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Dispositional Mindfulness Moderates the Relationship between Occupational Stressors and Stress Outcomes among Law Enforcement Personnel

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Abstract

Law enforcement personnel (LEPs) experience diverse and substantial stressors (McCraty & Atkinson, 2012; Burke, 1998; Gelderen et al., 2007; Tuckey, Winwood, & Dollard, 2012). These stressors result in significant negative impacts for the personnel themselves (Anshel & Brinthaupt, 2014; Ma et al., 2015; Marmar et al., 2006; Rees & Smith, 2008; Wang et al., 2010) and for society (Arslan, 2010; Rajaratnam et al., 2011; Kligyte, 2013). In order to assess the degree to which these stressors manifest amongst LEPs, biomarkers such as salivary cortisol (Taverniers, Smeets, Ruyssereld, Syroit, & von Grumbkow, 2011) and psychological measures, such as perceived stress (Gershon et al., 2009; Christopher et al., 2015) have been commonly used. Research among the general population shows that dispositional traits such as mindfulness and reactivity to stress moderate the relationship between stressors and stress outcomes (Miller & Chen, 2006; Feizi, Aliyari, & Roohafza, 2012). Additionally, dispositional mindfulness has been shown to negatively predict perceived stress (Zimmaro et al., 2016), mitigate the impact of stressors on negative stress-related outcomes (Chiesa et al., 2012; Marks, Sobanski, & Hine, 2010), and moderate the relationship between stressors and the CAR (Daubenmier, Hayden, Chang, & Epel, 2014). We hypothesize that dispositional mindfulness may be a similarly important protective factor for high-stress occupations such as LEPs.

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DISPOSITIONAL MINDFULNESS MODERATES THE RELATIONSHIP BETWEEN
OCCUPATIONAL STRESSORS AND STRESS OUTCOMES AMONG LAW
ENFORCEMENT PERSONNEL

By

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BA, Lewis & Clark University, 2010

A Thesis submitted to the Faculty of the
School of Professional Psychology, Pacific University,
in partial fulfillment of the requirements for the degree of
Master of Science

2016
This Thesis for the Master of Science degree by

Joshua Benjamin Kaplan

has been approved for the

School of Professional Psychology by

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Michael S. Christopher, PhD

_____________________________________________________
Sarah Bowen, PhD
Kaplan, Joshua Benjamin, BA (MS, Psychology)

Dispositional Mindfulness Moderates the Relationship Between Occupational Stressors and Stress Outcomes Among Law Enforcement Personnel

Thesis directed by Michael S. Christopher, PhD

Law enforcement personnel (LEPs) experience various occupational stressors, which often result in significant negative personal and societal effects. Biomarkers such as salivary cortisol, and psychological measures such as perceived stress, have been used to assess the impact of these stressors on LEPs. Additionally, dispositional mindfulness has been shown to negatively predict perceived stress and to moderate the relationship between stressors and negative stress-related outcomes, such as the cortisol awakening response (CAR). In this study, we investigated whether facets of dispositional mindfulness moderate the relationships between occupational stressors and physiological and psychological stress in a sample of LEPs. As predicted, nonjudging significantly moderated the relationship between organizational stressors and perceived stress and nonreactivity significantly moderated the relationship between operational stressors and perceived stress. Additionally, nonreactivity moderated the relationship between organizational stressors and the CAR; however, the interaction was in the opposite of expected direction. We also found a significant interaction between nonjudging and nonreactivity in the prediction of perceived stress, indicating that perceived stress is highest when both of these facets of mindfulness are low.

Keywords: mindfulness, police, stress, cortisol
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Introduction

Law enforcement personnel (LEPs) experience diverse and substantial stressors (McCraty & Atkinson, 2012; Burke, 1998; Gelderen et al., 2007; Tuckey, Winwood, & Dollard, 2012). These stressors result in significant negative impacts for the personnel themselves (Anshel & Brinthaupt, 2014; Ma et al., 2015; Marmar et al., 2006; Rees & Smith, 2008; Wang et al., 2010) and for society (Arslan, 2010; Rajaratnam et al., 2011; Kligyte, 2013). In order to assess the degree to which these stressors manifest amongst LEPs, biomarkers such as salivary cortisol (Taverniers, Smeets, Ruyssereld, Syroit, & von Grumbkow, 2011) and psychological measures, such as perceived stress (Gershon et al., 2009; Christopher et al., 2015) have been commonly used. Research among the general population shows that dispositional traits such as mindfulness and reactivity to stress moderate the relationship between stressors and stress outcomes (Miller & Chen, 2006; Feizi, Aliyari, & Roohafza, 2012). Additionally, dispositional mindfulness has been shown to negatively predict perceived stress (Zimmaro et al., 2016), mitigate the impact of stressors on negative stress-related outcomes (Chiesa et al., 2012; Marks, Sobanski, & Hine, 2010), and moderate the relationship between stressors and the CAR (Daubenmier, Hayden, Chang, & Epel, 2014). We hypothesize that dispositional mindfulness may be a similarly important protective factor for high-stress occupations such as LEPs.
Literature Review

LEP Stressors

LEPs experience substantial and diverse occupational stressors (McCraty & Atkinson, 2012; Burke, 1998; Gelderen et al., 2007; Tuckey, Winwood, & Dollard, 2012), which are often categorized as operational and organizational. Operational stressors include acute incidents common for LEPs, such as high-speed chases, physical threat, shift work, and negative interactions with the public (McCraty & Atkinson, 2012; Waters & Ussery, 2007). Organizational stressors include internal politics, inequality of professional roles, lack of resources, lack of diverse job-related opportunities (e.g., “stuck in patrol”), and staff shortages (Burke, 1998; Gelderen et al., 2007; Juniper, White, & Bellamy, 2010; Shane, 2010; Tuckey, Winwood, & Dollard, 2012). These organizational sources of stress tend to be chronic, accumulate over time, and may have a more pernicious—yet equally detrimental—impact on LEP health (Hickman, 2011). LEPs impacted by these stressors experience a host of negative outcomes that impair their ability to perform their duties and interact with the community safely and effectively.

Occupational stressors are linked to fatigue (Ma et al., 2015), sleep disruption (Gershon et al., 2009; Rajaratnam et al., 2011), spousal and general relationship issues, burnout, and irritability (Hickman, 2011; Wirth, 2013) among LEPs. Relative to the general population, LEPs experience higher rates of depression (Wang et al., 2010), post-traumatic stress disorder (PTSD; Marmar et al., 2006), alcohol use disorders (Rees & Smith, 2008), suicidal ideation and attempts, chronic anxiety, and ineffective communication (Anshel & Brinthaupt, 2014). Similarly, physical health issues such as cardiovascular disease, metabolic disorders (Ma et al., 2015), cancer (Wirth
et al., 2013), obesity, and poor nutrition (Wyllie, 2011) are also present in LEPs at higher rates than the general population.

In addition to negative health effects of police stressors on LEPs themselves, high-stress LEPs are also at greater risk for poor job-related outcomes, such as administrative and tactical errors, absenteeism, falling asleep while driving, and anger and aggression toward suspects (Rajaratnam et al., 2011). In turn, anger and aggression in LEPs have been shown to negatively impact problem-solving (Arslan, 2010) and ethical decision making (Kligyte, 2013), and is positively related to hostile attribution and inclination to inflict particularly harsh punishment (Ask & Pina, 2011; Seip, 2014). Given the negative effect of occupational stressors on LEP health and job performance, as well as the larger implications for society, an improved understanding of factors that might mitigate the impact of stressors on stress outcomes is needed.

**LEP Stress**

Salivary cortisol has been used as a biomarker of stress and related consequences in previous studies of LEPs. Temporarily heightened cortisol arousal has been related to enhanced quickness at identifying potential targets in a training scenario (Akinola & Mendes, 2012); however, chronically elevated cortisol is related to a higher LEP incidence of metabolic syndrome, cardiovascular problems (Violanti et al., 2009), and truncal obesity (Sharp et al., 2013). Among LEPs, perceived stress also predicts avoidant and negative coping behaviors, depression, anxiety, burnout (Gershon et al., 2009), sleep disturbances (Charles et al., 2011), cortisol (Walvekar, Ambekar, & Devaranavadagi, 2015) and is predicted by shift work (Gerber et al., 2010).

Also among LEPs, several studies have found that general occupational stressors (Inslicht et al., 2011; Walvekar et al., 2015), shift work (Wirth et al., 2013), and traumatic stress (Ouellet-
Morin et al., 2011) are predictive of cortisol and perceived stress. Despite a body of research concluding that chronic, acute, and occupational stressors are related to the CAR and perceived stress among the general public (e.g., Kudielka et al., 2012; Hirvikoski, Lindholm, Nordstrom, & Lajic, 2009; Walker et al., 2011; Gartland, O’Connor, Lawton, & Bristow, 2014; Powell & Schlotz, 2012), other studies have found they are not (Vasunilashorn et al., 2014; Greaves-Lord et al., 2007). Additional studies have found negative affect, anxiety, and rumination do not reliably relate to the CAR (Chida & Steptoe, 2009; Zoccola & Dickerson, 2012). These findings suggest the possibility that other moderating variables may account for the inconsistent relationship between stressors and stress outcomes. Dispositional traits such as reactivity to stress (Miller & Chen, 2006), mental distress, and other health problems (Shah, Hasan, Malik, & Sreeramareddy, 2010) have been shown to impact the relationship between stressors and perceived stress.

**Dispositional mindfulness**

Dispositional mindfulness has been defined as an innate characteristic reflecting an individuals’ natural occurring ability to inhabit an intentional stance of awareness (Brown & Ryan, 2003). Dispositional mindfulness negatively predicts mental health outcomes such as perceived stress (Zimmaro et al., 2016), and has been shown to moderate the relationship between stressors and outcomes such as dysphoria (Chiesa et al., 2012), rumination (Ciesla, Reilly, Dickson, Emanuel, & Updegraff, 2012), and symptoms of depression, anxiety, and stress (Marks, Sobanski, & Hine, 2010). Moreover, nonjudging of inner experience moderates the relationship between neuroticism and suicidal ideation, acting with awareness moderates the relationship between stressful life events and negative depression and anxiety (van Son et al., 2014), and acceptance moderates the relationship between perceived stress and the CAR.
(Daubenmier, Hayden, Chang, & Epel, 2014). Taken together, these studies suggest that facets of dispositional mindfulness may mitigate the impact of stressors on perceived stress and the CAR.

Mindfulness research on LEPs is limited; however, acceptance negatively predicts depression among law enforcement personnel in training (Williams et al., 2010) and PTSD symptoms among active-duty LEPs (Chopko & Schwartz, 2013). Additionally, mindfulness has been shown to reduce occupational stressors and anger amongst LEPs (Bergman, Christopher, & Bowen, 2016). Dispositional mindfulness may buffer the impact of operational and organizational stressors among LEPs. Therefore, the aim of this study is to examine whether three facets of dispositional mindfulness (i.e., acting with awareness, nonreactivity, and nonjudging of inner experience) moderate the relationships between police stressors and the CAR, and police stressors and perceived stress among LEPs, such that when dispositional mindfulness is high, the relationship between stressors and psychological/physiological stress is weaker than when it is low.

**Method**

**Participants**

Participants were recruited from a police department in a medium-sized city in the Pacific Northwestern United States from Spring 2013 to Spring 2014. All eligible personnel in the department were invited to participate in an 8-week Mindfulness-Based Resilience Training course (see Christopher et al., 2016 for details). In this secondary data analysis, we only used baseline data, which resulted in a sample of 72 participants. The sample was 57% male, the average age was 43.53 years (SD = 7.72; range = 24-61), and in terms of race and ethnicity, 58 (81%) were Euro-American; 9 (13%) were Latino/a American; and 5 (6%) identified as Other.
The sample was composed of 48 officers, 10 civilian support staff, 9 sergeants, 3 lieutenants, and 2 other. The average number of years on the force was 13.28 (SD = 5.94; range 2-25).

**Self-Report Measures**

The **Five Facet Mindfulness Questionnaire-Short Form** (FFMQ-SF; Bohlmeijer et al., 2011) is a 24-item measure adapted from the FFMQ (Baer et al., 2006). It was developed using factor analyses of existing questionnaires assessing individuals’ dispositional tendency to be mindful in daily life. The full FFMQ consists of five facets of mindfulness: observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience; we only used the acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience subscales because the describing and observing facets have been found to be relatively less reliable across individuals with differing levels of meditation experience (e.g., Christopher et al., 2012; de Bruin et al., 2012). Each of these facets had five items resulting in a 15-item scale and the internal consistency of the scale in the present sample was good (α = .82).

The **Police Stress Questionnaire** (PSQ; McCreary & Thompson, 2006) is a 40-item questionnaire consisting of two subscales measuring operational stressors (20 job content items) and organizational stressors (20 job context items). For each type of stress, all items were summed to create a total score. The organizational and operational subscales have demonstrated excellent factorial validity and expected correlations with other constructs (Shane, 2010). In the present sample, both operational (α = .85) and organizational (α = .88) factors demonstrated good internal consistency.

The 4-item **Perceived Stress Scale-4** (PSS-4; Cohen & Williamson, 1988) was used to assess the degree to which situations in life are perceived as stressful. Items on the PSS-4 are
designed to capture how unpredictable, uncontrolled, and overloaded participants find their lives. The PSS-4 has demonstrated expected correlations with a variety of constructs (Cohen & Williamson, 1988), and in the present sample demonstrated acceptable internal consistency ($\alpha = .69$).

**Saliva Collection**

Self-collected saliva from participants was collected in 5 ml polypropylene tubes. This method is noninvasive, and can be undertaken at home with minimum interferences with normal daily routines. Participants self-collected approximately 2-3 ml of saliva at 0, 30, and 45 minutes after awakening in the morning. Participants were directed to document their study code number, as well as the date and time they collected each sample directly on a label affixed to each tube. Awakening was either arranged via alarm or spontaneous. Participants were instructed to refrain from eating, drinking (except small amounts of water), smoking, brushing teeth, taking medications, and exercising prior to completing saliva collection. Saliva was then processed and assayed for cortisol with an FDA-approved direct (non-extracted) salivary EIA cortisol kit (Pantex). Cortisol was measured in 25 microliter increments by slight modifications of a previously described method (Du et al., 2013). Inter-assay coefficient of variation for cortisol is 8% at 1ng/ml, 7.1% at 4ng/ml, and 7.6% at 12.9 ng/ml. The detectable limit is 0.1 to 30ng/ml. All cortisol values were converted from ng/ml to nmol/L. In all analyses, we computed the area under the curve with respect to increase ($\text{AUC}_I$). Cortisol levels were transformed into a single value by calculating the $\text{AUC}_I$ for the three collection times (0, 30, and 45 min after awakening).

The regulation of cortisol in humans follows a strong circadian rhythm – levels are highest in the morning after awakening, and decline throughout the day with the nadir around
midnight, to rise again in the early morning hours (Matousek, Proussner, & Dobkin, 2011). A distinct characteristic of the HPA axis is the cortisol awakening response (CAR). The CAR, reflecting the organism’s response to the natural stressor of awakening, is a discrete part of the cortisol circadian cycle. In healthy individuals, it is characterized by a sharp rise (between 50 and 75%) of cortisol levels within the first 30 minutes after awakening (Clow, Hucklebridge, & Thorn, 2010). Repeated measurement of free cortisol levels within the 60 minutes after awakening in the morning is considered a stable and reliable biological marker of adrenocortical activity (Preussner et al., 1997). Salivary cortisol was only collected from a portion of participants; therefore, the sample size for all cortisol analyses is 48.

**Design and Analyses**

To investigate if dispositional mindfulness moderates the relationship between police stressors and physiological/psychological stress, PROCESS (Hayes, 2012) for SPSS Statistics (v. 22) was used. The interaction between each independent variable (operational stress and organizational stress) and moderator variable (nonreactivity, nonjudging, and act with awareness) was examined separately for each dependent variable (CAR and perceived stress) for a total of 12 regression analyses. For each model, either organizational or operational stress was entered in Step 1, either act with awareness, nonjudging of inner experience, or nonreactivity to inner experience was entered in Step 2; and the interaction term between these two variables was entered in Step 3. A p value of .05 was retained for significance testing despite multiple analytic models due to small sample size and the exploratory nature and novel population in the study.

**Results**

**Preliminary analyses**
Prior to data analyses, all variables were examined using SPSS-23 (SPSS Inc., 2013) to examine univariate and multivariate data assumptions. Although there were no univariate outliers, two multivariate outliers identified using Mahalanobis Distance, and both cases were excluded from the analysis. Data obtained from the second cortisol collection time point (i.e., 30 minutes after waking) was substantially skewed (1.158), and transformed via square root prior to the calculation of the AUCI. Descriptive statistics and correlations between study variables are in Table 1.

**Regression Models**

As shown in Tables 2 and 3, three of the twelve interactions tested were found to be statistically significant. First, nonreactivity moderated the relationship between operational stressors and perceived stress ($p = .01$). As predicted, simple slope analyses revealed that when nonreactivity is high (+1 SD), the relationship between operational stressors and perceived stress is non-significant, whereas this relationship is statistically significant at average (Mean; $p = .004$) and low (-1 SD; $p < .001$) levels of nonreactivity (see Figure 1). Second, nonjudging moderated the relationship between organizational stressors and perceived stress ($p = .04$). Unexpectedly, simple slope analyses revealed that when nonjudging was low (-1 SD), the relationship between organizational stressors and perceived stress was non-significant, whereas it was significant at average (Mean; $p = .003$) and high (+1 SD; $p < .001$) levels of nonjudging. However, although the simple slope analysis revealed that organizational stressors predicted perceived stress at only average and high levels of nonjudging, those who were low in nonjudging endorsed higher levels of perceived stress at all levels of organizational stress, which partially explains the interaction, and is consistent with prediction (see Figure 2). Third, nonreactivity moderated the relationship between organizational stressors and the CAR ($p = .03$). Simple slope analyses revealed that the
relationship between organizational stressors and the CAR was significant only at very low (-3 SD; \(p = .05\)) levels of nonreactivity (see Figure 3).

**Post-hoc analyses**

Given that the relationship between operational stressors and perceived stress was non-significant when nonjudging is low (-1 SD) and when nonreactivity is high (+1 SD), we tested the interaction between these facets in predicting perceived stress in order to examine their synergistic impact (see Table 4). Both of these facets were entered in Step 1, and nonjudging \((\beta = -.46, p < .001)\) and nonreactivity \((\beta = -.31, p = .008)\) were both found to significantly negatively predict perceived stress. In Step 2, the interaction between nonjudging and nonreactivity was entered, which was a significant predictor of perceived stress \((\beta = 1.72, p = .013)\). Simple slopes were plotted for each combination of the moderation (see Figures 4 and 5), which revealed that when either nonreactivity or nonjudging were low (-1 SD), the relationship between the other facet and perceived stress was significant. However, when either nonreactivity or nonjudging were high (+1 SD), the relationship between the other facet and perceived stress was not significant.
Table 1.

**Means, standard deviations, and correlations for study variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
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<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td>2. Nonjudging</td>
<td>16.94</td>
<td>3.66</td>
<td>.414**</td>
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<tr>
<td>3. Act with Awareness</td>
<td>14.36</td>
<td>3.29</td>
<td>.116</td>
<td>.258*</td>
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<td>4. CAR</td>
<td>69.29</td>
<td>17.94</td>
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<td>.309*</td>
<td>.217</td>
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<td>5. PSQ-Org</td>
<td>62.80</td>
<td>18.29</td>
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<td>-.168</td>
<td>-.218</td>
<td>.000</td>
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<td>6. PSQ-Op</td>
<td>9.80</td>
<td>2.78</td>
<td>-.063</td>
<td>-.172</td>
<td>-.129</td>
<td>.012</td>
<td>.504**</td>
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<td>7. PSS</td>
<td>18.39</td>
<td>41.32</td>
<td>-.313**</td>
<td>-.458**</td>
<td>-.482**</td>
<td>-.070</td>
<td>.364**</td>
<td>.356**</td>
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</tbody>
</table>

Note: Nonreactivity = Nonreactivity facet of Five Facet Mindfulness Questionnaire, Nonjudging = Nonjudging facet of Five Facet Mindfulness Questionnaire, Act with awareness = Act with awareness facet of Five Facet Mindfulness Questionnaire, PSQ Org = Police Stress Questionnaire: Organizational subscale, PSQ Op = Police Stress Questionnaire: Operational subscale, CAR = cortisol awakening response, PSS = Perceived Stress Scale

*p < .05, **p < .001
Table 2.

Results of regression models testing interactions between facets of dispositional mindfulness and police stressors on perceived stress

<table>
<thead>
<tr>
<th>Perceived stress</th>
<th>$\Delta R^2$</th>
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<td>Step 1</td>
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<td>.018</td>
<td>.06</td>
<td>.002</td>
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<td>PSQ Organizational</td>
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</tr>
<tr>
<td>Step 2</td>
<td>.28</td>
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<td>.016</td>
<td>.04</td>
<td>.012</td>
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<tr>
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<td></td>
<td>Act with awareness</td>
<td>-.42</td>
<td>.088</td>
<td>-.36</td>
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<td>Act with awareness</td>
<td>-.88</td>
<td>.301</td>
<td>-.74</td>
<td>.016</td>
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<tr>
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<td>.004</td>
<td>.006</td>
<td>.18</td>
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<tr>
<td>Step 1</td>
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<td>.36</td>
<td>.018</td>
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<tr>
<td>Step 2</td>
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<td>.30</td>
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<tr>
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<td></td>
<td>Nonjudgment</td>
<td>-.41</td>
<td>.079</td>
<td>-.31</td>
<td>&lt; .001</td>
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<tr>
<td>Step 3</td>
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<td>-.66</td>
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<td>PSQ Org x NJ</td>
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<td>Model 3</td>
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<td>Step 1</td>
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Note: PSQ Organizational = Police Stress Questionnaire: Organizational subscale, PSQ Operational = Police Stress Questionnaire: Operational subscale, AWA = Act with awareness facet of Five Facet Mindfulness Questionnaire, NJ = Nonjudging facet of Five Facet Mindfulness Questionnaire, NR = Nonreactivity facet of Five Facet Mindfulness Questionnaire.
Table 3

Results of regression models testing interactions between facets of dispositional mindfulness and police stressors on cortisol awakening response

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Note: PSQ Organizational = Police Stress Questionnaire: Organizational subscale, PSQ Operational = Police Stress Questionnaire: Operational subscale, AWA = Act with awareness facet of Five Facet Mindfulness Questionnaire, NJ = Nonjudging facet of Five Facet Mindfulness Questionnaire, NR = Nonreactivity facet of Five Facet Mindfulness Questionnaire
Table 4.

Results of regression models testing interactions between Nonjudging and Nonreactivity on perceived stress

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Note: NJ = Nonjudging facet of Five Facet Mindfulness Questionnaire, NR = Nonreactivity facet of Five Facet Mindfulness Questionnaire
Figure 1.

*Police Stress Questionnaire: Operational subscale and Nonreactivity*

Note: PSS = Perceived Stress Scale, PSQ-OP = Police Stress Questionnaire: Operational subscale, FFMQ = Five Facet Mindfulness Questionnaire
Figure 2.

*Police Stress Questionnaire: Organizational subscales and Nonjudging*

Note: PSS = Perceived Stress Scale, PSQ-Org = Police Stress Questionnaire: Organizational subscale, FFMQ = Five Facet Mindfulness Questionnaire
Figure 3.

*Police Stress Questionnaire: Organizational subscale and the CAR*

Note: CAR = Cortisol awakening response, PSQ-Org = Police Stress Questionnaire: Organizational subscale, FFMQ = Five Facet Mindfulness Questionnaire, Nonreactivity = Nonreactivity facet of Five Facet Mindfulness Questionnaire
Figure 4.

*Nonjudging and Nonreactivity*

Note: PSS = Perceived Stress Scale, FFMQ = Five Facet Mindfulness Questionnaire, Nonjudging = Nonjudging facet of Five Facet Mindfulness Questionnaire, Nonreactivity = Nonreactivity facet of Five Facet Mindfulness Questionnaire.
Figure 5.

*Nonreactivity and nonjudging*

Note: PSS = Perceived Stress Scale, FFMQ = Five Facet Mindfulness Questionnaire, Nonjudging = Nonjudging facet of Five Facet Mindfulness Questionnaire, Nonreactivity = Nonreactivity facet of Five Facet Mindfulness Questionnaire
Discussion

The goal of this study was to examine the role of dispositional mindfulness in mitigating the impact of occupational stressors on stress outcomes among LEPs. We hypothesized that when dispositional mindfulness is high, the relationship between stressors and psychological/physiological stress would be weaker than when it is low. To our knowledge this is the first study to explore the potential protective nature of dispositional mindfulness in an LEP sample. Results suggest that both nonjudging and nonreactivity are significant moderators of the relationship between occupational stressors and stress outcomes.

Perceived Stress

As expected, operational and organizational stressors and all three facets of mindfulness (nonjudging, nonreactivity, and acting with awareness) independently and significantly predicted perceived stress. Moreover, as predicted, several interactions between a mindfulness facet and a domain of police stressor were statistically significant. Specifically, we found that at low levels of nonreactivity, the relationship between operational stressors and perceived stress was significant, but at higher levels of nonreactivity the relationship was non-significant. This finding is consistent with research that has shown occupational stressors experienced by LEPs are reliably related to perceived stress (Inslicht et al., 2011; Walvekar et al., 2015; Wirth et al., 2013), and that dispositional traits, such as reactivity to stress, moderate this relationship (Miller & Chen, 2006). These results have been replicated in the general population as well; nonreactivity is an important mitigating trait for severe stress outcomes such as overall PTSD symptomology (Kalill, Treanor, & Roemer, 2014). Furthermore, our findings align with previous research, demonstrating that mindfulness negatively predicts both occupational stressors and
stress-related outcomes in LEPs (Bergman et al., 2016). Building on limited extant research, our findings suggest that nonreactivity may be an important dispositional trait that helps mitigate the impact of occupational stressors on LEPs.

Similarly, nonjudging moderated the relationship between organizational stressors and perceived stress; however, unexpectedly, the relationship between organizational stressors and perceived stress was significant at average and higher levels of nonjudging, and not lower levels, as we had predicted. However, closer inspection of the simple slope analysis revealed that those who were low in nonjudging endorsed higher levels of perceived stress at all levels of organizational stress, whereas those who were high in nonjudging endorsed much lower levels of perceived stress when organizational stress was low. These findings suggest that nonjudging may indeed confer some protective benefits at lower levels of stressors. This interaction may also be partially explained by the nature of LEP training. LEPs are trained to make rapid judgments in various situations pertinent to their occupation (Storey, Gibas, Reeves, & Hart, 2011), a tendency that has been shown to be helpful in many crucial aspects of their work (Vrij et al., 2007; Reynolds & Miles, 2009; McNiel et al., 2008).

**Cortisol Awakening Response**

Unlike perceived stress, neither organizational nor operational police stressors were predictive of CAR. Similarly, only the nonjudging facet of mindfulness predicted CAR, and nonreactivity was the only significant moderator (of organizational stressors and CAR). Unexpectedly, at low levels of nonreactivity, there was a significant negative relationship between organizational stressor and CAR, whereas at higher levels of nonreactivity, the relationship between organizational stressors and CAR was positive and statistically significant. This finding is counterintuitive, as past research has shown that dispositional mindfulness is
negatively related to salivary cortisol (Daubenmier, 2014; Garland, Beck, Lipschitz, & Nakamura, 2015; Taren et al., 2013; Way et al., 2010). However, other studies have failed to demonstrate such a link, which suggests that salivary cortisol may be an unreliable indicator of stress response (Chida & Steptoe, 2009; Zoccola & Dickerson, 2012). This inconsistency may be partially attributable to several factors. First, cortisol is influenced by traumatic and stressful experiences (Ouellet-Morin et al., 2011), and LEPs who experience chronic stress may exhibit a blunted cortisol response (Galatzer-Levy et al., 2014). Second, and specific to this study, although we adhered to the standard protocol of acquiring three cortisol collection times within 60 minutes after waking, we relied on a single day of testing, whereas multiple days of testing is preferable, given the day-to-day variability in cortisol production (Matousek et al., 2010).

**Nonjudging and Nonreactivity**

In a post-hoc analysis, we found that nonjudging and nonreactivity interacted to confer additional protective factors against stress, over and beyond the other alone. More specifically, lower levels of both nonjudging and nonreactivity were related to higher levels of perceived stress, and higher levels of both nonjudging and nonreactivity were related to lower levels of perceived stress. This finding may indicate that these facets of mindfulness have a synergistic impact on perceived stress. These two facets of mindfulness have been suggested to be particularly important, and may be conceptualized as a type of acceptance (Baer, 2006). In the present sample, nonjudging and nonreactivity may interact to help LEPs approach thoughts, feelings, and experiences with acceptance, and therefore perceive events as being less stressful. Similarly, in separate MBI studies, improvements in nonreactivity and nonjudging both predicted depression symptoms in veterans (Colgan, Christopher, Michael, & Wahbeh, 2016), and improved nonjudging predicted stress and anger outcomes amongst law enforcement officers.
(Bergman et al., 2016). Relatedly, when investigating the facets of the FFMQ, Peters, Eisenlohr-Moul, Upton, and Baer (2013) found that nonjudging and acting with awareness had synergistic effects in predicting impulsivity and anger (Peters, Eisenlohr-Moul, Upton, & Baer, 2013). These findings suggest that it may be helpful to examine the relationship between facets of mindfulness in predicting outcomes, and that combinations of these facets may describe semi-unique constructs.

**Limitations**

This study has several limitations that should be considered when interpreting and generalizing results. First, as noted above, our use of a single-day saliva collection may have limited our ability to detect and interpret CAR-related findings. Additionally, the small sample size, particularly for cortisol data ($n = 48$) may have resulted in limited power, and reduced our ability to detect significant moderations. Also, as mentioned previously, exposure to trauma may result in a blunted CAR (Matousek et al., 2011). Given the often-traumatic nature of police work, and the similarity between our baseline cortisol data and the data provided in a sample of breast cancer patients (Matousek et al., 2011), it is likely that our sample may have also had a blunted CAR. Second, several measures (i.e., PSS-4, PSQ) had acceptable, but not excellent internal consistency. Third, cross-sectional data from a single police department limits generalizability.

**Conclusion**

Despite these limitations, we believe this finding may have important implications. LEPs face unique and substantial stressors throughout their careers. The current study suggests that several facets of mindfulness may protect against the impact of occupational stressors for this population, despite the severity and urgency of the stressors they face. While this study
contributes to this growing body of literature, mechanisms by which mindfulness interventions may serve to mitigate negative health outcomes among LEPs and other first responders has yet to be systematically studied. A potential mechanism might be enhanced resilience, or the ability to make a rapid recovery from psychological distress (Bao, Xue, & Kong, 2015). A number of studies of mindfulness-based interventions have shown that resilience mediates the relationship between mindfulness and positive health outcomes among college students (Bajaj & Pande, 2016), the general population (Nitzan-Assayag, Aderka, & Bernstein, 2015), and first responders (Kaplan et al., 2016). While these promising preliminary findings need further study, they offer an exciting possibility for improving first responder health, and subsequently improving the well-being of the communities they serve.
References


pharmacotherapy for chronic primary insomnia: A randomized controlled clinical trial.


McNiel, D. E., Chamberlain, J. R., Weaver, C. M., Hall, S. E., Fordwood, S. R., & Binder, R. L.


Appendix A
Five Facet Mindfulness Questionnaire

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>never or very rarely true</td>
<td>rarely true</td>
<td>sometimes true</td>
<td>often true</td>
<td>very often or always true</td>
</tr>
</tbody>
</table>

1. When I’m walking, I deliberately notice the sensations of my body moving.
2. I’m good at finding words to describe my feelings.
3. I criticize myself for having irrational or inappropriate emotions.
4. I perceive my feelings and emotions without having to react to them.
5. When I do things, my mind wanders off and I’m easily distracted.
6. When I take a shower or bath, I stay alert to the sensations of water on my body.
7. I can easily put my beliefs, opinions, and expectations into words.
8. I don’t pay attention to what I’m doing because I’m daydreaming, worrying, or otherwise distracted.
9. I watch my feelings without getting lost in them.
10. I tell myself I shouldn’t be feeling the way I’m feeling.
11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
12. It’s hard for me to find the words to describe what I’m thinking.
13. I am easily distracted.
14. I believe some of my thoughts are abnormal or bad and I shouldn’t think that way.
15. I pay attention to sensations, such as the wind in my hair or sun on my face.
16. I have trouble thinking of the right words to express how I feel about things.
17. I make judgments about whether my thoughts are good or bad.
18. I find it difficult to stay focused on what’s happening in the present.
19. When I have distressing thoughts or images, I “step back” and am aware of the thought or image without getting taken over by it.
20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
21. In difficult situations, I can pause without immediately reacting.
22. When I have a sensation in my body, it’s difficult for me to describe it because I can’t find the right words.
23. It seems I am “running on automatic” without much awareness of what I’m doing.
24. When I have distressing thoughts or images, I feel calm soon after.
25. I tell myself that I shouldn’t be thinking the way I’m thinking.
26. I notice the smells and aromas of things.
27. Even when I’m feeling terribly upset, I can find a way to put it into words.
28. I rush through activities without being really attentive to them.
29. When I have distressing thoughts or images I am able just to notice them without reacting.
30. I think some of my emotions are bad or inappropriate and I shouldn’t feel them.
31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
32. My natural tendency is to put my experiences into words.
33. When I have distressing thoughts or images, I just notice them and let them go.
34. I do jobs or tasks automatically without being aware of what I’m doing.
35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
36. I pay attention to how my emotions affect my thoughts and behavior.
37. I can usually describe how I feel at the moment in considerable detail.
38. I find myself doing things without paying attention.
39. I disapprove of myself when I have irrational ideas.
Appendix B
Perceived Stress Scale

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.

Name ___________________________ Date ___________

Age _______ Gender (Circle): M F Other _________________________________

0 = Never  1 = Almost Never  2 = Sometimes  3 = Fairly Often  4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly? .................................................. 0 1 2 3 4

2. In the last month, how often have you felt that you were unable to control the important things in your life? .................................................. 0 1 2 3 4

3. In the last month, how often have you felt nervous and "stressed"? ........ 0 1 2 3 4

4. In the last month, how often have you felt confident about your ability to handle your personal problems? .................................................. 0 1 2 3 4

5. In the last month, how often have you felt that things were going your way? .................................................. 0 1 2 3 4

6. In the last month, how often have you found that you could not cope with all the things that you had to do? .................................................. 0 1 2 3 4

7. In the last month, how often have you been able to control irritations in your life? .................................................. 0 1 2 3 4

8. In the last month, how often have you felt that you were on top of things? .................................................. 0 1 2 3 4

9. In the last month, how often have you been angered because of things that were outside of your control? .................................................. 0 1 2 3 4

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? ................................... 0 1 2 3 4
Appendix C

Police Stress Questionnaire: Organizational subscale

Organizational Police Stress Questionnaire

Below is a list of items that describe different aspects of being a police officer. After each item, please circle how much stress it has caused you over the past 6 months, using a 7-point scale (see below) that ranges from “No Stress At All” to “A Lot Of Stress”:

<table>
<thead>
<tr>
<th>No Stress At All</th>
<th>Moderate Stress</th>
<th>A Lot Of Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Dealing with co-workers
2. The feeling that different rules apply to different people (e.g. favouritism)
3. Feeling like you always have to prove yourself to the organization
4. Excessive administrative duties
5. Constant changes in policy / legislation
6. Staff shortages
7. Bureaucratic red tape
8. Too much computer work
9. Lack of training on new equipment
10. Perceived pressure to volunteer free time
11. Dealing with supervisors
12. Inconsistent leadership style
13. Lack of resources
14. Unequal sharing of work responsibilities
15. If you are sick or injured your co-workers seem to look down on you
16. Leaders over-emphasise the negatives (e.g. supervisor evaluations, public complaints)
17. Internal investigations
18. Dealing the court system
19. The need to be accountable for doing your job
20. Inadequate equipment
Appendix D

Police Stress Questionnaire: Operational subscale

**Operational Police Stress Questionnaire**

Below is a list of items that describe different aspects of being a police officer. After each item, please circle how much stress it has caused you over the past 6 months, using a 7-point scale (see below) that ranges from “No Stress At All” to “A Lot Of Stress”:

<table>
<thead>
<tr>
<th>No Stress At All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

1. Shift work
2. Working alone at night
3. Over-time demands
4. Risk of being injured on the job
5. Work related activities on days off (e.g. court, community events)
6. Traumatic events (e.g. MVA, domestics, death, injury)
7. Managing your social life outside of work
8. Not enough time available to spend with friends and family
9. Paperwork
10. Eating healthy at work
11. Finding time to stay in good physical condition
12. Fatigue (e.g. shift work, over-time)
13. Occupation-related health issues (e.g. back pain)
14. Lack of understanding from family and friends about your work
15. Making friends outside the job
16. Upholding a "higher image" in public
17. Negative comments from the public
18. Limitations to your social life (e.g. who your friends are, where you socialize)
19. Feeling like you are always on the job
20. Friends / family feel the effects of the stigma associated with your job