2 Predictor	
ROCB	-0.38(0.14)*
Cross-level Interaction	
Unreasonable tasks * ROCB	-0.13 (0.07)*

*Note: *p < .05, ** p < .01, *** p< .001*

Table 35. Reception of OCB moderating effects of interpersonal conflict at work on safety compliance

	Safety compliance
	Coefficients (*SE*)
Intercept	4.22(0.07)***
Level 1 Predictor	
Interpersonal conflict at work	-0.13(0.06)*
Level 2 Predictor	
ROCB	0.08(0.08)
Cross-level Interaction	
Interpersonal conflict at work * ROCB	-0.08(0.06)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 36. Reception of OCB moderating effects of interpersonal conflict at work on safety participation

	Safety participation
	Coefficients (*SE*)
Intercept	4.08(0.08)***
Level 1 Predictor	
Interpersonal conflict at work	-0.06(0.05)*
Level 2 Predictor	
ROCB	0.17(0.11)*
Cross-level Interaction	
Interpersonal conflict at work * ROCB	-0.01(0.05)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 37. Reception of OCB moderating effects of interpersonal conflict at work on physical symptoms

	Physical symptoms
	Coefficients (*SE*)
Intercept	1.62(0.07)***
Level 1 Predictor	
Interpersonal conflict at work	0.15(0.04)***
Level 2 Predictor	
ROCB	-0.01(0.06)
Cross-level Interaction	
Interpersonal conflict at work * ROCB	-0.08(0.09)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 38. Reception of OCB moderating effects of interpersonal conflict at work on burnout

	Burnout
	Coefficients (*SE*)
Intercept	3.12(0.11)***
Level 1 Predictor	
Interpersonal conflict at work	0.37(0.15)**
Level 2 Predictor	
ROCB	-0.29(0.16)
Cross-level Interaction	
Interpersonal conflict at work * ROCB	-0.02(0.20)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 39. Perceived safety climate moderating effects of CCB on safety compliance

	Safety Compliance
	Coefficients (*SE*)
Intercept	4.22(0.07)***
Level 1 Predictor	
Compulsory citizenship behavior	0.02(0.07)
Level 2 Predictor	
Perceived safety climate	0.06(0.09)
Cross-level Interaction	
Compulsory citizenship behavior * Perceived safety climate	0.14(0.09)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 40. Perceived safety climate moderating effects of CCB on safety participation

	Safety Participation
	Coefficients (*SE*)
Intercept	4.08(0.08)***
Level 1 Predictor	
Compulsory citizenship behavior	-0.02 \(0.04)
Level 2 Predictor	
Perceived safety climate	-0.00(0.10)
Cross-level Interaction	
Compulsory citizenship behavior * Perceived safety climate	0.04(0.05)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 41. Perceived safety climate moderating effects of unnecessary tasks on safety compliance

	Safety compliance
	Coefficients (*SE*)
Intercept	4.22(0.07)***
Level 1 Predictor	
Unnecessary tasks	-0.02(0.03)
Level 2 Predictor	
Perceived safety climate	0.06(0.09)
Cross-level Interaction	
Unnecessary tasks * Perceived safety climate	0.01(0.03)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 42. Perceived safety climate moderating effects of unnecessary tasks on safety participation

	Safety participation
	Coefficients (*SE*)
Intercept	4.08(0.08)***
Level 1 Predictor	
Unnecessary tasks	0.02(0.03)
Level 2 Predictor	
Perceived safety climate	-0.01(0.10)
Cross-level Interaction	
Unnecessary tasks * Perceived safety climate	-0.02(0.02)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 43. Perceived safety climate moderating effects of unreasonable tasks on safety compliance

	Safety compliance
	Coefficients (*SE*)
Intercept	4.22(0.07)***
Level 1 Predictor	
Unreasonable tasks	-0.03(0.03)
Level 2 Predictor	
Perceived safety climate	0.06(0.09)
Cross-level Interaction	
Unreasonable tasks * Perceived safety climate	0.02(0.03)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 44. Perceived safety climate moderating effects of unreasonable tasks on safety participation

	Safety participation
	Coefficients (*SE*)
Intercept	4.08(0.08)***
Level 1 Predictor	
Unreasonable tasks	-0.02(0.03)
Level 2 Predictor	
Perceived safety climate	0.01(0.10)
Cross-level Interaction	
Unreasonable tasks * Perceived safety climate	0.01(0.02)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 45. Perceived safety climate moderating effects of interpersonal conflict at work on safety compliance

	Safety compliance
	Coefficients (*SE*)
Intercept	4.22(0.07)***
Level 1 Predictor	
Interpersonal conflict at work	-0.13(0.07)*
Level 2 Predictor	
Perceived safety climate	0.06(0.09)
Cross-level Interaction	
Interpersonal conflict at work * Perceived safety climate	-0.06(0.06)

*Note: *p < .05, ** p < .01, *** p< .001*

Table 46. Perceived safety climate moderating effects of interpersonal conflict at work on safety participation

	Safety participation
	Coefficients (*SE*)
Intercept	4.08(0.08)***
Level 1 Predictor	
Interpersonal conflict at work	-0.06(0.05)
Level 2 Predictor	
Perceived safety climate	-0.01(0.10)
Cross-level Interaction	
Interpersonal conflict at work * Perceived safety climate	-0.01(0.04)

*Note: *p < .05, ** p < .01, *** p< .001*

FIGURES

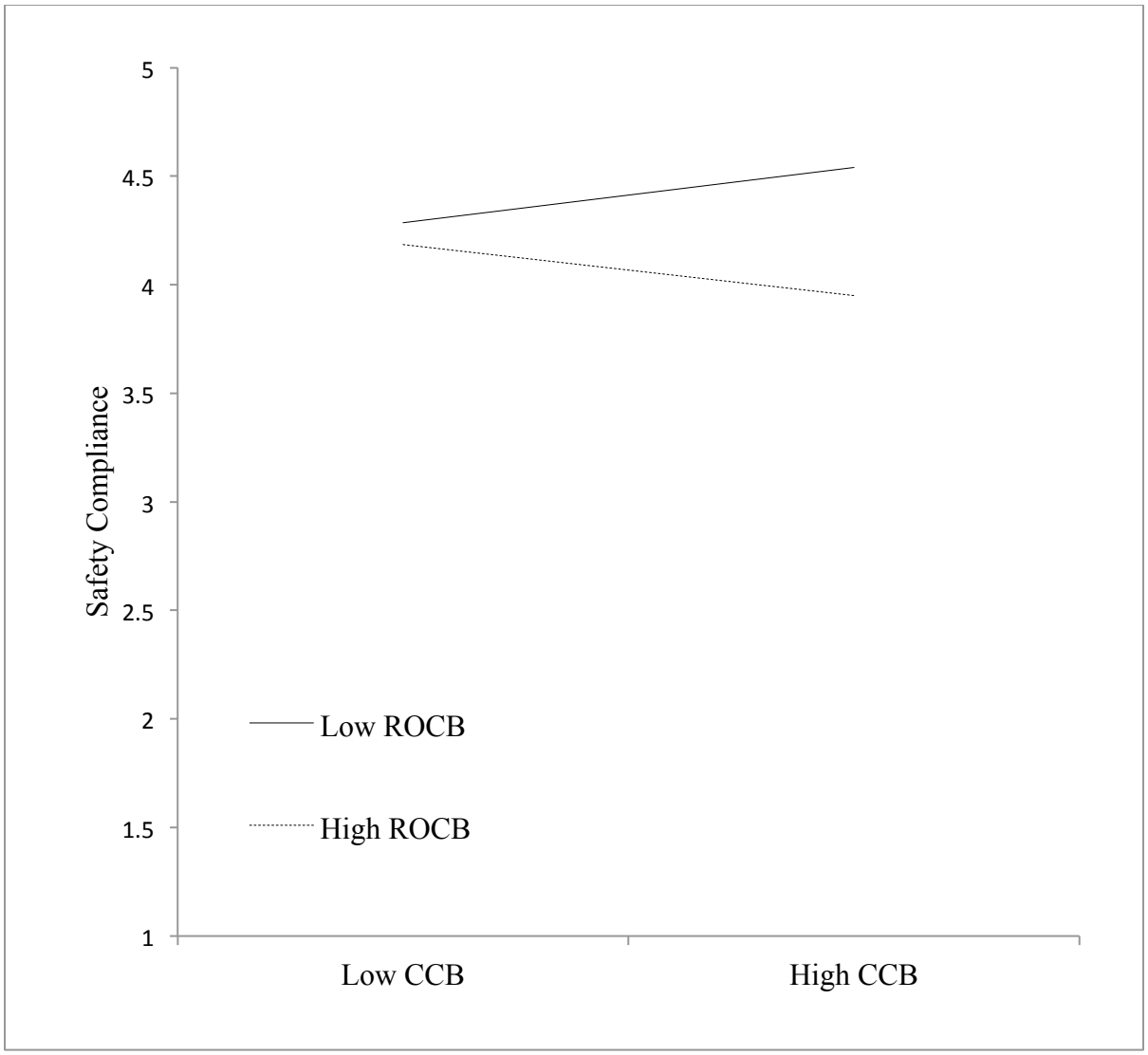

Figure 1. Interaction between participants' compulsory citizenship behavior and reception of OCB in predicting subjects' safety compliance behavior

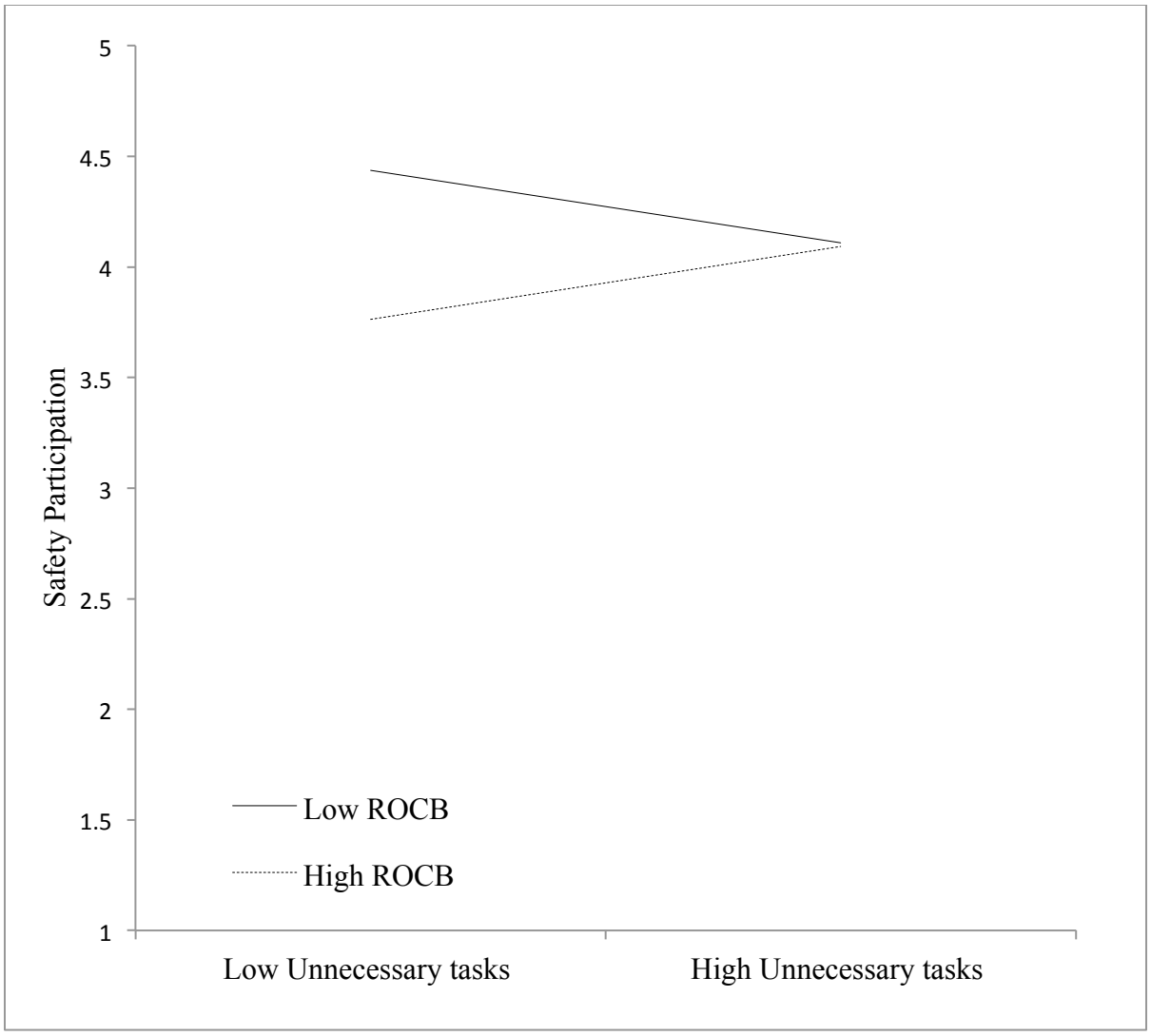

Figure 2. Interaction between unnecessary tasks and reception of OCB in predicting subjects' safety participation behavior

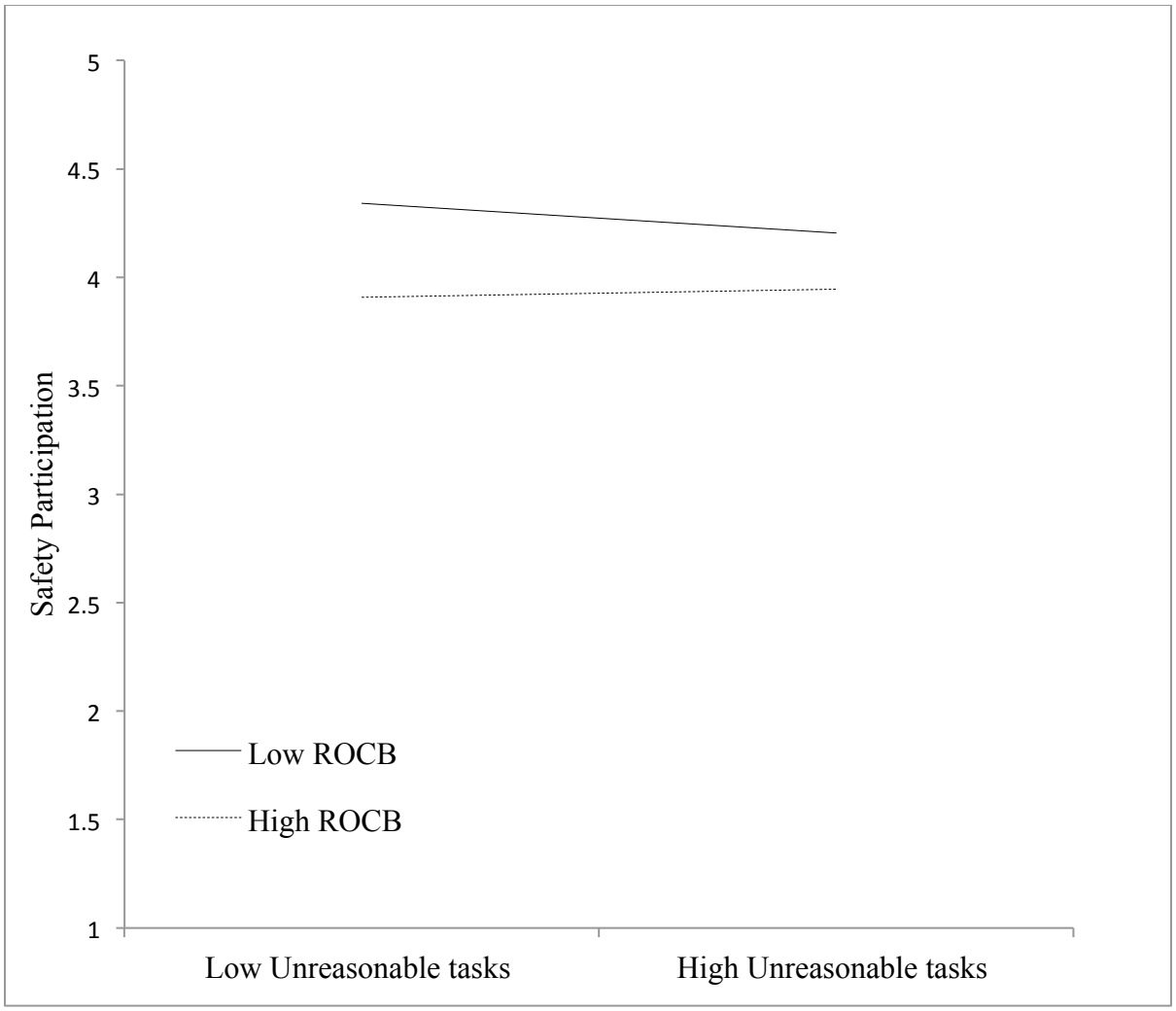

Figure 3. Interaction between unreasonable tasks and reception of OCB in predicting subjects' safety participation behavior

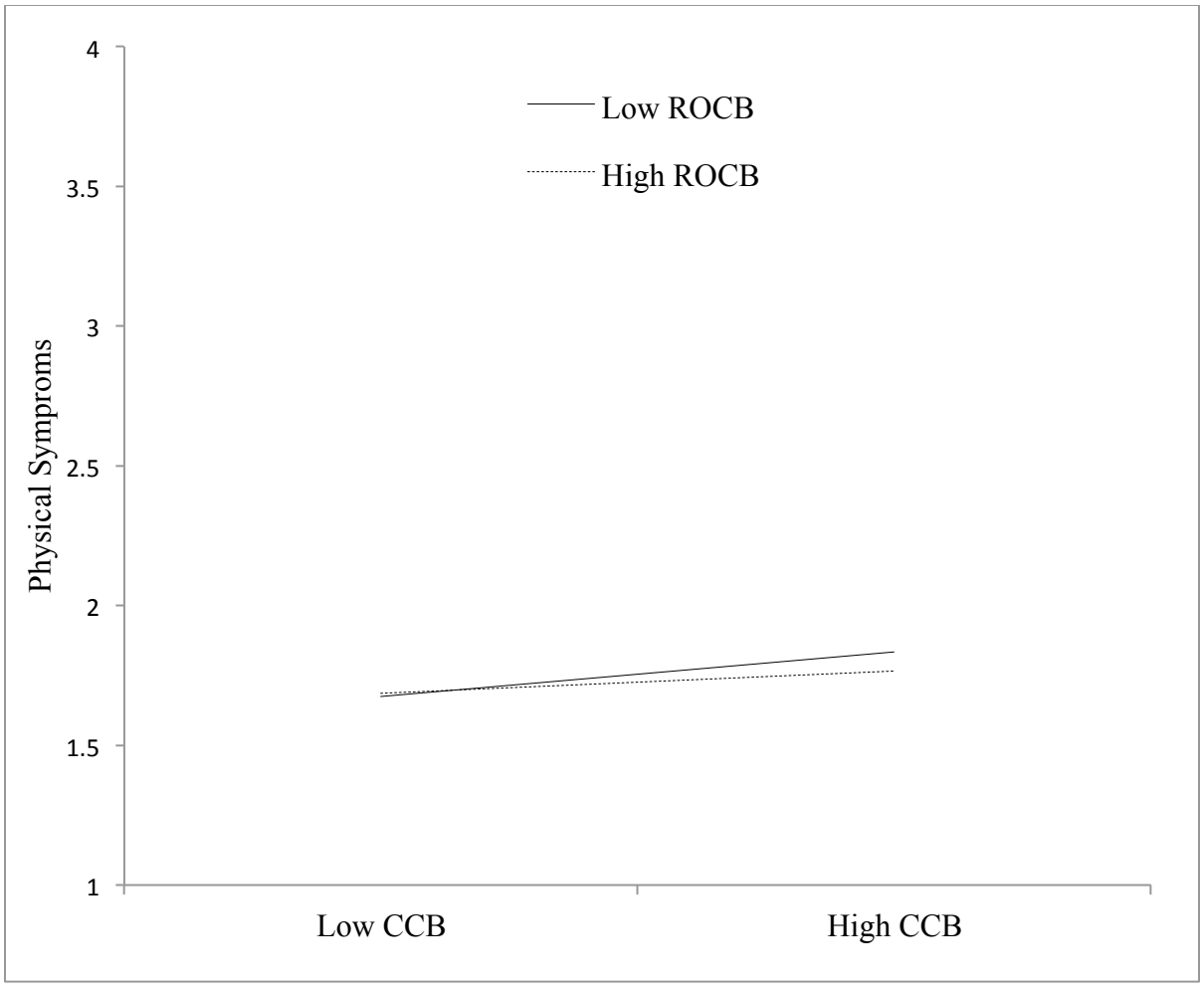

Figure 4. Interaction between participants' compulsory citizenship behavior and reception of OCB in predicting subjects' daily experience of physical symptoms

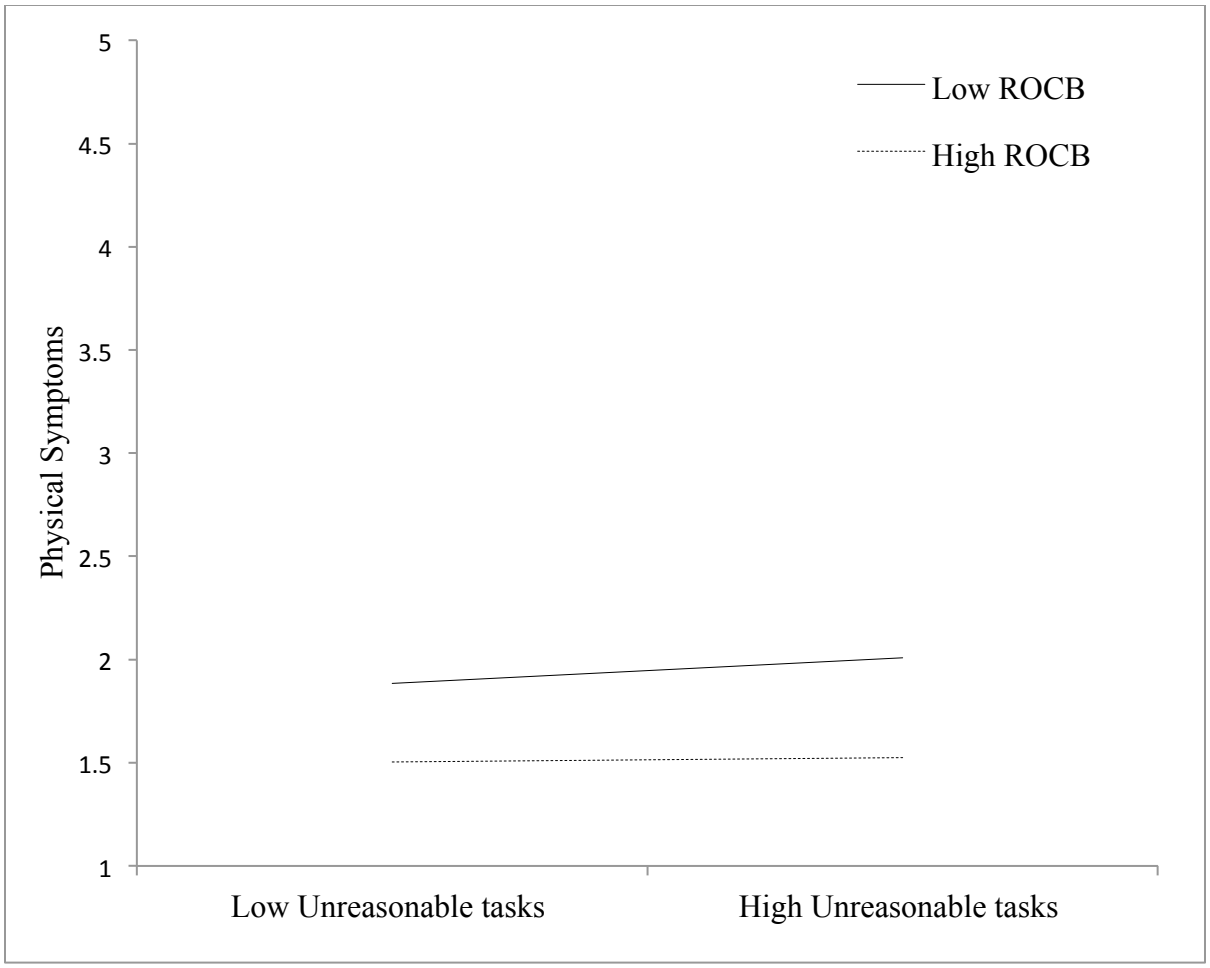

Figure 5. Interaction between unreasonable tasks and reception of OCB in predicting subjects' daily experience of physical symptoms

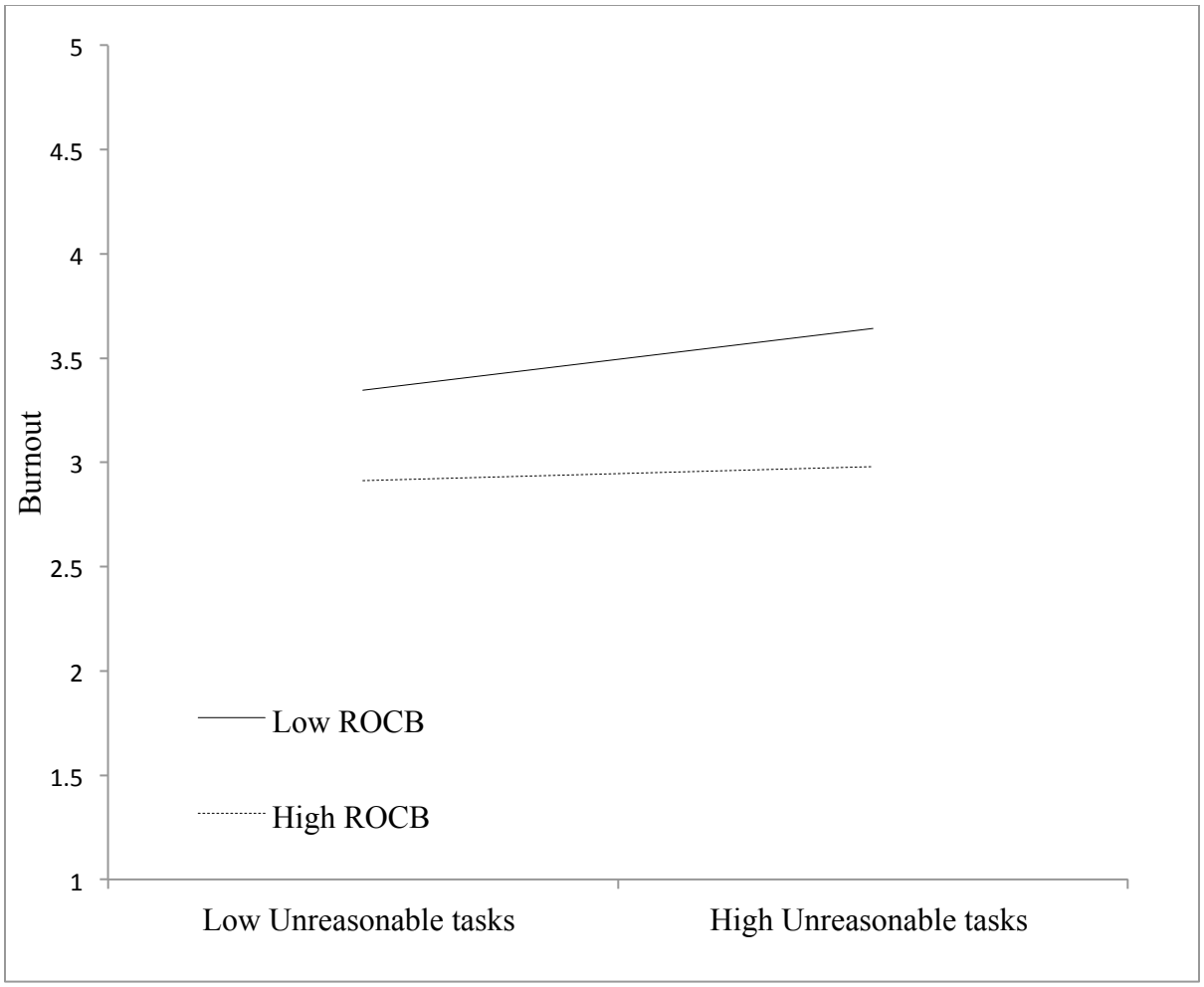

Figure 6. Interaction between unreasonable tasks and reception of OCB in predicting subjects' daily experience of burnout (emotion exhaustion)

REFERENCES

Bakker, A. B., & Demerouti, E. (2007). The job demands resources model: State of the art. *Journal of Managerial Psychology, 22*, 309–328.

Bakker, A.B., Demerouti, E., Taris, T., Schaufeli, W.B. & Schreurs, P. (2003), "A multi-group analysis of the Job Demands-Resources model in four home care organizations", *International Journal of Stress Management, 10*, 16-38.

Berry, C. M., Carpenter, N. C., & Barratt, C. L. (2011). Do other-reports of counterproductive work behavior provide an incremental contribution over self-reports? A meta-analytic comparison. *Journal of Applied Psychology, 97*(3), 613-636. Doi: 10.1037/a0026739.

Björk, L., Bejerot, E., Jacobshagen, N., & Härenstam, A. (2013). I shouldn't have to do this: Illegitimate tasks as a stressor in relation to organizational control and resource deficits. *Work & Stress, 27*(3), 262-277. Doi: 10.1080/02678373.2013.818291.

Borman, W. C, & Motowidlo, S J. (1993). Expanding the criterion domain to include elements of contextual performance, In N. Schmitt & W. Borman (Eds.), *Personnel selection in organizations* (pp. 71-98). San Francisco, CA: Jossey Bass.

Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA US: Sage Publications, Inc..

Cammann, C., Fichman, M., Jenkins, D., & Klesh, J. (1979). The Michigan Organizational Assessment Questionnaire. Unpublished manuscript, University of Michigan, Ann Arbor. University of Michigan, Ann Arbor.

Campbell, J. P., McCloy, R. A., Oppler, S. H., & Sager, C. E. (1993). A theory of performance. In N. Schmitt & W. C.Borman (Eds.), *Personnel selection in organization* (pp. 35-70). San Francisco: Jossey-Bass.

Caplan, R. D., Cobb, S., French, J. R. P., Van Harrison, R., & Penneau, S. R. (1980). *Job demands and worker health*. An Arbor: University of Michigan, Institute for Social Research.

Che, X. X. (2012). An Exploratory Study of Reception of Organizational Citizenship Behaviors and Work Related Outcomes: It is Good for Your Co-workers. Graduate School Theses and Dissertations.

Christian, M. S., Bradley, J. C., Wallace, J., & Burke, M. J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal Of Applied Psychology, 94*(5), 1103-1127.

Clarke, S. (2012). The effect of challenge and hindrance stressors on safety behavior and safety outcomes: A meta-analysis. *Journal Of Occupational Health Psychology, 17*(4), 387-397.

Clarke, S. (2013). Safety leadership: A meta-analytic review of transformational and transactional leadership styles as antecedents of safety behaviours. *Journal Of Occupational And Organizational Psychology, 86*(1), 22-49.

Cooper, M. D., & Phillips, R. A. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal Of Safety Research, 35*(5), 497-512. Doi:10.1016/j.jsr.2004.08.004

Dalal, R. S. (2005). A Meta-Analysis of the Relationship Between Organizational Citizenship Behavior and Counterproductive Work Behavior. *Journal Of Applied Psychology, 90*(6), 1241-1255. Doi:10.1037/0021-9010.90.6.1241.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied psychology*, *86*(3), 499.

Demerouti, E., Mostert, K., & Bakker, A. B. (2010). Burnout and work engagement: A thorough investigation of the independency of both constructs. *Journal of Occupational Health Psychology, 15*, 209-222.

Fox, S., Spector, P. E., & Miles, D. (2001). Counterproductive work behavior (CWB) in response to job stressors and organizational justice: Some mediator and moderator tests for autonomy and emotions. *Journal of Vocational Behavior, 59*(3), 291-309. Doi: 10.1006/jvbe.2001.1803.

Frone, M. R. (2000). Interpersonal conflict at work and psychological outcomes: Testing a model among young workers. *Journal of Occupational Health Psychology, 5*(2), 246-255. Doi: http://dx.doi.org/10.1037/1076-8998.5.2.246.

Gagne´, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior, 26*, 331–326.

Girardi, D., Falco, A., Dal Corso, L., Kravina, L., & De Carlo, A. (2011). Interpersonal conflict and perceived work stress: The role of negative affectivity. *TPM-Testing, Psychometrics, Methodology In Applied Psychology*, *18*(4), 257-273.

Griffin, M. A., & Hu, X. (2013). How leaders differentially motivate safety compliance and safety participation: The role of monitoring, inspiring, and learning. *Safety Science, 60,* 196-202.

Griffin, M. A., & Neal, A. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation. *Journal Of Occupational Health Psychology, 5*(3), 347-358.

Haines, V. A., Hurlbert, J. S. & Zimmer, C. (1991), Occupational stress, social support, and the buffer hypothesis. *Work and Occupations, 18*, 212-35.

Hershcovis, S., Turner, N., Barling, J., Arnold, K. A., Dupré, K. E., Inness, M. & Sivanathan, N. (2007). Predicting workplace aggression: A meta-analysis. *Journal of Applied Psychology, 92*(1), 228-238.

Hoffman, B. J., Blair, C. A., Meriac, J. P., & Woehr, D. J. (2007). Expanding the criterion domain? A quantitative review of the OCB literature. *Journal Of Applied Psychology*, *92*(2), 555-566. doi:10.1037/0021-9010.92.2.555

Hofmann, D. A., Jacobs, R. R., & Landy, F. (1995). High reliability process industries: Individual, micro, and macro organizational influences on safety performance. *Journal Of Safety Research, 26*(3), 131-149. Doi:10.1016/0022-4375(95)00011-E.

Hofmann, D. A., & Morgeson, F. P. (1999). Safety-related behavior as a social exchange: The role of perceived organizational support and leader–member exchange. *Journal Of Applied Psychology, 84*(2), 286-296. Doi:10.1037/0021-9010.84.2.286.

Hofmann, D. A., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. *Personnel Psychology, 49*(2), 307-339. Doi:10.1111/j.1744-6570.1996.tb01802.x.

Hofmann, D. A., & Stetzer, A. (1998). The role of safety climate and communication in accident interpretation: Implications for learning from negative events. *Academy of Management*

Hofmann, D. A., Morgeson, F. P., & Gerras, S. J. (2003). Climate as a moderator of the relationship between leader-member exchange and content specific citizenship: safety climate as an exemplar. *Journal of Applied Psychology, 88*(1), 170.

House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science, 241*(4865), 540-545.

Karasek Jr, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative science quarterly*, 285-308.

Kark, R., Shamir, B., & Chen, G. (2003). The two faces of transformational leadership: Empowerment and dependency. *Journal Of Applied Psychology, 88*(2), 246-255. Doi:10.1037/0021-9010.88.2.246.

Kidd, P., Scharf, T., & Veazie, M. (1996). Linking stress and injury in the farming environment: A secondary analysis of qualitative data. *Health Education Quarterly, 23*(2), 224-237. Doi:10.1177/109019819602300207.

Kottwitz, M. U., Meier, L. L., Jacobshagen, N., Kälin, W., Elfering, A., Hennig, J., & Semmer, N. K. (2013). Illegitimate tasks associated with higher cortisol levels among male employees when subjective health is relatively low: An intra-individual analysis. *Scandinavian Journal of Work, Environment & Health, 39*(3), 310-318. Doi: 10.5271/sjweh.3334.

Lazarus, R. S. (1990). Theory-based stress measurement. *Psychological inquiry, 1*(1), 3-13.

Lepine, J. A., Podsakoff, N. P., & Lepine, M. A. (2005). A meta-analytic test of the challenge stressor-hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal, 48*(5), 764-775. Doi: 10.5465/amj.2005.18803921.

Li, F., Jiang, L., Yao, X., & Li, Y. (2013). Job demands, job resources and safety outcomes: The roles of emotional exhaustion and safety compliance. *Accident Analysis And Prevention, 51*, 243-251.

Lifron, R.J. (1961). *Thought reform and the psychology of totalism*. New York: Norton.

Liu, Y., Wang, M., Chang, C., Shi, J., Zhou, L., & Shao, R. (2015). Work–family conflict, emotional exhaustion, and displaced aggression toward others: The moderating roles of workplace interpersonal conflict and perceived managerial family support. *Journal Of Applied Psychology*, *100*(3), 793-808. doi:10.1037/a0038387

Meyer, J. P., Allen, N. J., & Smith, C. A. (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *Journal of Applied Psychology, 78*, 538-551.

Morrison, E. W. (1994). Role definition and organizational citizenship behavior: The importance of the employee's perspective. *Academy of Management Journal, 37*, 1543–1567.

Mullen, J., Kelloway, E., & Teed, M. (2011). Inconsistent style of leadership as a predictor of safety 99ehavior. *Work & Stress, 25*(1), 41-54.

Muthén, L. K., & Muthén, B. O. (2010). *Mplus user's guide (6th ed)*. Los Angeles, CA: Muthén & Muthén.

Nahrgang, J. D., Morgeson, F. P., & Hofmann, D. A. (2011). Safety at work: a meta-analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. *Journal of Applied Psychology*, *96*(1), 71.

Neal, A. A., Griffin, M. A., & Hart, P. M. (2000). The impact of organizational climate on safety climate and individual behavior. *Safety Science, 34*(1-3), 99-109.

Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal Of Applied Psychology, 91*(4), 946-953.

Nixon, A. E., Mazzola, J. J., Bauer, J., Krueger, J. R., & Spector, P. E. (2011). Can work make you sick? A meta-analysis of the relationships between job stressors and physical symptoms. *Work & Stress, 25*(1), 1-22. Doi: 10.1080/02678373.2011.569175.

Ofshe, R., & Singer, M. T. (1986). Attacks on peripheral versus central elements of self and the impact of thought reforming techniques. *Cultic Studies Journal, 3*(1), 3-24.

Organ, D. W. (1988a). *Organizational citizenship behavior: The good soldier syndrome.* Lexington, MA: Lexington Books.

Organ, D. W., & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology, 48*, 775–802.

Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *The Leadership Quarterly, 1*, 107–142.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879–903. http://dx.doi.org/10.1037/0021-9010.88.5.879

Riketta, M. (2008). The causal relation between job attitudes and performance: A meta-analysis of panel studies. *Journal Of Applied Psychology, 93*(2), 472-481. Doi:10.1037/0021-9010.93.2.472.

Rizzo, J., House, R. J., & Lirtzman, S. I. (1970). Role conflict and role ambiguity in complex organizations. *Administrative Science Quarterly, 15*, 150-163.

Schaufeli, W. B., & Taris, T. W. (2014). A critical review of the Job Demands-Resources Model: Implications for improving work and health. *In Bridging occupational, organizational and public health (pp. 43-68)*. Springer Netherlands.

Schein, E. H., Schneier, I., & Barker, C. H. (1961). *Coercive persuasion.* New York, NY US: W W Norton & Co..

Schermbaum, C. A., & Fetterer, J. M. (2009). Estimating statistical power and required sample sizes for organizational research using multilevel modeling. *Organizational Research Methods, 12*(2), 347-367.

Schmidt, S. (2014). "Uncertainty in the workplace: Examining role ambiguity and role conflict, and their link to depression—a meta-analysis". *European Journal of Work and Oganizational Psychology*, 23 (1), **DOI:** 10.1080/1359432X.2012.711523

Schneider, B. (1990). *Organizational climate and culture.* Pfeiffer.

Semmer, N., Jacobshagen, N., Meier, L., & Elfering, A. (2013*). Illegitimate tasks as a source of stress*. Manuscript submitted for publication.

Semmer, N. K., Jacobshagen, N., Meier, L. L., Elfering, A., Beehr, T. A., Kälin, W., & Tschan, F. (2015). Illegitimate tasks as a source of work stress. *Work & Stress*, *29*(1), 32-56. doi:10.1080/02678373.2014.1003996

Semmer, N. K., Tschan, F., Meier, L. L., Facchin, S., & Jacobshagen, N. (2010). Illegitimate tasks and counterproductive work behavior. *Applied Psychology: An International Review, 59*(1), 70-96. Doi: 10.1111/j.1464-0597.2009.00416.x.

Skogstad, A., Hetland, J., Glasø, L., & Einarsen, S. (2014). Is avoidant leadership a root cause of subordinate stress? Longitudinal relationships between laissez-faire leadership and role ambiguity. *Work & Stress, 28*(4), 323-341. doi: 10.1080/02678373.2014.957362

Snijders, T. A., Steglich, C. E., & Schweinberger, M. (2007). Modeling the co-evolution of networks and behavior. *Longitudinal models in the behavioral and related sciences,* 41-71.

Spector, P. E., & Bruk-Lee, V. (2008). Conflict, health, and well-being. In C. K. W. De Dreu & M. J. Gelfand (Eds.), *The psychology of conflict and conflict management in organizations* (pp. 267-288). New York, NY: Taylor & Francis Group/Lawrence Erlbaum Associates.

Spector, P. E., Bauer, J. A., & Fox, S. (2010). Measurement artifacts in the assessment of counterproductive work behavior and organizational citizenship behavior: Do we know what we think we know?. *Journal Of Applied Psychology, 95*(4), 781-790. Doi:10.1037/a0019477.

Spector, P. E., & Goh, A. (2001). The role of emotions in the occupational stress process. In P. L. Perrewé, D. C. Ganster, P. L. Perrewé, D. C. Ganster (Eds.) , *Exploring theoretical mechanisms and perspectives* (pp. 195-232). US: Elsevier Science/JAI Press. doi:10.1016/S1479-3555(01)01013-7

Spector, P. E., & Jex, S. (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*, 356-367.

Stocker, D., Jacobshagen, N., Semmer, N. K., & Annen, H. (2010). Appreciation at work in the Swiss armed forces. *Swiss Journal of Psychology, 69*(2), 117-124.

Tepper, B. J. (2000). Consequences of abusive supervision. *Academy of Management Journal, 43*, 178-190.

United States National Institute of Occupational Safety and Health (2011). *Work Place Safety and Health Topics: Traumatic Occuptional Injuries.* Retrieved from http://www.cdc.gov/niosh/injury/.

Vigoda-Gadot, E. (2006). Compulsory Citizenship Behavior: Theorizing Some Dark Sides of the Good Soldier Syndrome in Organizations. *Journal For The Theory Of Social Behaviour,* 36(1), 77-93.

Vigoda-Gadot, E. (2007). Redrawing the boundaries of OCB? An empirical examination of compulsory extra-role behavior in the workplace. *Journal Of Business And Psychology, 21*(3), 377-405.

Weiss, H. M., & Cropanzano, R. (1996). Affective Events Theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. In B. M. Staw, L. L. Cummings, B. M. Staw, L. L. Cummings (Eds.) , *Research in organizational behavior: An annual series of analytical essays and critical reviews, Vol. 18* (pp. 1-74). US: Elsevier Science/JAI Press.

Whitman, D. S., Van Rooy, D. L., & Viswesvaran, C. (2010). Satisfaction, citizenship behaviors, and performance in work units: A meta-analysis of collective construct relations. *Personnel Psychology, 63*(1), 41-81. doi:10.1111/j.1744-6570.2009.01162.x

Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management, 17*(3), 601–617.

Yukl, G. (1998). *Leadership in organisations.* Englewood Cliffs, NJ: Prentice Hall.

Zhao, H., Peng, Z., & Chen, H. (2014). Compulsory citizenship behavior and organizational citizenship behavior: The role of organizational identification and perceived interactional justice. *The Journal Of Psychology: Interdisciplinary And Applied, 148*(2), 177-196. doi:10.1080/00223980.2013.768591

Zhao, H., Peng, Z., Han, Y., Sheard, G., & Hudson, A. (2013). Psychological mechanism linking abusive supervision and compulsory citizenship behavior: A moderated mediation study. *The Journal Of Psychology: Interdisciplinary And Applied, 147*(2), 177-195. Doi:10.1080/00223980.2012.680522.

Zohar, D. (2000). A group-level model of safety climate: Testing the effect of group climate on microaccidents in manufacturing jobs. *Journal of Applied Psychology, 85*, 587 – 596.

Zohar, D., & Luria, G. (2005). A Multilevel Model of Safety Climate: Cross-Level Relationships Between Organization and Group-Level Climates. *Journal Of Applied Psychology, 90*(4), 616-628. Doi:10.1037/0021-9010.90.4.616.

APPENDIX A: HYPHTESE AND PROPOSED ANALYSIS

No.	Hypothesis/ Research Question		Statistics	
1	Scale Psychometrics	Reliability	Item analysis: coefficient alpha	
2		Inter-item correlation	Item analysis	
3		Power	Power analysis	
4		Validity	Factor analysis	
5		Dimensionality	EFA	
6			CFA	
7	H 1a	Compulsory citizenship behavior will be positively related to negative emotions and role stress, and negatively related to job attitude.	Multilevel modeling	The overall model will be tested using SEM. Model fit will be indicated by Chi-Square test, RSMEA and CFI
8	H 1b	Compulsory citizenship behavior will be negatively related to employee well-being.	Multilevel modeling	
9	H 1c	Compulsory citizenship behavior is negatively related to safety compliance and safety participation.	Multilevel modeling	
10	H 1d	Negative emotions, role stress, and job attitude will mediate the relationship between compulsory citizenship behavior and employee well-being.	Multilevel modeling	
11	H 1e	Negative emotions, role stress, and job attitude will mediate the relationship between compulsory citizenship behavior and safety compliance and safety participation.	Multilevel modeling	
12	H 2a	Illegitimate tasks (unnecessary and unreasonable) will be positively related to negative emotions and role stress, and negatively related to job attitude.	Multilevel modeling	
13	H 2b	Illegitimate tasks (unnecessary and unreasonable) will be negatively related to employee well-being.	Multilevel modeling	
14	H 2c	Illegitimate tasks (unnecessary and unreasonable) will be negatively related to safety compliance and safety participation.	Multilevel modeling	
15	H 2d	Negative emotions, role stress, and job attitude will mediate the relationship	Multilevel modeling	

		between illegitimate tasks (unnecessary and unreasonable) and employee well-being.		
16	H 2e	Negative emotions, role stress, and job attitude will mediate the relationship between illegitimate tasks (unnecessary and unreasonable) and safety compliance and safety participation.	Multilevel modeling	
17	H 3a	Interpersonal conflict will be positively related to negative emotions, and negatively related to job attitude.	Multilevel modeling	
18	H 3b	Interpersonal conflict will be negatively related to employee well-being.	Multilevel modeling	
19	H 3c	Interpersonal conflict will be negatively related to safety compliance and safety participation.	Multilevel modeling	
20	H 3d	Negative emotions, and job attitude will mediate the relationship between interpersonal conflict and employee well-being.	Multilevel modeling	
21	H 3e	Negative emotions, and job attitude will mediate the relationship between interpersonal conflict and safety compliance and safety participation.	Multilevel modeling	
22	H 4a	Reception of OCB moderates the relationships between compulsory citizenship behavior and safety performance.	Multilevel modeling	
23	H 4b	Reception of OCB moderates the relationships between illegitimate tasks (unnecessary and unreasonable) and safety performance.	Multilevel modeling	
24	H 4c	Reception of OCB moderates the relationships between interpersonal conflict and safety performance.	Multilevel modeling	
25	H 5a	Reception of OCB will moderate the relationships between compulsory citizenship behavior and employee well-being.	Multilevel modeling	
26	H 5b	Reception of OCB will moderate the relationships between illegitimate tasks (unnecessary and unreasonable) and employee well-being.	Multilevel modeling	
27	H 5c	Perceived safety climate will moderate the relationships between interpersonal conflict and safety performance.	Multilevel modeling	

28	H 6a	Perceived safety climate will moderate the relationships between compulsory citizenship behavior and safety performance.	Multilevel modeling	
28	H 6b	Perceived safety climate will moderate the relationships between illegitimate tasks (unnecessary and unreasonable) and safety performance.	Multilevel modeling	
29	H 6c	Perceived safety climate will moderate the relationships between interpersonal conflict and safety performance.	Multilevel modeling	

APPENDIX B: STUDY SURVEY
Baseline survey

Please indicate the following:

Gender (circle one): Male Female

Are you (circle one): Asian Black Hispanic White Other

Age_____

Please indicate your highest level of education:

1. Less than high school
2. High school diploma
3. Some college
4. Associates degree
5. Bachelors degree
6. Some graduate school
7. Masters degree
8. Doctoral level degree

Please indicate how long you have been working at your current job:

_____ Years _____Months

Please indicate how many hours you work at your current job:

_____Hours per week

What unit do you work in? (Please print your answer and do not use abbreviations)

_____

What is your official job title? _____

How often have you seriously considered quitting your present job? : _____

1. Never
2. Rarely
3. Sometimes
4. Somewhat often
5. Quite often
6. Extremely often

After shift diary

At this moment, how do you feel?	Not at all	A little	Somewhat	A good deal	Very much
1. Angry	1	2	3	4	5
2. Aggravated	1	2	3	4	5
3. Irritated or annoyed	1	2	3	4	5
At this moment, how do you feel about your job?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. All in all, I am satisfied with my job	1	2	3	4	5
2. I would be very happy to spend the rest of my career with this organization	1	2	3	4	5
3. This organization has a great deal of personal meaning for me	1	2	3	4	5
During the past shift, how many times each of the event happens?	Never	Once	Twice	Three times	More than 3 times
1. I received an assignment without the manpower to complete it	1	2	3	4	5
2. I knew what my responsibilities were	1	2	3	4	5
3. I received incompatible requests from two or more people	1	2	3	4	5
4. I received an assignment without adequate resources and materials to execute it	1	2	3	4	5
During the past shift, did you experience each of the following symptoms?	Not at all	A little	Some what	A good deal	Very much
1. A backache	1	2	3	4	5
2. Trouble sleeping	1	2	3	4	5
3. Headache	1	2	3	4	5
4. Eye strain	1	2	3	4	5
5. Dizziness	1	2	3	4	5
6. Tiredness or fatigue	1	2	3	4	5
During the past shift, please indicate the degree of your agreement by selecting the number that corresponds with each statement?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I feel emotionally drained	1	2	3	4	5
2. I feel worn out and weary	1	2	3	4	5
3. I feel energized	1	2	3	4	5
During the past shift, how many times did you experience each of the following events?	Never	Once	Twice	Three times	More than 3 times
1. There was social pressure to work extra hours, beyond the formal workload and without any formal rewards.	1	2	3	4	5

2. I was forced to help other nurses beyond my formal obligations.	1	2	3	4	5
3. I was forced to assist my supervisor against my will and beyond my formal job obligations.	1	2	3	4	5
During the past shift, how many times did you have work tasks to take care of, which keep you wondering if…..?	Never	Once	Twice	Three times	More than 3 times
They have to be done at all?	1	2	3	4	5
They would not exist (or could be done with less effort), if things were organized differently?	1	2	3	4	5
During the past shift, how often do you have work tasks to take care of, which you believe…?	Never	Once	Twice	Three times	More than 3 times
Are going too far, and should not be expected from you?	1	2	3	4	5
Should be done by someone else?	1	2	3	4	5
During the past shift, how many times did you experience each of the following events	Never	Once	Twice	Three times	More than 3 times
1. Got into arguments with others at work?	1	2	3	4	5
2. People were rude to you at work?	1	2	3	4	5
3. Other people did nasty things to you at work?	1	2	3	4	5
During the last shift, how many times have any of your co-workers……?	Never	Once	Twice	Three times	More than 3 times
1. Finished something for you when you had to leave early.	1	2	3	4	5
2. Took time to advise, coach, or mentor you.	1	2	3	4	5
3. Took time to listen to your problems and worries	1	2	3	4	5
During the last shift, to what extent do you agree or disagree that each of the following statements is true of you?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I promoted the safety program within the organization	1	2	3	4	5
2. I voluntarily carried out tasks or activities that helped to improve workplace safety.	1	2	3	4	5
3. I used all the necessary safety equipment to do my job.	1	2	3	4	5
4. I ensured the highest levels of safety when I carried out my job.	1	2	3	4	5

Follow-up survey

Top management in this plant–company . . .	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Reacts quickly to solve the problem when told about safety hazards.	1	2	3	4	5
2. Insists on thorough and regular safety audits and inspections.	1	2	3	4	5
3. Tries to continually improve safety levels in each department.	1	2	3	4	5
4. Provides all the equipment needed to do the job safely.	1	2	3	4	5
5. Is strict about working safely when work falls behind schedule.	1	2	3	4	5
6. Quickly corrects any safety hazard (even if it's costly).	1	2	3	4	5
7. Provides detailed safety reports to workers (e.g., injuries, near accidents).	1	2	3	4	5
8. Considers a person's safety behavior when moving–promoting people.	1	2	3	4	5
9. Requires each manager to help improve safety in his–her department.	1	2	3	4	5
10. Invests a lot of time and money in safety training for workers.	1	2	3	4	5
11. Uses any available information to improve existing safety rules.	1	2	3	4	5
12. Listens carefully to workers' ideas about improving safety.	1	2	3	4	5
13. Considers safety when setting production speed and schedules.	1	2	3	4	5
14. Provides workers with a lot of information on safety issues.	1	2	3	4	5
15. Regularly holds safety-awareness events (e.g., presentations, ceremonies).	1	2	3	4	5
16. Gives safety personnel the power they need to do their job.	1	2	3	4	5
During last six months, how often have you experienced each of the following events at work?	Never	Rarely	Sometimes	Frequently	Always
1. Changed vacation schedule, work days, or shifts to accommodate your needs.	1	2	3	4	5
2. Offered suggestions for improving the work environment of yours.	1	2	3	4	5
3. Finished something for you when you had to leave early.	1	2	3	4	5
4. Helped you lift a heavy box or other object.	1	2	3	4	5

5. Took phone messages for you when you are absent or busy.	1	2	3	4	5
6. Said good things about your employer in front of others.	Never	Rarely	Sometimes	Frequently	Always
7. Took time to advise, coach, or mentor you.	1	2	3	4	5
8. Helped you learn new skills or shared job knowledge.	1	2	3	4	5
9. Helped you get oriented to the job.	1	2	3	4	5
10. Offered suggestions to help you improve how work is done.	1	2	3	4	5
11. Lent a compassionate ear when you had a work problem.					
12. Lent a compassionate ear when you had a personal problem.	1	2	3	4	5
13. Took time to listen to your problems and worries	1	2	3	4	5

APPENDIX C: IRB APPROVAL LETTER

USF
UNIVERSITY OF
SOUTH FLORIDA

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX(813)974-7091

October 15, 2013

Xinxuan Che
Psychology
University of South Florida, Psychology Department
4202 East Fowler Ave, PCD 4118G Tampa, FL 33620-7200
Tampa, FL 33620

RE: **Expedited Approval for Initial Review**
IRB#: Pro00014607
Title: Effects of organizational citizenship behaviors on employees' safety compliance

Study Approval Period: 10/15/2013 to 10/15/2014

Dear Ms. Che:

On 10/15/2013, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents outlined below.

Approved Item(s):
Protocol Document(s):
Protocol v1 9.29.13

Consent/Assent Document(s)*:
waiver of ICD form v2 10-01-2013 (footer shows V#1_ 9.30.13)

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s). **Waivers are not stamped.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your study qualifies for a waiver of the requirements for the documentation of informed consent as outlined in the federal regulations at 45CFR46.117(c) which states that an IRB may waive the requirement for the investigator to obtain a signed consent form for some or all subjects.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

John Schinka, Ph.D., Chairperson
USF Institutional Review Board