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Locus of Control and Mindfulness as Moderators of the Job Demand-Control Model: Effects on Burnout

Basia Andrejko-Gworek
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Basia Andrejko-Gworek

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Walden University
2020

Abstract

Locus of Control and Mindfulness as Moderators of the Job Demand-Control Model:

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by

Basia Andrejko-Gworek

MS, Walden University, 2013

BS, Kaplan University, 2010

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Burnout is considered a health hazard of contemporary workplaces and additional research is needed to identify protective factors against this phenomenon. The job demand-control model specifies job control as the key buffer against strains, but empirical support for its buffer hypothesis is limited. The present study accounted for both structural and person factors and tested a revised hindrance job demand-control model in prediction of burnout. By incorporating the challenge-hindrance stress framework with tenets of the transactional stress framework and the differential reactivity of personality theory, it was proposed that inclusion of hindrance stressors (i.e., interpersonal conflict, role conflict and organizational politics) and two person variables of locus of control (LOC) and mindfulness as secondary moderators would enhance chances of validating the buffer hypothesis. A survey study of 300 U.S. adult workers from diverse occupational fields was conducted. The results from hierarchical multiple regression revealed no support for the hypothesized buffering effects. However, the buffer hypothesis was partially supported with findings showing high job control attenuating the effects of moderate levels of interpersonal conflict and concurrent high job control and high mindfulness attenuating the effects of moderate interpersonal conflict and organizational politics job demands. Also, all hindrance job demands were consistently associated with greater burnout. A qualitative match between hindrance demands, mindfulness, and burnout enhanced the buffering effects. The results promote social change in that employers could help alleviate burnout by considering workers' mindfulness and reducing hindrance job demands.

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Dedication

To my “Mamusia,” Rose. Thank you for your constant love and support and always believing in me and my ability to succeed, no matter how hard it gets. You mean the world to me! I love you, Mom.

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I want to acknowledge the support, love, and above all, patience that my husband, Roman, has always shown during what seemed like a never-ending journey. I am so grateful and fortunate for having you in my life. Special thanks to my dear friend and mentor, Sam Grove, who provided needed insight and encouragement and made me laugh when I wanted to cry. You brought light to many dark days, and I am forever grateful for that. Many thanks to Shahed Mahbub who offered support, understanding, and shared knowledge that helped make this possible. Thanks to Anne Marie DelPrincipe who provided support and a healthy dose of humor when I needed it the most.

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Chapter 1: Introduction to the Study

Introduction

Work is important to human experience (Hulin, 2014), but modern work environments are often significant sources of stress, posing a risk to the well-being of employees and, consequently, the organization (Ahola & Hakanen, 2014). Accordingly, research efforts beginning with early stress theories (e.g., Selye, 1950) to subsequent stress-management models (e.g., Johnson & Hall, 1988; Karasek, 1979) have attempted to gain insight into the factors implicated in work-related mental strain such as burnout. Such an empirical knowledge illuminating both risk and protective factors is crucial to preventive interventions aimed at reducing workers' stress and enhancing personal and organizational well-being.

Occupational stress researchers have identified and investigated a plethora of potential environmental antecedents to work strain, but Karasek's (1979) seminal occupational stress model, the job demand-control (JDC) model, specifies two broad psychosocial risk factors situated within a worker's environment that jointly predict strain and health: job demands and job control. Of special importance and interest to this investigation was the model's buffer hypothesis that predicts high job control buffering (or moderating) the detrimental effects of demands on health. Tests of the buffering effect of control as proposed by the JDC model—or with an added third moderating variable of social support, as in its modified version, the job demand-control-support (JDCS) model (Johnson & Hall, 1988)—however, have generally produced unsatisfactory results

(Hausser, Mojzisch, Niesel, & Schultz-Hardt, 2010; Kain & Jex, 2010), necessitating further inquiry.

Building on the most recent refinements to the conceptualization of stressors (i.e., job demands) using the challenge-hindrance stress framework (Cavanaugh, Boswell, Roehling, & Boudreau, 2000), as well as drawing from transactional stress theory (Lazarus & Folkman, 1984) and the differential reactivity model of personality (Bolger & Zuckerman, 1995), two individual characteristics of locus of control (LOC) and mindfulness were tested as moderators of the JDC model's dimensions in prediction of burnout. The results may help clarify the stressor-burnout relationship and, more importantly, assist in the development of effective burnout prevention and alleviation strategies.

Background

Work has the potential of fulfilling various human needs, such as power, self-determination, and meaning (DiFabio, 2017), but it also has a darker side. The postindustrial era has undergone dramatic changes in terms of advanced information and communication technologies, a rapid shift toward globalization, and related organizational restructuring (e.g., merges, downsizing). In the so-called "knowledge economy" of the 21st century (Litchfield, Cooper, Hancock, & Watt, 2016, p. 1), the modern workplace is characterized by greater psychosocial workload, reduced autonomy, and job insecurity, which contribute to work-related stress, adversely affecting worker health and well-being (Sparks, Faragher, & Cooper, 2001). The impact is seen in staggering individual and organizational costs. A recent review of studies published in

the United States and Europe (Hassard, Teoh, Visockaite, Dewe, & Cox, 2018) revealed the assessed work stress costs to be between \$221.13 million and \$187 billion, with 70%–90% representing production-related losses and the remaining 10%–30% being associated with health care and medical costs.

A common phenomenon considered an indicator of workers' ill health (Ahola & Hakanen, 2014) and a likely contributor to the above costs is employee burnout. This condition is believed to develop in response to an extended exposure to occupational stressors and is manifested through exhaustion of emotional and/or physical nature, depersonalization, and reduced personal/professional efficacy (Maslach & Leiter, 2016). Initially regarded as a work hazard of the helping professions (e.g., nursing, social work; Freudenberger, 1974; Leiter & Schaufeli, 1996), burnout is now known to affect workers in diverse sectors (Leiter, Bakker, & Maslach, 2014), and its prevalence rate is estimated at over 28% among the general U.S. workforce (Shanafelt et al., 2015). Furthermore, this condition exerts a toll on employees' health and is also associated with various work behaviors that may negatively contribute to organizational goals (Salvagioni et al., 2017). Especially concerning are recent findings from a nationally representative U.S. sample showing the presence of burnout in more than 50% of moderately and highly engaged or motivated employees, which also coincided with increased reported turnover intentions (Moeller, Ivcevic, White, Menges, & Brackett, 2018). In sum, these findings call for an enhanced understanding of the job stressor-strain relationship and, in particular, the very factors involved in the process that connects occupational stressors with burnout.

Problem Statement

Work can be a source of meaning and satisfaction in life, and not surprisingly, across generations, it has been regarded as an important part of people's identity (Hulin, 2014). Unfortunately, it can also be a source of stress, which when chronic and unattended to, may lead to burnout (Bakker & Costa 2014). Considering the negative impact of burnout on individual and organizational health, there is a need for research explicating the work stress-health relationship, delineating causal and protective factors important to prevention of this phenomenon.

Among many proposed causal models, the JDC model (Karasek, 1979) as well as its reconceptualized form the JDCS model (Johnson, 1989) have provided a theoretical platform for much of occupational stress research (Kain & Jex, 2010). The models' main assertions are that worker health and well-being are influenced by two independently varying structural factors in the workplace—namely, job demands (e.g., excessive workload) and decision latitude or job control (e.g., control over work tasks)—as in the JDC model (Karasek, 1979) and an additional third factor of work social support (e.g., supervisor support) in the extended JDCS model (Johnson & Hall, 1988). Furthermore, the main theoretical propositions are that conditions such as burnout are the result of additive or interactive effects of high demands and low control (strain hypothesis), or high demands, low control, and low social support (iso-strain hypothesis). Of special importance, however, is the assumption predicting well-being as proposed by the seminal buffer hypothesis, which relates exclusively to an interactive effect of demand and control, in that control with or without support moderates (or buffers) the toxic effect of

demands on health (i.e., burnout; Karasek & Theorell, 1990; Karasek, Triantis, & Chaudhry, 1982).

Despite a great volume of extant research in which researchers have tested the buffer hypotheses of the JDC/JDCS models with diverse occupations and strain outcomes, including burnout, supporting evidence seems to be lacking. In general, reports of the additive rather than interactive effects of demand, control, (and support) can be found (de Lange, Taris, Kompier, Houtman, & Bongers, 2003; Hausser et al., 2010; van der Doef & Maes, 1999). The null findings plaguing the JDC/JDCS literature have prompted changes to the conceptualization of the models' key constructs, with Dawson, O'Brien, and Beehr (2016), for instance, being guided by the challenge-hindrance stress framework (Cavanaugh et al., 2000) demonstrating a buffering effect of control (and support) on hindrance, but not on challenge type of stressors. While recognizing the two-dimensional nature of stressors (or job demands) seems important and warrants further study, research findings indicating both challenge and hindrance stressors being positively associated with strain (e.g., Lin, Ma, Wang, & Wang, 2015) suggest a far more complex stressor-strain relationship, with a likely involvement of conjunctive mediating or moderating variables.

The JDC/JDCS models theoretically link strain to work conditions, however, strain is also a function of individual difference variables (Zurlo, Pes, & Capasso, 2016). As the transactional stress theory (Lazarus & Folkman, 1984) contends, people differ in their appraisal of stressors (e.g., challenging vs. hindering) and resources (e.g., job control/support), and thus in their adaptation. Research evidence suggests that the

cognitive appraisal process represents an important mediating mechanism in the stressor-strain sequence (Gomes, Faria, & Goncalves, 2013), but it is also susceptible to further moderation exerted by dispositional variables (O'Driscoll & Dewe, 2001). Indeed, and consistent with the differential reactivity of personality theory prediction (Bolger & Zuckerman, 1995), which asserts that personality variables moderate the stressor-strain linkages, the empirical evidence suggests that personality characteristics affect individuals' perceptions of stressors, reactivity, and coping (Cash & Gardner, 2011; Matthews & Campbell, 2009), with some studies providing support for their moderating effect in both the challenge-hindrance stress framework (Lin et al., 2015; Zhu, He, & Wang, 2017) and the JDC/JDCS theory (Hystad, Eid, & Brevik, 2011; Meier, Semmer, Effering, & Jacobshagen, 2008).

Based on the aforementioned theoretical perspectives, it seems imperative to account for both structural and individual factors in tests of the buffer hypotheses. Thus, in this study, two person variables, LOC and mindfulness, were considered as potential moderators of the JDC model's dimensions. LOC plays a crucial role in how one perceives and responds to environmental conditions (i.e., objective job control and work demands; Rotter, 1966). Being on the internal LOC continuum denotes perception of controllability and facilitates an active coping style (Dijksra, Beersma, & Evers, 2011), which has been found to be positively correlated with job satisfaction (Bhardwaj & Gupta, 2017) and psychological well-being (Quevedo & Abella, 2014) and inversely with depression and burnout (Chakraborty, Chatterjee, & Chaudhury, 2012; Gray-Stanley et al., 2010). Similarly, mindfulness, the long-recognized antipode to lack of control (Piper

& Langer, 1986), is a metacognitive state of mind characterized by present moment awareness fostering positive reappraisal coping (Nila, Holt, Ditzen, & Aguilar-Raab, 2016), which has been linked with a myriad of salubrious benefits (i.e., reduced stress and burnout, improved psychological well-being; Rudaz, Twohig, Ong, & Levin, 2017). Thus, internal LOC and mindfulness may serve as buffers of the JDC/JDCS dimensions protecting workers from the adverse effects of work stressors.

To date, researchers have not examined mindfulness in the context of JDC/JDCS models' theory, and the limited research on LOC has generated equivocal findings (Daniels & Guppy, 1994; Meier et al., 2008; Parkes, 1991; Rodriguez, Bravo, Oeiro, & Schaufeli, 2001). To fill this lacuna and help reconcile conflicting results, respectively, I tested the buffer hypothesis of the JDC model by considering the results by Dawson et al. (2016) and focusing on hindrance type of demands, as well as evaluating the potential buffering role of LOC and mindfulness on burnout as the outcome variable. Inclusion of person factors in the JDC model may deepen understanding of the stressor-burnout relationship, an insight necessary for burnout prevention efforts.

Purpose of the Study

The central aim of this quantitative study was to evaluate the moderating role of LOC and mindfulness on the key dimensions of the JDC model. The original JDC model specifies job control as the main construct mitigating the noxious effects of job demands on employee health. Although perception of control has long been recognized as a determinant of health (Ganster & Fusilier, 1989; Skinner, 1996), it is susceptible to the influence of individual difference variables such as dispositions (Spector, 2000). Thus, I

expected that LOC and mindfulness would function as secondary moderating factors—that is, personal factors that further moderate the effect of the primary moderator (i.e., job control). In addition, I gave attention to hindrance type of work demands rather than challenge demands, which should increase chances of finding the postulated interaction effects (e.g., Dawson et al., 2016). Therefore, LOC and mindfulness were examined as potential secondary moderating variables in the hindrance demand, job control-burnout relationship.

Research Questions and Hypotheses

In this study, I investigated whether LOC and mindfulness would further moderate the impact of job control (the primary moderator in the original JDC model) on the hindrance (interpersonal conflict, role conflict, and organizational politics) stressor-burnout relationship. Thus, separate questions and hypotheses were developed for the two moderators reflecting their secondary conditioning role. The original buffer hypothesis in which control exerts the primary moderating effect on the hindrance-burnout relationship was also proposed.

RQ1: Is the relationship between demands of hindrance nature (interpersonal conflict, role conflict, and organizational politics) and burnout moderated by job control?

H₀₁: Interpersonal conflict and job control interaction will not be related to burnout so that no joint burnout moderating effect of job control and interpersonal conflict will be detected.

H₁₁: Interpersonal conflict and job control interaction will be related to burnout, such that increased levels of job control will weaken the association between interpersonal conflict and burnout.

H₀₁₂: Role conflict and job control interaction will not be related to burnout so that no joint burnout moderating effect of job control and role conflict will be detected.

H₁₂: Role conflict and job control interaction will be related to burnout, such that increased levels of job control will weaken the association between role conflict and burnout.

H₀₁₃: Organizational politics and job control interaction will not be related to burnout so that no joint burnout moderating effect of job control and organizational politics will be detected.

H₁₃: Organizational politics and job control interaction will be related to burnout, such that increased levels of job control will weaken the association between organizational conflict and burnout.

RQ2: Is the relationship between demands of hindrance nature (interpersonal conflict, role conflict, and organizational politics) and job control combinations and burnout moderated by LOC?

H₀₂₁: Interpersonal conflict, job control, and LOC interaction will not be related to burnout, so that no joint burnout moderating effect of job control and LOC will be detected.

H₁₂₁: Interpersonal conflict, job control, and LOC interaction will be related to burnout, such that increased levels of job control and LOC will weaken the associations between interpersonal conflict and burnout.

H₀₂₂: Role conflict, job control, and LOC interaction will not be related to burnout, so that no joint burnout moderating effect of job control and LOC will be detected.

H₁₂₂: Role conflict, job control, and LOC interaction will be related to burnout, such that increased levels of job control and LOC will weaken the associations between role conflict and burnout.

H₀₂₃: Organizational politics, job control, and LOC interaction will not be related to burnout, so that no joint burnout moderating effect of job control and LOC will be detected.

H₁₂₃: Organizational politics, job control, and LOC interaction will be related to burnout, such that increased levels of job control and LOC will weaken the associations between organizational politics and burnout.

RQ3: Is the relationship between demands of hindrance nature (interpersonal conflict, role conflict, and organizational politics) and job control combinations and burnout moderated by mindfulness?

H₀₃₁: Interpersonal conflict, job control, and mindfulness interaction will not be related to burnout, so that no joint burnout moderating effect of job control and mindfulness will be detected.

H₁₃₁: Interpersonal conflict, job control, and mindfulness interaction will be related to burnout, such that increased levels of job control and mindfulness will weaken the associations between interpersonal conflict and burnout.

H₀₃₂: Role conflict, job control, and mindfulness interaction will not be related to burnout, so that no joint burnout moderating effect of job control and mindfulness will be detected.

H₁₃₂: Role conflict, job control, and mindfulness interaction will be related to burnout, such that increased levels of job control and mindfulness will weaken the associations between role conflict and burnout.

H₀₃₃: Organizational politics, job control, and mindfulness interaction will not be related to burnout, so that no joint burnout moderating effect of job control and mindfulness will be detected.

H₁₃₃: Organizational politics, job control, and mindfulness interaction will be related to burnout, such that increased levels of job control and mindfulness will weaken the associations between organizational politics and burnout.

Theoretical Framework

The main stress framework being investigated in this study was the JDC model (Karasek, 1979). The model is environmentally based in that it predicts both strain and health of the worker (i.e., buffer hypothesis) with two situational variables of job decision latitude (or job control) and job demands (i.e., workload). A psychological condition such as burnout is predicted by either an additive or interactive association between high

demands and low control and its risk minimized when high job control exerts a moderating influence on the health damaging job demands.

Due to the salience of psychosocial variables in the JDC model and clear omission of individual difference variables, which have been suggested to account for the weak support of the buffer hypothesis (Kain & Jex, 2010), two additional frameworks were used to justify the importance of simultaneous examination of both person and environmental variables in validation of the JDC buffer hypothesis: the transactional stress theory (Lazarus & Folkman, 1984) and the differential reactivity of personality theory (Bolger & Zuckerman, 1995).

The transactional stress theory (Lazarus & Folkman, 1984) highlights stress/strain as a product of person-environment interaction, also termed *transaction* and occurring whenever environmental conditions become taxing, exceeding a person's resources to respond adaptively. Furthermore, the main tenet of this relational perspective of stress is that cognitive appraisal or ways in which a person evaluates the environmental conditions or stressors (i.e., challenging vs. hindering) and coping (i.e., emotion-focused vs. problem-focused) are the key mechanisms operating in the stressor-strain sequence. This proposition has been supported by literature demonstrating cognitive appraisal and coping (e.g., emotion-focused) as factors linking stressors with various forms of strain, including burnout (Gomes et al, 2013) as well as other work-related outcomes (i.e., performance; Gonzalez-Moralez & Neves, 2015).

The transactional perspective of stress acknowledges, but downplays, the role of person factors (e.g., dispositions) in the person-environment transaction despite research

findings suggesting appraisal and coping can be influenced by personality (Matthews & Campbell, 2009). Thus, the differential reactivity of personality theory (Bolger & Zuckerman, 1995), which predicts that personality acts as a moderator of the stressor-strain relationship, was used as a supporting framework. The moderating role of dispositional variables has been demonstrated in the context of both the challenge-hindrance model (Lin et al., 2015; Rodell & Judge, 2009; Zhu et al., 2017) and the JDC/JDCS theory (Hystad et al., 2011; Meier et al., 2008).

Definitions

Burnout: This construct represents a form of strain and a dependent variable in this study. It is a psychological response to chronic work stressors characterized by three main features: exhaustion (emotional/physical), depersonalization, and low self-efficacy (personal/professional; Maslach & Leiter, 2016).

Challenge stressors: Representing one of two dimensions of stressors in the challenge-hindrance stress model (Cavanaugh et al., 2000), challenge stressors are those stressors that tend to be appraised as rewarding and growth promoting and include (a) workload, (b) time pressure, and (c) job responsibility.

Decision latitude (or job control): Generally referred to as job control or discretion, decision latitude is the key buffering or moderating component of the JDC model (Karasek, 1979) and relates to perceived control over the work environment (e.g., tasks). Its two main components are skill level and decision-making power.

Hindrance stressors: Representing one of two dimensions of stressor in the challenge-hindrance stress model (Cavanaugh et al., 2000), hindrance stressors are those

stressors that tend to be perceived as demands hindering goal achievement and personal/professional growth and include interpersonal conflict, role conflict, and organizational politics.

Job demands: This construct is the independent variable and one of the components of the JDC (Karasek, 1979) model and relates to stressors in the workplace such as workload and time pressure.

Locus of control (LOC): This construct relates to the extent to which people attribute outcomes to their own behavior (internal) or outside forces (external). The internal LOC is characterized by a perception of controllability over outcomes that facilitates an action-oriented response to stressors. Conversely, the external LOC is characterized by a perception of uncontrollability over stressors which facilitates a passive type of response to stressors (Rotter, 1966).

Mindfulness: Conceptualized as an intentional state of present-moment awareness in which judgments are suspended and greater openness to experience occurs, enhancing psychological flexibility needed for adaptive stress responding (Bishop et al., 2004).

Assumptions

Several assumptions were made with regards to the measurement of the variables and relationships between them. For example, I assumed that each instrument selected was most appropriate for measuring the key variables in this study. While there are many instruments a researcher can choose from, a thorough review of literature and, more specifically, findings from validation studies can guide the selection process.

I also assumed that the study participants would understand the survey questions and answer them honestly and to their best ability. Because the survey was completed on the Internet by previously recruited online panelists who have made a commitment to participate in various surveys, controlling for the quality of the answers was difficult. Nevertheless, certain procedures were implemented to enhance the quality of responses. For instance, the survey questionnaire included clear instructions for each set of questions. Also, the panel company engages in an extensive profiling process of potential panelists and regularly monitors the online sample stream for consistency (e.g., participation frequency, undesired survey behavior), which helped reduce any self-selection bias and nonresponse bias. Moreover, the panel company protects and secures survey respondents' personal information by using industry's standard firewalls and advanced information technology (IT) security measures. In addition, participants' identifying information was not shared with me or any research provider. This information, including the voluntary nature of participation (i.e., becoming a panel member) is explained in the panel company's privacy policy, which is provided to every potential panel member during the opt-in process (ESOMAR, 2018). This information was also included as part of the informed consent prior to survey completion, which likely increased the comfort level needed for honest responding. Finally, survey participants were offered monetary and nonmonetary incentives, which have been linked with improved quality of data in past research (Callegaro et al., 2014).

Finally, I assumed that LOC, mindfulness, and job control could moderate both linear and nonlinear relationships between the job demands examined in this study and

burnout. Per Warr's (1990) vitamin model, work characteristics function similarly to vitamins, which tend to be effective to a certain point after which the desired positive impact wanes or even becomes detrimental. When applying this analogy to the JDC model, one could observe the variable of job control, for instance, to be positively related to burnout at both low and high levels. Control at low levels may be associated with burnout due to lack of resources available to an employee needed to withstand high work demands. Control at high levels may also be associated with burnout, such as when greater control is accompanied by increased responsibility for assigned tasks or decision making resulting in distress (De Jonge & Shaufeli, 1999). Thus, there is a possibility of an inverted U-shaped type of relationship between job demands and job control, which when not controlled for in the regression analysis may lead to the observed interaction effect being spurious or, in other words, significant when in fact no true interaction exists (Ganzach, 1997).

When investigating the moderator of LOC, I observed that this variable had a positive correlation with burnout, which suggested a possible inverted U-shaped type of relationship between these variables. Thus, and as recommended by previous researchers (e.g., Fletcher & Jones, 1993; Ganzah, 1997; Terry & Jimmieson, 1999), a quadratic term of LOC was included in subsequent regression analysis to ensure obtaining an accurate estimation of the moderating effect.

Limitations

This study was expected to have some methodological limitations. I used a cross-sectional design, which precludes me from drawing causal inferences. In such a design,

control techniques that could eliminate alternative explanations for the observed relationships between the variables studied are not employed (Zechmeister, Zechmeister, & Schaughnessy, 2001). Despite this limitation, the inclusion of two moderators (LOC and mindfulness) could elucidate how such conjunctive variables modify the strength of the relationship between the variables (i.e., job demands and burnout; MacKinnon, 2011), thus providing some insight into the likely operating causal processes (Visser, Krosnick, & Lavrakas, 2000).

Furthermore, the assessment of the main variables was performed with self-report measures, that represented participants' perceptions rather than objective reality. Hence, subjective bias may have led to common method variance (or variance attributable to the subjective measurement method), resulting in inflated/deflated correlations between variables (Spector, 2006). Certainly, subjective measurement has limitations, but it is the most frequently employed method in the occupational stress literature. Such an assessment method allows focusing on the individual, tapping into cognitive processes (e.g., appraisal or coping strategies), that color perception of the environmental conditions (Frese & Zapf, 1988). Moreover, it is quite difficult to obtain accurate information on people's internal states (e.g., emotions or attitudes) using other forms of measurement (Spector, 2006). To enhance the accuracy of the data obtained using self-report measures, I exercised care in selecting instruments for this study based on supporting validation research.

Another limitation of this study pertains to focusing only on workers who have access to the Internet and who agree to join the online panel and participate in various

survey projects. Thus, survey respondents were those who self-selected to participate in the online panel rather than being randomly chosen from a sampling frame consisting of all members of the population of interest. A centralized frame consisting of all people on the Internet does not exist. Such an Internet population has been found to be associated with several factors, including being younger, male, having more education and higher earnings, and being Caucasian or Asian and not Hispanic (Horrigan, 2010). This places limits on the sample representativeness, which affects ability to generalize the results beyond the population used for this study. To help address this issue, I used a demographic quota so that the sample best represented the U.S. population in terms of gender and ethnicity.

Scope and Delimitations

There were several characteristics of this study that limited its scope and defined the boundaries of the investigation. For instance, while many occupational stress models have been proposed (Spector, 2000), I selected the JDC model to investigate the effects of job demands on strain (i.e., burnout). The JDC model has enjoyed a prominent position in the literature not only for its parsimony but for emphasizing control as the main moderating factor attenuating the health damaging effects of work stressors or high job demands (Kain & Jex, 2010). Because control has long been recognized as being of great importance when attempting to understand psychological functioning and adaptation (Terry & Jimmieson, 1999), the JDC model with its exclusive focus on job control as the buffering variable seemed ideal to elucidate the stressor-burnout association.

Considering the lack of consistent empirical support for the JDC model's buffer hypothesis and being guided by the transactional stress theory (Lazarus & Folkman, 1984), which describes stress/strain as a product of the person-environment interaction, I expanded the JDC model by including dispositional factors of LOC and mindfulness as secondary moderators. Examining situational (i.e., job control) and person variables simultaneously could offer new insights into the moderating role of job control. As suggested by the differential reactivity personality model (Bolger & Zuckerman, 1995), dispositions act as moderators in the stressor-strain relationship, a proposition supported by a wealth of research (e.g., Grant & Langan-Fox, 2007; Liu, Song, & Wang, 2011; Rubino, Milam, Spitzmuller, Malka, & Zapf, 2008). While there are many dispositional variables that could be examined for their potential moderating qualities, I selected LOC and mindfulness due to their important role in perception of control. For instance, LOC has been widely recognized as the main dispositional antecedent of control perceptions at work (Ganster & Fusilier, 1989). Similarly, mindfulness as a purposeful state of present-moment awareness has been associated with greater sense of agency, allowing an individual to respond flexibly rather than conform to the status quo (Fatemi & Langer, 2017).

In addition to extending the JDC model by including dispositional factors as potential moderators, I limited focus to demands of hindrance nature (e.g., interpersonal conflict, role conflict, and organizational politics), as posited by the challenge-hindrance framework (Cavanaugh et al., 2000) rather than those as originally conceptualized by Karasek and typically examined in the literature (e.g., workload). The conceptualization

of demands has been suggested as a factor in inconsistent support found for the JDC model's buffer hypothesis (van der Doef & Maes, 1999). Indeed, a recent test of the JDC model by Dawson et al. (2016) in which demands were conceptualized as hindrances produced results in line with the buffer hypothesis. Thus, this study aimed to extend on these results by testing the moderating role of control on its own and in the presence of secondary moderators.

Finally, this study was limited to a specific target population that included online panelists who were American working adults (ages 18–65) from diverse occupational industries and of various occupations, working a minimum of 30 hours per week. The sample was culturally diverse in that it reflected the current census. Using such an online-based sample increases accessibility to difficult-to-reach populations (e.g., minorities; Baker et al., 2010). In addition, focusing on adult workers reduces the risk of any emotional harm that could be experienced by younger individuals. Including different age groups (e.g., younger and older workers) with a minimum hourly requirement also increases chances of detecting burnout, which may occur early or late in a career (Ahola, Honkonen, Virtanen, Aromaa, & Lonnqvist, 2008) and with greater weekly amount of time spent on the job (Balch et al., 2010).

Significance of the Study

Validating the JDC model's buffer hypothesis with conjunctive person variables of LOC and mindfulness and focusing on hindrance type of demands, as proposed by the challenge-hindrance model (Cavanaugh et al., 2000), has important practical, theoretical, and social change implications. From the practical perspective, obtaining support for the

proposed interactive effects would suggest that increasing job control would not be sufficient without considering unique employee characteristics in relation to the nature of work demands (e.g., challenge-hindrance). Hence, organizational practices, policies, and training programs would need to account for workers' differences in LOC and mindfulness in addition to increasing job control to prevent burnout.

Contribution to the JDC theory would be evident in that supportive findings would indicate the need to expand the model to include person variables to detect the theorized interaction effects. Moreover, successful employment of the two-dimensional classification of demands, as per the challenge-hindrance model (Cavanaugh et al., 2000), may further assist in future tests of the model. Detecting interaction effects in the expected form may also help prevent the JDC buffer hypothesis from being discredited and continue making valuable contributions to the occupational stress literature.

Finally, the focus on the JDC model's buffer hypothesis that predicts the health of employees, has important social change implications. Burnout affects diverse professional groups and adversely impacts individual and organizational health (Salvagioni et al., 2017), which contributes to the financial burden of work stress on a society (Hassard et al., 2018). Moreover, work is an important source of meaning in people's lives and an essential dimension of self-identity (Hulin, 2014). These facts strongly indicate that prevention of burnout should be at the forefront of organizational policy, planning, and job design. This study's findings may be of value to organizations interested in improving the psychological health of their workers.

Summary

The prevalence of burnout in today's modern workplace and its individual, organizational, and societal costs call for greater understanding of the job stressor-burnout relationship. The JDC model has enjoyed a prominent position in the occupational stress research domain (Kain & Jex, 2010), but as research indicates, the predictive power of its seminal buffer hypothesis may be improved by not only focusing on hindrance type of demands, as suggested by the challenge-hindrance model (Cavanaugh et al., 2000) and recommended by Dawson et al. (2016), but also integrating both individual and structural factors into the model. Guided by the transactional stress theory (Lazarus & Folkman, 1984) and the differential reactivity model (Bolger & Zuckerman, 1995), this study was conducted to test the moderating role of LOC and mindfulness on the hindrance stressor-burnout association in the context of the JDC model. The results may help illuminate the dynamics of the complex stress process and be important to future occupational stress literature and to the organizational burnout prevention efforts.

The focus of this study involved examining the secondary moderating role of LOC and mindfulness on the hindrance stressor, job control-burnout relationship. To provide an empirical justification for such an investigation, Chapter 2 includes a literature review on the construct of burnout, the JDC model, the moderators of LOC, mindfulness, and job control, and supporting theoretical frameworks. Chapter 3 includes a discussion on research methods employed in this investigation, including a review of instruments measuring the key variables: the Interpersonal Conflict at Work Scale (ICAWS, Spector

& Jex, 1998), Role Conflict Scale (RCS; Bowling, 2017), Perception of Organizational Politics Scale (POPS; Kacmar & Carlson, 1997), Factual Autonomy Scale (FAS; Spector & Fox, 2003), the Internal-External Control Scale (I-E; Rotter, 1966), Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), and Oldenburg Burnout Inventory (OLBI; Halbesleben & Demerouti, 2005). Chapters 4 and 5 focus on obtained results and interpretation of findings, respectively.

Chapter 2: Literature Review

Introduction

Burnout is a stress syndrome that has been deemed a health hazard of the 21st century, contemporary workplace (Leiter et al., 2014). Although research has deepened knowledge about this phenomenon in terms of likely antecedents and far-reaching negative consequences, less is known about crucial protective factors (McGeary & McGeary, 2012). Unlike any other occupational stress theory, the JDC model (Karasek, 1979) offers a parsimonious framework in which a combination of a limited set of structural work factors predict not only strain but also health: job demands and job control. The predictive power of the model's buffer hypothesis that high job control exerts a moderating (or buffering) effect on the job demand (stressor)-strain relationship was the main focus of this study.

This literature review has several goals. I begin by justifying the general need for the present inquiry by providing a background of the modern, stressful work context as being conducive to development of poor health and burnout, necessitating knowledge of protective factors. This discussion includes the scientific basis for the burnout construct and research evidence linking stress and burnout with adverse individual and organizational health outcomes. Next, I present the JDC model, including its distinct propositions as well as practical and theoretical implications of the seminal buffer hypothesis. Special attention is given to research attempts validating the buffer hypothesis of the JDC model and of its extended version, the JDCS model, with different designs across diverse populations and outcomes, including burnout. Furthermore, and

based on weak and inconsistent empirical evidence for the buffer hypotheses (Hausser et al., 2010; van der Doef & Maes, 1999) as well as specific stress theories and research, major limitations of the JDC/JDCS models most likely accounting for the equivocal findings are identified and specific theoretical changes are proposed.

First, in response to the models' failure to recognize the existence of different types of stressors (or job demands), the challenge-hindrance stress model (Cavanaugh et al., 2000) and relevant research is used to demonstrate the need to focus specifically on hindrance type of demands. Second, in consideration of the models' neglect to account for individual difference variables and the possibility of conjunctive moderator effects, both the transactional stress framework (Lazarus & Folkman, 1984) and the differential reactivity of personality theory (Bolger & Zuckerman, 1995) are used to support inclusion of LOC and mindfulness as secondary moderators of the JDC model's components. Tenets of the transactional stress framework and the process of cognitive appraisal represent the main theme unifying selected, supportive theories, strengthening the argument for the proposed changes to the original JDC model and its test in the current study. The review concludes with research on LOC and mindfulness, revealing current gaps in knowledge, further substantiating the need for the present investigation.

Literature Search Strategy

The research evidence used for this literature review derives from multiple sources, including peer-reviewed journal articles and secondary sources (e.g., books, research reviews). I performed an extensive search of the literature through Walden University Library using various electronic databases, such as PsychINFO, PsycArticles,

ProQuest Science Journals, Science Direct, Thoreau Multi-Database Search, and Google Scholar. My search centered on relevant areas using terms such as the *job demand-control model*, *transactional stress theory*, *the challenge-hindrance model*, *differential reactivity of personality theory*, *locus of control*, *dispositional mindfulness*, *burnout*, *occupational stress and health*, and *stressor-strain relationship*.

Work, Stress, and Employee Health

Work can exert both positive and negative effects on people's health and well-being. Through work, people can become autonomous beings, develop unique skills and social and professional relationships. Work fulfills not only basic existential needs (i.e., survival through financial rewards), but also needs for power, self-determination, being needed, and for life that is more meaningful and purposeful (Di Fabio, 2017; Hulin, 2014; Ward & King, 2017). Perhaps the absence of work and its detrimental impact on people's health best illustrates the centrality and importance of work. For instance, research by Wanberg (2012) and others (e.g., Schob, 2012; Wanberg, Zhu, & Hooft, 2010) has revealed that unemployed individuals often experience general apathy, low self-esteem, low self-concept, poor psychological health (e.g., depression, anxiety), higher risk of suicide and parasuicide (or self-harm behaviors), and reduced physical health.

Despite the many health benefits of being employed, work can also thwart individuals' well-being. This adverse impact is evident in the changed nature of work and organizational structure during the postindustrial era. Work in the United States and other developed nations has evolved from manufacturing to predominately service-oriented enterprises, also referred to as the *knowledge economy*. The rapidly expanding and highly

competitive global market has forced many organizations to restructure, downsize, merge/consolidate with other entities or outsource work domestically or internationally. Furthermore, the advancement in information and communication technologies (e.g., the World Wide Web, e-mail, cellular phones) has not only created millions of new jobs, but also significantly changed how work is conducted and managed (Litchfield, Cooper, Hancock, & Watt, 2016). Additionally, a number of economic crises, such as the Savings and Loan Bailout in the 1980s (Donaldson, 2012) and the 2007–2009 Major Recession (Boeri, Garibaldi, & Moen, 2013), have resulted in workforce reductions, forcing many companies to “do more with less,” (Graham, Howard, & Dougall, 2012, p. 43), an organizational philosophy that has persisted throughout the years (van Dun, Hicks, & Wilderom, 2017).

All these changes have affected individual workers who are expected to acquire new knowledge and skills and demonstrate adaptability to increased work demands and decreased autonomy (Gatchel & Kishno, 2012), often at the expense of work stress, with consequent decrements in mental and physical health and well-being. For instance, employees exposed to chronic job stressors are at higher risk for developing psychological conditions such as depression and anxiety (Szeto & Dobson, 2013; Thorsteinsson, Brown, & Richards, 2015) and to engage in health-damaging habits such as smoking and other substance use (Griffiths, Royse, & Walker, 2018; Heikkila et al., 2013). Their vulnerability to physical injury (Lee, Faucett, Gillen, Krause, & Landry, 2013; Mosadeghrad, 2014) as well as development of other health ailments such as

cardiovascular disease (Fishta & Backe, 2015; Li, Loerbroks, Bosma, & Angerer, 2016), also increases.

Research indicates that work absenteeism and presenteeism (or working while ill) are common among workers with poor health, negatively impacting productivity levels (Stromberg, Aboagye, Hagberg, Bergstrom, & Lohela-Karlsson, 2017). The economic costs of a stressed and ill workforce are substantial. In the United States, productivity losses of presenteeism associated with depression alone have been estimated to exceed \$84 billion, with the mean per person cost of \$5,524 (Evans-Lacko & Knapp, 2016). In some nations, the overall cost of work-related stress has been assessed at between \$221.13 million (Australia) and \$187 billion (United States), with production losses being the largest and estimated at 70%–90% and healthcare/medical costs comprising the other 10%–30% (Hassard et al., 2018). Equally alarming are reports of excess mortality estimates associated with stress induced by common workplace stressors (i.e., low job control, high work demands, job insecurity), which in the United States have been found to account for 120,000 deaths annually, more so than the total number of deaths from diabetes (Goh, Pfeffer, & Zenios, 2015). In aggregate, the findings clearly indicate that work stress exerts a great toll on both workers and organizations.

Conceptualization and Key Components of Burnout

A likely contributor to the work-stress associated health/organizational expenditures and a concern for both workers and employers alike is the burnout phenomenon. This condition was initially identified by Freudenberger (1974) as a form of “career crisis” of human services workers (Leiter et al., 2014, p. 1) and subsequently

conceptualized and operationalized by Maslach (1976; Maslach & Jackson, 1981; Maslach, Schaufeli, & Leiter, 2001). Based on Maslach's model (Maslach & Leiter, 2016), *burnout* is a psychological syndrome stemming from chronic exposure to emotional and interpersonal stressors in the work context and comprised of three interconnected components: (a) exhaustion (emotional and physical), (b) depersonalization, and (c) perception of diminished self-efficacy. The exhaustion, a central quality of burnout, represents the individual stress dimension and is characterized by depletion of mental and physical energy. The related component of depersonalization relates to the interpersonal context dimension and is seen in symptoms of a cynical stance toward the job and clients. And perception of diminished self-efficacy refers to the self-evaluation dimension, often involving negative self-assessments of job skills, abilities, or accomplishments (Maslach et al., 2001). These three features of burnout characterize burnout's process-like developmental trajectory, with exhaustion developing first, followed by feelings of depersonalization, and eventually reduced professional/personal efficacy (Maslach & Leiter, 2016). To illustrate the process, an exhausted employee is someone who has depleted their coping energy, which has been spent on the ever-increasing job demands and overload. To adapt, the worker increasingly begins relying on energy conserving strategies, which is best accomplished by detachment and defensiveness (e.g., negative reactions to work and others), characterizing the second dimension of depersonalization. Finally, this second stage, if persistent, leads to feelings of inadequacy and a sense of personal/professional failure, representing the third stage of inefficacy (Maslach & Leiter, 2016). This tripartite model of burnout with the aid of

occupation specific (i.e., Maslach Burnout Inventory-Human Services Survey, MBI-HSS) and general burnout (i.e., Maslach Burnout Inventory-General Survey, MBI-GS) measures has been empirically scrutinized, confirming the occurrence of this condition across diverse occupations and countries (Maslach & Leiter, 2016). Burnout's prevalence has been estimated at over 28% among the general U.S. working population, and in certain professions (i.e., physicians), it exceeds 48% (Shanafelt et al., 2015).

Despite the wealth of research on burnout, its multidimensional structure and measurement, as posited by the architects of the model (Maslach, 1976; Maslach & Jackson, 1981), have been challenged in both research and practice. Some researchers have relegated burnout to a simple state of mental/physical exhaustion, its core feature, paying little attention to the other dimensions of depersonalization and professional inefficacy (Maslach & Leiter, 2016). Similarly, in the context of clinical practice, and in Northern Europe in particular, burnout has been accepted as a diagnosable medical condition under the labels of fatigue type syndromes (e.g., vital exhaustion, work-related neurasthenia) included in the 10th edition of the *International Statistical Classification of Diseases and Related Health Problems* (ICD-10; World Health Organization, 1992, as cited in Friberg, 2009). In addition, there has been an ongoing debate on whether burnout is distinct from depression due to the two conditions' comorbidities and overlapping symptomatology (i.e., exhaustion, negative mood), including links with the stress process, resulting in some scholars questioning burnout being a separate entity (Bianchi, Schonfeld, & Laurent, 2017).

If a singular construct of exhaustion or simply work-related depression represent the burnout phenomenon, there would seem to be no need for a syndrome of burnout. However, a wealth of data indicates that unlike exhaustion or depression, burnout is not only a persistent state, but also encompasses social experiences unique to the work context and an individual's perception of self and others, which are well captured by its other dimensions of depersonalization and self-efficacy (Day & Leiter, 2014; Maslach & Leiter, 2016). Such experiences of workers are important, and this is reflected in the scientific interest in burnout, which has grown exponentially, generating new knowledge and understanding of this phenomenon and its far-reaching impact on worker health. The negative health and organizational consequences of burnout are vast and costly to individual workers, organizations, and society at large. Thus, it seems imperative to identify the factors involved in the work stress-burnout relationship, which would assist in prevention efforts. This represents the important, overarching objective of this study.

Burnout and Health

The relationship between occupational burnout and diminished mental and physical health was first discovered by Freudenberger (1974, 1975, 1977) who has described the burned-out worker as exhausted and fatigued, often suffering from a host of physical ailments (e.g., frequent headaches, sleeplessness, shortness of breath), behavioral changes (e.g., cynical attitude, substance use), and clear depression. These initial observations have since been examined empirically with research from multidisciplinary fields (Laurent, Bianchi, Schonfeld, & Vandel, 2017). As a chronic, work-related stress condition (Maslach et al., 2001) and similar to other stress-induced

disorders (e.g., depression), burnout affects the physiological processes involved in stress response and adaptation (Bellingrath, Weigl, & Kudielka, 2009; Juster et al., 2011). Chronic stress exposure undermines the functioning of major systems (e.g., the hypothalamic-pituitary-adrenal (HPA) axis, the autonomous nervous system, and the metabolic, cardiovascular, and immune systems, contributing to allostatic load, or in simpler terms, the “wear and tear” of the body and brain, leading to development of mental and physical illnesses (Karatsoreos & McEwen, 2011, p. 576). In the sections that follow, I present empirical evidence for the burnout-to-illness path, including its link with detrimental organizational outcomes.

Burnout and Mental Health of Workers

A wealth of empirical data deriving from cross-sectional and prospective research demonstrates a relationship between burnout and poor mental health of workers. Although past research has explored burnout and its link with various mental health conditions, its relationship with depression has been most researched, particularly because the two conditions seem to be qualitatively similar (e.g., low energy, presence of negative emotions; Bianchi & Schonfeld, 2016). Cross-sectional research has shown high prevalence of burnout-depression co-occurrence, with moderate to high positive correlations between the constructs and correspondence in symptom severity (Bianchi, Mayor, Schonfeld, & Laurent, 2016; Chiu et al., 2015; de Vasconcelos, De Martino, & de Souza Franca, 2018). More recent data also points to burnout increasing the probability of concurrent depression (odds ratio, 5.33; 95% CI, 1.26-22.57; de Vasconcelos et al., 2018), a finding supported by prospective research that has documented burnout being an

antecedent to depression (Shin, Noh, Jang, Park, & Lee, 2013; Hakanen & Schaufeli, 2012; Hakanen, Schaufeli, & Ahola, 2008). In addition, some studies have shown that burnout can develop in tandem (Ahola, Hakanen, Perhoniemi, & Mutagen, 2014), or be reciprocally related with depression (Toker & Biron, 2012; Ahola & Hakanen, 2007), which suggests that both conditions contribute to a negative stress cycle, reciprocally influencing each other and facilitating worsening of their respective symptoms. Overall, the findings paint a complex and dynamic burnout-depression association affecting the mental health of workers.

Burnout's link with other mental health conditions has also been reported. The research, although scarce in comparison to that of burnout and depression, provides evidence for various such comorbidities. In addition to depression, burnout has been found to co-occur with anxiety, with studies demonstrating moderate to high correlations (Creedy, Sidebotham, Gamble, Pallant, & Fenwick, 2017; Ding, Qu, Yu, & Wang, 2014; Organopoulou, Tsironi, Malliarou, Alikari, & Zyga, 2014; Gallego-Alberto et al., 2018; Zhou et al., 2016), and anxiety levels paralleling those of burnout's dimensions (i.e., severe burnout accompanied by severe anxiety; van Dam., 2016). Similarly, research has shown burnout to highly coincide with (Cieslak et al., 2014) as well as predict (Shoji et al., 2015) secondary traumatic stress (or indirect trauma), a condition common among human services workers.

Other reports have documented burnout to coexist and positively correlate with insomnia (Kousloglou et al., 2014; de Beer, Pienaar, & Rothmann, Jr., 2014), substance use, and in particular, alcohol abuse and dependency (Jackson, Shanafelt, Hasan, Satele,

& Dyrbye, 2016; Pedersen, Sorensen, Brunn, Christensen, & Vedsted, 2016; Shepherd, Fritz, Hammer, Guros, & Meier, 2018), current (Balayssac et al., 2017) and future (Leiter et al., 2012; Madsen, Lange, Borritz, & Rugulies, 2015) psychotropic drug use, as well as suicidal risk (Chati et al., 2017; Lhereux, Truchot, & Borteyrou, 2016; Ozkan, Uzlas Karaman, Ozturk, Ahun, & Selmi, 2015). In sum, while not all studies illustrate the temporal relationship between burnout and other mental health conditions, burnout's impact on worker emotional and social functioning is likely to be especially great in the presence of other mental health conditions, as suggested by recent reports (e.g., Tuithof et al., 2017).

Burnout and Physical Health of Workers

A wealth of research data has found support for burnout being a factor in various physical health conditions among the working population, an unsurprising fact considering research identifying work stress (or stressors) being connected with decrements not only in mental, but also physical well-being (Griffiths, Royse, & Walker, 2018; Nakao, 2010). One of the often reported burnout physical correlates is cardiovascular disease (i.e., coronary heart disease; Salvagioni et al., 2017), with prospective reports using large samples documenting burnout increasing the risk for this condition (Honkonen et al., 2006; Toker et al., 2012), including greater occurrence of additional physical complaints (i.e., headache, gastrointestinal problems; Kim, Ji, & Kao, 2011), related hospitalization (Toppinen-Tanner, Ahola, Koskinen, & Vaananen, 2009), and reduced quality of life (Zhang, Loerbroks, & Li, 2017). Findings from one longitudinal study revealed burnout to be a contributing risk factor for conditions such as

arteriosclerotic disease (hardening of the arteries) and hypercholesterolemia (Kitaoka-Higashiguchi et al., 2009). In addition, burnout's association with musculoskeletal conditions has also been reported (Rastgari, Nazari, & Asghari-Jafarabadi, 2015), with research showing burnout acting as both, the mediator between negative psychosocial work conditions (i.e., low job control, high job demands) and intensity of musculoskeletal disorders (Gholami, Pahlavaian, Akbarzadeh, Motamedzade, & Moghaddam, 2016), and a predictor of associated musculoskeletal pain (Armon, Melamed, Shirom, & Shapira, 2010). Also, burnout has been found to increase risk for type 2 diabetes (Melamed, Shirom, Toker, & Shapira, 2006), work related injuries (Halbesleben, 2010), and even all-cause mortality for the younger working population (age < 45; Ahola, Vaananen, Koskinen, Kouvonen, & Shirom, 2010). As these findings clearly illustrate, burnout represents an important risk factor for many physical health problems impairing workers' functioning necessary for proper and expected work performance.

Burnout and Organizational Health

Organizational health which includes organizational performance is closely associated with and dependent on the well-being of employees (Cotton & Hart, 2003). Employees who experience burnout exhibit behaviors that seriously undermine organizational processes and goals, and as a result, affect the health of organizations. One such often reported behavior is employee sickness absence (Salvagioni et al., 2017), which has been found to be especially prevalent among workers in high exhaustion (Peititta & Vecchione, 2011; Schouteten, 2016), high exhaustion-cynicism (Hallsten, Voss, Stark, Josephson, & Vingard, 2011) or high exhaustion-depersonalization state of

burnout, predicting future long episodes of sick leave. Findings indicate that burnout related absenteeism contributes to increased workload for the remaining staff and reduced quality of services and client satisfaction (Ducly, Hardouin, Seville, Anthoine, & Moret, 2015). In addition to sickness absence, workers with burnout have a higher propensity for sickness presenteeism or working while ill (Brborovic, Daka, Dakaj, & Brborovic, 2017). Studies have shown that presenteeism may further exacerbate burnout (Yildirim, Saygin, & Uguz, 2014) and decrease future general health as well as increase sickness absence (Taloyan et al., 2012).

Burnout tends to affect workers' job satisfaction (Pico & Mihalka, 2017; Tarcan, Tarcan, & Top, 2017), that is important to organizational health due to its link with motivation (Ismail & Razak, 2016; Sartono & Adhanni, 2015) and productivity (Oswald, Proto, & Sgroi, 2015; Santoso & Kulathunga, 2016). Research has shown that job satisfaction tends to decrease with higher levels of burnout, and especially with heightened emotional exhaustion (Piko & Mihalka, 2017; Tarcan, Tarcan, & Top, 2017; Yorulmaz, Colak, & Altinkurt, 2017). In addition, burned out and discontent with their jobs workers are more likely to entertain the possibility of leaving their employer (Jiang et al., 2017; Mullen, Malone, Denney & Dietz, 2018). Some workers with burnout terminate employment permanently, which has been the case in Finland where burnout was found to predict new cases of work disability (Ahola et al., 2009; Ahola, Toppinen-Tanner, Huuhtanen, Koskinen, & Vaananen, 2009).

Other burnout associated outcomes affecting organizational health include employee deviance, also referred to as counterproductive work behaviors (CWB), that

can be directed toward the workplace (i.e., taking excessive breaks, stealing from the company) or individual employees (i.e., verbal abuse, showing favoritism) (Bennett & Marasi, 2016). Research has demonstrated a link between burnout and CWB (Onuoha, 2013), with higher levels of burnout increasing frequency of such behaviors (Smoktunowicz et al., 2015). Although reports of specific burnout related CWB costs do not exist, they are significant, costing American organizations over \$1 trillion per year (Banks, Whelpley, Oh, & Shin, 2012).

Taken together, the above findings clearly illustrate that burnout has far reaching effects and consequences for individual workers, employers, and society at large.

Considering burnout's negative impact, pervasiveness across diverse sectors, and high prevalence, there is a great need for prevention and alleviation of this syndrome.

Although the literature has generated substantial evidence for the burnout to illness path, much more attention should be given to understanding the passage from stress/burnout to good health. Thus, identifying the very factors involved in the stressor-strain relationship is imperative as it may help illuminate potential buffers. Focusing exclusively on the work content, the JDC model identifies such important protective variables, and thus seems well suited for gaining insight into how worker's health may be improved as well as shielded from burnout.

Theoretical Framework

The Job Demand-Control Model of Occupational Stress

Since the introduction of burnout into the research domain, various causal models have been proposed and tested such as the person-fit model (McGrath, 1970), the

transactional stress framework (Lazarus & Folkman, 1984), or more recently, the areas of work life (AW) model (Leiter & Maslach, 1999). None, however, have been as systematically evaluated as the JDC model (Karasek, 1979), which has served as a platform for and dominated much of empirical research exploring the link between occupational stressors and workers' mental/physical health (Kain & Jex, 2010). As an occupational stress theory, and similarly to the other frameworks, the JDC model promotes the notion of imbalances between the person and resources within his or her environment as a major source of strain, including burnout (Karasek, 1979).

In accordance with the JDC model, an individual is seen as being connected to his or her work environment, which produces job demands that must be balanced with adequate resources to facilitate adaptation. Job control, also described as a job decision latitude, represents the main resource in the JDC theory. It refers to worker's autonomy or control over work tasks which are operationalized with measures of decision authority and skill discretion. Job demands represent the second psychosocial variable in the model and refer to work stressors of psychological or physical nature, which are assessed with a measure of quantitative workload (e.g., work conflict or time pressure). The central proposition of the JDC model is that job decision latitude protects the worker from the experience of job strain by attenuating the health damaging effects of high job demands (Karasek, 1979; Karasek & Theorell, 1990; Theorell & Karasek, 1996).

The Job Demand-Control Model: Two Distinct Propositions

The JDC model (Karasek, 1979; Karasek & Theorell, 1990; Theorell & Karasek, 1996), as depicted in Figure 1, proposes that jobs characterized by high demands and low

decision latitude (or control) will have the most deleterious effect on worker's psychological and/or physical health and represent *high strain jobs*. On the other hand, jobs identified as low in demands and high in decision latitude will have much less of a negative impact on worker's psychological and/or physical health, and thus represent *low strain jobs*. Furthermore, the model predicts that high job demands will induce strain, but also increase learning, motivation, and personal growth when accompanied by high decision latitude, and thus represent *active jobs*. In other words, work situations involving high job demands cannot be harmful to health when workers can have freedom to exercise much autonomy and make an optimal use of skills. In contrast, work situations representing low job demands and low decision latitude represent *passive jobs* and are assumed to induce stress reactions to even moderate levels of job demands, negatively impacting worker's health and even productivity (e.g., reduced work engagement; Karasek, 1979; Karasek & Theorell, 1990; Theorell & Karasek, 1996).

As evident from the model's description depicted in Figure 1, two mechanisms operate in the relationship between job demands and decision latitude: learning (exposure to high demands and high control) and strain (exposure to high demands and low control). Most of the extant research has focused on the *strain hypothesis* by looking for evidence in support of the assumption that workers' ill health is related to high-strain work conditions (Hausser et al., 2010). Another examined hypothesis which is the focus of this study is the *buffer hypothesis*, which states that control, or in Karasek's terms, job decision latitude, buffers or moderates the adverse effects of job demands on workers' well-being. The demands and control combine interactively rather than additively in their

influence on the outcome (Karasek, 1979; Karasek & Theorell, 1990; Theorell & Karasek, 1996). This effect is observed by the presence of a two-way (demand x job control) statistical interaction. Another hypothesis often investigated is the *iso-strain hypothesis*, which asserts that jobs with high demand, low control, and added factor of low social support are most detrimental to worker health. And the fourth hypothesis is that social support moderates the adverse impact of high job demands, as seen in a three-way (demand x control x support) statistical interaction. However, workers experiencing high demands, low control, and low social support are believed to exhibit poor adjustment and to be at greater risk for ill health (Johnson & Hall, 1988). Based on prior research, support was later added as a second moderating variable in the JDC model and accepted by Karasek as being an important resource for employees, thus forming the job demand-control-support (JDCS) model (Hausser et al., 2010).

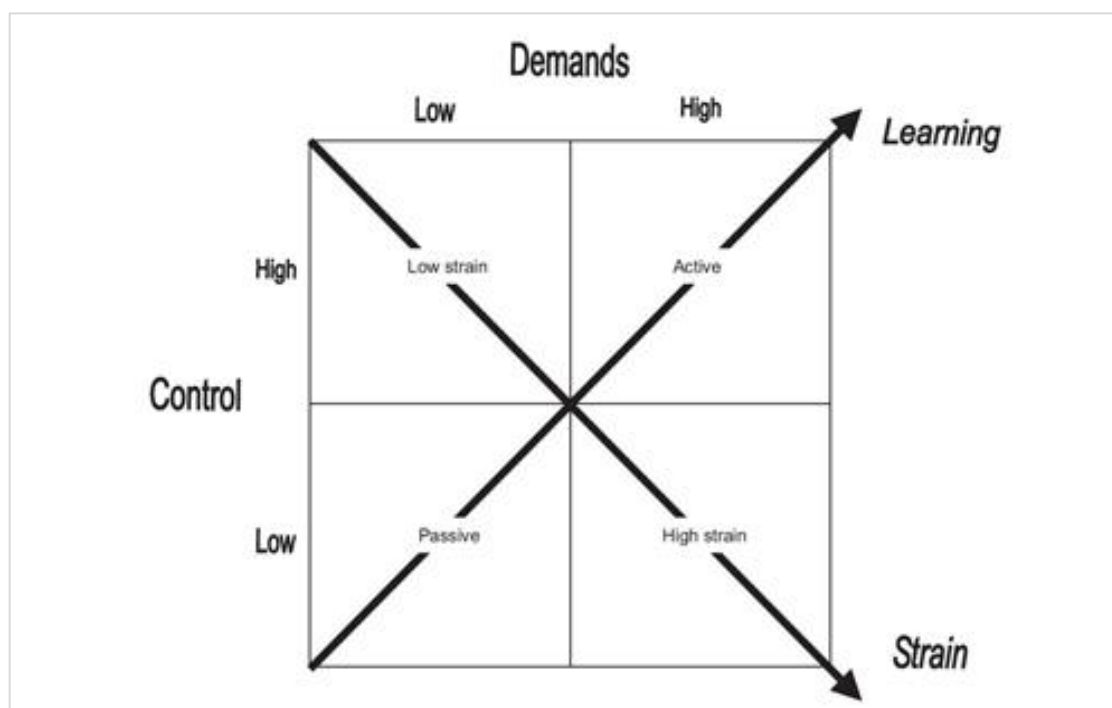


Figure 1. The job demand-control model (originated from Karasek, 1979).

Practical and Theoretical Implications of the Additive and Interactive Effects

The strain and the buffer hypotheses have important practical implications. The buffer hypothesis that predicts a statistical interaction between demand and control in affecting diverse forms of strains, if valid, would suggest that increasing workers' control over their tasks without reducing the level of demands may be sufficient to create a healthier work environment. This strategy of increasing control, however, would not work in case of control and demand, (and support) being associated additively. That is, increased control may help reduce the level of job strain, but the strain will remain elevated as the demands will continue being high, adversely impacting worker's health (Hausser et al., 2010; van der Doef & Maes, 1999).

Interestingly, Karasek (1989) has argued that the presence of a statistical interaction is not necessary for demonstrating the model's value for job redesign. In defending his position on the subject, he states that "The primary 'interaction' claimed in this model is that two separate sets of outcomes are jointly predicted by two different combinations of psychological demands and decision latitude—an interaction of significant practical importance" (Karasek, 1989, p. 143). Other authors (e.g., Beehr, Glaser, Canali, & Wallwey, 2001; Hausser et al., 2010; Kain & Jex, 2010; van der Doef & Maes, 1999), however, have strongly disagreed. For instance, Beehr et al. (2001) has contended that the nature of interaction between job demand and job control in predicting strain is of significance not only for practical reasons, but also theoretical. More specifically, if the additive or main effects of demand and control are all that makes the theory, then these components may simply represent independent and not necessarily

associated constructs, negating the very propositions of the JDC model. Thus, confirming the buffer hypotheses has both, practical and theoretical implications.

Buffering Role of Control in the Job Demand-Strain Relationship

The JDC model's main hypotheses have been tested across a range of different populations and outcome measures. Karasek's (1979) seminal work on the model generated supportive evidence for the joint interactive effects of demands and decision latitude. Using representative samples of American and Swedish male employees, the researcher found that the demand-decision latitude interaction predicted exhaustion, job and life dissatisfaction, depression, number of sick days, and use of sedatives. Karasek and colleagues (Karasek et al., 1988) obtained additional empirical support for the buffer hypothesis with physiological health outcomes. The data from national health surveys showed that after controlling for age and other confounding factors, the myocardial infarction prevalence was higher among workers in positions characterized by synergistically combined high job psychological demands and low decision latitude. Other early research, however, showed no support or partial support for the interaction effects. Landsbergis (1988), for instance, found additive rather than interactive effects of control and demand when examining mental health outcomes (i.e., burnout) in a sample of health workers. And Xie's (1996) study with a sample of Chinese white-collar and blue-collar employees provided support for control moderating the effects of job demands in terms of anxiety and depression, but only for the white-collar participants. No such interaction effects were detected for blue-collar workers and interestingly, higher control exacerbated the negative effects of job demands.

Evidence From Systematic Reviews

As illustrated above, this emerging pattern of inconsistent findings produced by early studies on the JDC model seems to characterize the whole body of such inquiries. For instance, an extensive literature review on the JDC and JDCS models and psychological health conducted by van der Doef and Maes (1999) covering a period from 1979 to 1997 revealed that in general, findings supported the strain and iso-strain hypotheses, but evidence for the buffering effects of control was equivocal. Out of the 31 studies evaluated, 48% demonstrated partial support for the interactive effects of control on various health outcomes (e.g., depression, anxiety, life satisfaction). Another review of research on the models examining diverse mental and physical health outcomes published between 1999 and 2000 was performed by de Lange et al. (2003) and focused exclusively on longitudinal research which was vetted for methodological quality. The analysis demonstrated that only 42% (8 out of 19 studies) generated support for the additive and interactive effects of the JDCS model, but the additive effects were more evident. More recently, Hausser et al. (2010) review of cross-sectional and longitudinal studies published between 1997 and 2007 that tested the JDC and JDCS models' main hypotheses in terms of psychological well-being revealed a similar trend. Support for the strain hypotheses dominated in cross-sectional studies, with 39% (11 out of 28) reporting interactive effects of the JDC model and 21% (3 out of 14) of the JDCS model. Moreover, systematic reviews of research on JDC and JDCS models focusing on various physical health outcomes (e.g., cardiovascular disease, psychosomatic complaints, musculoskeletal symptoms, mortality, morbidity) conducted during eighties and nineties

have reached similar conclusions, as noted in generally reported support for the additive effects with sparse in comparison evidence for the buffer hypotheses (Kristensen, 1995; Schnall, Landsbergis, & Baker, 1994; van der Doef & Maes, 1999).

Evidence From Cross-Sectional and Longitudinal Research

More recent research inquiries examining the JDC and JDCS models' main and interactive effects seem to demonstrate a trend brought to light by earlier investigations. In general, research supports the additive effects of the models' components (Fagerlind, Gustavsson, Johansson, & Ekberg, 2013; Holman, 2013; Igit et al., 2017; Keller et al., 2017; Luchman & Gonzalez-Moralez, 2013; Zeng et al., 2014) while the findings for the buffer hypotheses continue being scarce and inconsistent (Baba, Tourigny, Wang, Lituchy, & Monserrat, 2013; Negussie & Kaur, 2016; Pesseau et al., 2014; Tucker et al., 2008; Weigl, Hornung, Petru, Glaser, & Angerer, 2012). For example, Weigl et al. (2012) in a prospective cohort study investigated the relationship between the dimensions of JDCS model and depressive symptoms among junior physicians ($N = 1,000$). The data analysis showed no significant two-way (work overload x job autonomy; work overload x professional support) or three-way (work overload x job autonomy x professional support) interaction effects on depressive symptoms. Greater autonomy, however, had a negative relationship with depression. In another inquiry, focusing on distress among other outcome variables, Pesseau et al. (2014) tested the JDC model's buffer hypothesis using a large sample of $N = 2,079$ nurses and administrators from United Kingdom primary care settings. The researchers distinguished between individual and environmental features of job characteristics to prevent possible confounding. The

analysis failed to confirm the job demand and control interaction in predicting distress, as posited by the JDC model. In particular, perceptions of control and demand were found to independently predict distress levels providing support for the model's main effects, but control moderated the relationship between demands and distress by reducing the effects of low not high demands, a finding in clear opposition to the buffer hypothesis. In another study, Negussie and Kaur (2016) investigated the relationship between JDCS model's dimensions and job satisfaction, an indicator of well-being, in a sample of nurses ($N = 360$). The analysis showed that job control failed to moderate the job demands and job satisfaction relationship. Also, no synergistic three-way interaction was observed among job control, job demand, and social support. Thus, the buffering effect of control in the job demand - job satisfaction relationship was not supported. Job support alone, however, emerged as a moderator of the job demands and job satisfaction relationship.

Similar results have been obtained by Baba et al. (2013) who examined the additive and interactive effects as proposed by both the JDC and JDCS using culturally diverse samples of nurses from Japan, China, Argentina, and the Caribbean (total $N = 1,346$). The data analysis revealed that while the models' components can be used to explain the experience of nurses' stress in culturally diverse work environments, they may operate differently in different contexts and not always in the expected form or combination. A significant two-way (demand x control) interaction was found in the Japanese sample only that high job control moderated the adverse impact of low and moderate and not high levels of job demands, thus failing to validate the buffer hypothesis of the JDC model. Interestingly, a two-way interaction between job control

and job support on stress was found in the Chinese sample indicating that availability of the two resources (high job support and high supervisory support) buffered against stress. The buffer hypothesis of the JDACS model as seen in a three-way interaction (demand x control x support) was fully validated in all samples but not the Caribbean. In the Caribbean sample, only additive effects of the JDACS components were detected. High job control was found to moderate the influence of demands on stress when supervisory support was low in the Japanese nurses only.

Recently, workplace bullying which is considered a symptom of high-strain work has received attention in the occupational research domain (Baillien, Rodriguez-Munoz, de White, Notelaers, & Moreno-Jimenez, 2011; Francioli et al., 2016; Goodboy, Martin, Knight, & Long, 2017). Such investigations have produced results in support of job control moderating the relationship between demands and workplace bullying. For instance, researchers Goodboy et al. (2017) investigated the relationship between JDACS model's components and workplace bullying in a sample of $N = 314$ employees from diverse organizations. In addition to establishing the additive effects of high demands, low control, and low supervisor social support on perceived greater workplace bullying (the iso-strain hypothesis) a three-way interaction among job demands, control, and supervisor social support was observed in predicting the outcome. More specifically, in work environments with reduced social support, high worker control moderated the high work demands and workplace bullying association. Similar results were obtained by Baillien et al. (2011) who evaluated the main and interactive effects of control using a sample of workers from Spain ($N = 276$) and Belgium ($N = 319$). The results

demonstrated that for workers in both samples, high workload (or job demands) and work autonomy were positively associated with workplace bullying (additive affects) and high autonomy buffered the negative effects of high workload on workplace bullying (interactive effects).

Evidence From Epidemiological Research

In contrast to the above findings, the evidence supporting the JDC and JDCS models' buffer hypotheses in recent epidemiological research is lacking (Padyab, Blomstedt, & Norber, 2014; Poorabdian, Mirlohi, Habib, & Shakerian, 2013; Schioler, Soderberg, Rosengren, Jarvholm, & Toren, 2015; Shirom, Toker, Berliner, & Shapira, 2008; Shirom, Toker, Alkaly, Jacobson, & Balicer, 2011; Tobiasz-Adamczyk, Brzyski, Florek, & Brzyska, 2013). For instance, Schioler et al. (2015) investigated longitudinally the association between work characteristic of the JDC model and risks of coronary heart disease (CHD) and ischemic stroke in a sample of $N = 75,236$ Swedish male construction workers. The results showed that demands and control had no additive or interactive impact on the examined outcome variables despite an observed trend of high demands and low control among the workers, including a high incidence of CHD and stroke in a relatively young population (for ischemic stroke, the mean age at onset was 59.3 and for CHD, the mean age at onset was 58.1). In another study, Padyab et al. (2014) using a large prospective cohort of Swedish health survey participants ($N = 74,988$) found no support for the synergistic relationship between high job demands and low job control and between these factors and social support, as proposed by the JDC and JDCS models', respectively, in prediction of cardiovascular mortality.

Among various conventional risk factors, education was detected as the most significant predictor of cardiovascular mortality. Interestingly, job control on its own as well as in combination with low support was found to represent a significant risk for cardiovascular disease. Also, a main effect of outside, but not work social support was found in that it attenuated the influence of low demands on the risk for cardiovascular mortality for women only.

In research focusing on musculoskeletal health outcomes, there appears to be more support for the independent contributions of the JDC and JDCS models' components to the examined outcomes rather than their interactions (Canjuga, Laubli, & Bueer, 2010; Cantley, Tessier-Sherman, Slade, Galusha, & Cullen, 2015; Larsman & Hanse, 2009; Lourenco, Carnide, Benavides, & Lucas, 2015). For example, Cantley et al. (2015) assessed longitudinally the relationship between the JDC model's components and the risk for workplace injury and musculoskeletal disorder (MSD) using a sample of $N = 9,260$ aluminum manufacturing workers. Adjusting for job-level physical demands, the results indicated no significant interaction effects between demand (psychological and physical) and job control on the examined outcomes. Job control, psychological and physical demands were identified as independent predictors of workplace injury and MSD. In another earlier investigation, Canjuga et al. (2010) found no significant job control and demand interaction effect on back and neck pain in a sample of $N = 1,040$ Swedish workers. The results showed a partial support for the JDC model in that high physical and psychological demands independently predicted the examined musculoskeletal symptoms. Although rare, some investigations have generated support

for the buffer hypothesis of the JDCS model demonstrating that support attenuates the negative impact of high strain (high demands and low control) on specific musculoskeletal symptoms (Larsman & Hanse, 2009; Lourenco et al., 2015).

Evidence From Experimental Research

In contrast to the great volume of cross-sectional and longitudinal research testing the validity of the JDC/JDCS models, experimental reports are scarce, but the reported findings are similarly inconsistent (Cendales-Ayala, Useche, Gomez-Ortiz & Bocarejo, 2017; Hausser, Schulz-Hardt, & Mojzisch, 2014; Hausser, Mojzisch, & Schulz-Hardt, 2011; O'Donnell, Landolt, Hazi, Dragano, & Wright, 2015; Subhani, Malik, Kamel, Saad, & Nandagopal, 2015). For instance, Subhani et al. (2015) examined the influence of control on cognitive arousal in a sample of healthy female participants. The demand was manipulated by varying the task difficulty and control by the amount of time to complete the task (i.e., mentally solve arithmetic problem while receiving stressful feedback). The findings indicated that participants had the highest arousal and lowest performance in conditions of low control and high demands. Also, those exercising high control showed significantly lower arousal and better performance. As these results illustrate, the data validated the buffer hypothesis. In another study, O'Donnell et al. (2015) used a within-group experimental design to investigate the buffering effect of control on demands in a sample of female university students. Control was operationalized as autonomy and manipulated by randomly assigning the subjects to either autonomy (freedom to choose a break) or standard (assigned breaks) conditions while holding the demands (time pressure) constant. The objective assessment of stress was performed using indicators of

salivary alpha amylase (sAA) and heart rate variability (HRV). The results showed that relative to standard condition, increased autonomy was associated with greater stress, reduced performance and no changes to the level of perceived demands. Thus, the data failed to support autonomy as a buffer and actually suggested that it may be a potential stressor.

Evidence From Research Focusing on Burnout as the Outcome

The burnout phenomenon has also been investigated in the context of the JDC and JDCS models. Tests of main and interactive effects seem to mainly focus on the distinct burnout dimensions of emotional exhaustion, depersonalization, and personal accomplishment, as originally defined and measured by Maslach (Maslach et al., 2001). While there appears to be substantial evidence for the main or additive effects of the models' components on burnout's features (Adriaenssens, de Gucht, & Maes, 2015; Aronsson et al., 2017; Pisanti, van der Doef, Maes, Lazzari, & Bertini, 2011; van Doorn et al., 2016; Wong & Spence Laschinger, 2015) with some exceptions (e.g., Pisanti et al., 2016), the evidence for interactive (or buffering) effects is generally lacking, as seen in recent investigations (Konze, Rivkin, & Schmidt, 2017; Melamed, Armon, Shirom, & Shapira, 2011; Pisanti et al., 2015; Pisanti et al., 2016; Wood et al., 2011).

For instance, Pisanti et al. (2015) failed to generate support for the interactive effects of the JDCS components on burnout. The data deriving from a sample of $N = 1,479$ nurses revealed no significant two-way (demands x control and demands x social support) or three-way (demands x control x support) interactions. Job demands, control, and social support, however, were observed to additively predict emotional exhaustion

and depersonalization, but not personal accomplishment, the third dimension of burnout. Similar results were reported by Pisanti et al. (2016) who used a two-wave panel study to investigate the link between job characteristics of the JDCS model and occupational burnout in a sample of $N = 287$ nurses. The researchers did not find significant two-way (demands x control and demands x social support) or three-way (demands x control x social support) interaction on predicting burnout variables (emotional exhaustion, depersonalization, personal accomplishment) as evaluated at Time 2; thus, the results failed to support the buffering effects.

Additional evidence of null findings can be found in a study by Wood et al. (2011) who tested the additive and interactive effects of JDCS components on various mental health outcomes, including burnout. The researchers used data from $N = 1,870$ mental health employees and performed five tests of two-way interactions and two tests of three-way interactions. Although the interaction effects among the components were generally weak, the analysis showed control and support independently attenuated the effects of high demands on anxiety and depression and control reduced the effects of demands on intrinsic satisfaction. There were no significant two or three-way interactions found for emotional exhaustion and depersonalization.

Konze et al. (2017) in a longitudinal study using a sample of $N = 139$ workers from an energy producing facility found mixed findings. In examining the relationship between JDC components and emotional exhaustion over a period, the researchers focused on the interaction of control with two different types of demands which were quantitative workload and emotional dissonance. Interestingly, the data showed that job

control buffered against quantitative workload, but not against emotional dissonance. This finding suggests that job control may not always be beneficial and that it may have a detrimental effect on workers' mental health, depending on the type of demand they are exposed to. While this study offers a plausible explanation for the inconsistent findings found in the extant literature examining the buffering role of control, caution should be exercised when generalizing due to clear methodological limitations (e.g., small sample size, participants from a single occupational setting) and lack of other similar investigations. Nevertheless, the results suggest a far more complex and dynamic relationship among the examined work characteristics than that proposed by the JDC model, which has also been recognized by scholars noting the model's main limitations and suggesting theoretical refinements.

Models' Main Limitations and Proposed Theoretical Revisions

The inconsistent support for the JDC/JDCS models' buffer hypotheses has evoked some criticisms from several authors (e.g., Hausser et al., 2010; Kain & Jex, 2010; van der Doef & Maes, 1999), from which some major limitations can be gleaned. One of the most commonly expressed criticisms pertains to the conceptualization and operationalization of the models' key components. The job demand (or stressor) variable, with some exceptions (e.g., Konze et al., 2017), has been commonly defined and measured as workload or time pressure. Research, however, has since provided evidence for stressors constituting two broad dimensions, namely, challenges and hindrances (LePine, LePine, & Jackson, 2004), thus greater specificity in the measurement of demands may need to be employed.

The second concern relates to the model being exclusively focused on environmental factors as determinants of strain/health and neglecting to account for likely influential individual difference variables (i.e., dispositions) (Hausser et al., 2010; Kain & Jex, 2010; van der Doef & Maes, 1999). Although Karasek (1979) has acknowledged the importance of individual differences, including personality as playing a role in the job stress process, his model focuses mainly on environmental conditions. Most of the extant research has examined JDC/JDCS models in their original form without considering dispositional or other person characteristics. The stress literature, however, paints a more complex and dynamic stressor-strain relationship in which both person and environmental factors play a role in adjustment to stressors (e.g., Gyorkos, Becker, Massoudi, de Bruin, & Rossier, 2012; Zurlo et al., 2016) with dispositions exerting a moderating influence on the stressor-strain relationship (e.g., Rubino, Perry, Milam, & Spitzmueller, & Zapf, 2012; van Doorn & Hulsheger, 2015).

Considering the above limitations, it is being argued that to increase chances of finding buffering effects in the original JDC model, two theoretical refinements are in order: one at the environmental level, which involves more specific classification of demands and one at the person level, which encompasses inclusion of dispositions as secondary moderating variables. By incorporating tenets of the challenge-hindrance model (Cavanaugh et al., 2000) and being guided by findings from relevant research, it is proposed that the JDC model should focus on hindrance type of demands. Furthermore, using the transactional stress framework (Lazarus & Folkman, 1984) and the differential reactivity theory of personality theory (Bolger & Zuckerman, 1995), including pertinent

research, it is suggested that the interaction effects are more likely to occur by inclusion of dispositional factors such as LOC and mindfulness. The emphasis on person-environment relationship as contended by the transactional stress framework and especially the process of cognitive appraisal will serve as the main theme integrating the selected theories, supporting the rationale for the proposed theoretical changes to the JDC model in a test of the buffer hypothesis in the present inquiry.

The Transactional Stress Framework

Building on the work of Arnold (1960), Lazarus and Folkman (1984) devised the transactional stress framework which proposes a view of stress/strain as being the result of a dynamic person-environment relationship or transaction, in which environmental conditions (e.g., job demands) are perceived as taxing person's resources necessary for an adaptive response. The main thrust of this model is its process like orientation characterized by an individual constantly engaging in two types of evaluative processes, namely, primary appraisal and secondary appraisal. The primary appraisal can be in a form of harm/loss, threat, or challenge and involves people continuously evaluating the situation in terms of its significance or meaning, such that a threat, for instance, may alert individuals to future harm, assisting in most adaptive response and a challenge may mobilize them to face and cope with a demanding issue. Coping, which characterizes the secondary appraisal in turn can be problem-focused, facilitating action or emotion-focused, which may involve cognitive reappraisal or denial and distancing from the problems being faced. Cognitive appraisal and coping are deemed as mediators of the stressor-strain relationship (Lazarus, 1966; Lazarus and Folkman, 1984).

Cognitive appraisal represents an important factor in the stress experience and points to individual differences in stress response and adaptation (i.e., coping). While work stressors may be objectively the same, people are likely to differ in how they experience and cope with them (Lazarus & Folkman, 1984). This assertion has been supported empirically, with research demonstrating the mediating role of cognitive appraisal (Gomes, Faria & Lopes, 2016; Gomes et al., 2013; Kozusznik, Peiro, Oriano, & Navarro Escudero, 2018; Paskvan, Kubicek, Prem, & Korunka, 2016) and coping (secondary appraisal) (Brough, Drummond, & Biggs, 2018; Gaudioso, Turel, & Galimberti, 2017; Schantz & Bruk-Lee, 2016) in a relationship between various work stressors and strain outcomes, including burnout.

To illustrate, Gomes et al. (2013) and Gomes et al. (2016) examined the role of appraisal in psychological strain and burnout, respectively. The data from both studies confirmed the differential relationship between the two types of appraisals and mental health, as posited by the transactional stress model. A positive relationship was observed between threat perception and poor mental health and negative relationship between challenge perception, control perception, coping potential and mental health problems. Also, appraisals (primary and secondary) partially mediated the relationship between work stress and both types of strain. Similar results were reported by Brough et al. (2018) who examined the mediating role of coping in the context of the JDCS model (Johnson & Hall, 1988). The results showed that coping mediated the effects of demands on psychological strain. Participants using avoidance coping to manage cognitive work

demands (i.e., monitoring demands) experienced greater psychological strain, especially when supervisor support was perceived as low.

In sum, the results denote the mediating effect of appraisal on a stressor-strain relationship. Clearly, and as posited by the transactional stress perspective, both person (i.e., individual's perception and appraisal of stressors) and environment specific (i.e., job demands and job control) factors play a role in the stress experience and adaptation. Thus, both such factors are important to consider in tests of the JDC/JDCS theory.

The Challenge-Hindrance Model

The JDC/JDCS occupational stress models (Karasek, 1979; Johnson & Hall, 1988) consider individual's perception of stressors and resources, however, they espouse a common view of stress/stressor as being negative not only in perception, but also in appraisal and experience (i.e., coping). However, stress is not always deleterious and may be beneficial in terms of motivating an individual to cope with a threat by responding adaptively, as in Cannon's (1929) "fight or flight" reactions, for example (pp. 215-230). Similarly, in our experiences with what Lazarus (1999) calls "daily hassles" (p. 56), which include work stressors (i.e., job demands), the threat or challenge stress appraisals may mobilize our coping efforts, facilitating adjustment. The challenge-hindrance model (Cavanaugh et al., 2000) recognizes such positive aspects of stress by drawing from the transactional stress framework (Lazarus and Folkman, 1984) and the works of Selye (1976) who made a distinction between good and bad stress, or eustress and distress, respectively. In particular, the theory considers the fulfilling nature of eustress associated

with challenge stress appraisals and the goal thwarting character of distress related to hindrance stress appraisals.

The challenge-hindrance model (Cavanaugh et al., 2000) proposes a two-dimensional taxonomy of stressors, namely, those that are typically appraised as challenges and those appraised as hindrances. Challenge stressors (i.e., time pressure, workload, job scope) are believed to be work demands that despite their stress inducing properties, offer potential for goal attainment and professional development. Hindrance stressors (interpersonal conflict, role conflict, and organizational politics), on the other hand, are regarded as work demands which constrain or limit goal achievement (Lepine, Podsakoff, & Lepine, 2005; Podsakoff, LePine, & LePine, 2007).

A substantial body of research has generated support for this dual dimensionality of stressors and their proposed differential effect on various work outcomes such as work engagement and its indicators (Liu & Shi, 2010; Tadic, Bakker, & Oerlemans, 2015), supervisor/organizational support (Haar, 2006), job satisfaction (Gardner & Fletcher, 2009; Webster, Beehr, & Christiansen, 2010), burnout (i.e., cynicism and inefficacy) (Yao, Jamal, & Demerouti, 2015), as well as other forms of strain (i.e., depression, anxiety) and psychological resilience (Crane & Searle, 2016). The findings support the validity of the challenge-hindrance model by demonstrating that hindrance type of stressors are associated with negative outcomes and those of challenging nature with positive ones. This research clearly highlights the important role of evaluation of stressors, or their appraisal in adjustment, as posited by the transactional stress framework (Lazarus & Folkman, 1984).

The Challenge-Hindrance Model in the Context of Job Demand-Control-Support Theory

The challenge-hindrance typology has recently been applied in research testing the validity of the JDC/JDCS theory's central predictions, including their respective buffer hypotheses (Dawson et al., 2016; Cheung, Sinclair, & Wang, 2015). As mentioned earlier, the JDC/JDCS model does not differentiate among stressors or job demands as either challenging or hindering. Karasek's (1979) conceptualization of job demands as workload denotes a negative type of stressor. However, from the dual stressor framework perspective, such a stressor is considered to have a challenging rather than hindering quality (Cavanaugh et al., 2000). Based on research demonstrating differential effect of challenge and hindrance demands on various work outcomes, the nature (or type) of the demand may need to be accounted for in tests of the JDC/JDCS models buffer hypotheses and may potentially help explain the unsupportive findings in the extant literature. In fact, several authors (e.g., de Jonge, Van Vegchel, Shimazu, Schaufeli, & Dormann, 2010; Hausser et al., 2010; Kain & Jex, 2010; Konze et al., 2017) have criticized JDC/JDCS models for the way their main components are conceptualized and operationalized, suggesting that this may be an important factor in the null results.

To date, only three research studies (Cheung et al., 2015; Dawson et al., 2016; Schaubroeck & Fink, 1998) have integrated the tenets of the challenge-hindrance stressor framework in the JDC/JDCS theory. Overall, this research supports the value of the two-dimensional stressor framework (i.e., workload tends to be appraised as a challenge type of demand), but more importantly, points to the nature of stressor as a boundary condition

for JDC and JDCS models. As found by Cheung et al. (2015) who focused on the JDC model and Schaubroeck and Fink (1998) who examined the JDCS model, the buffering effects of control and control and support, respectively, are more likely to be found for demands classified as hindrances, but not as challenges. The recent, longitudinal test of the JDCS model conducted by Dawson et al. (2016) demonstrates such a boundary condition exceptionally well. In this study, a sample of $N = 228$ employees from diverse occupational fields was used to test for JDCS model's interactive effects on job associated emotional exhaustion, physical symptoms, and anxiety. The results showed a three-way interaction effect involving hindrance type of demands (i.e., interpersonal conflict, role conflict, and organizational politics), but no such effects were found for challenge type of demands (i.e., workload, time pressure) in predicting anxiety and physical health. Contrary to predictions made, however, no significant three-way interaction including hindrance demands was found for the strain variable of emotional exhaustion. The researchers speculated that the time leg of four weeks was too brief to reveal anticipated effects.

As the research findings by Dawson et al. (2016) and others (Cheung et al., 2015; Schaubroeck & Fink, 1998) suggest, future tests of JDC/JDCS models' buffer hypotheses may need to focus on hindrance rather than challenge type of stressors or demands. This may increase chances of finding interaction effects considering that in most studies examining JDC/JDCS models, job demands have been conceptualized and operationalized as challenge type of stressors. Thus, failure to properly differentiate

between two types of stressors may be the reason behind the null results for interactive effects plaguing the JDC/JDCS literature.

Limitations of the Challenge-Hindrance Model

While the dual stressor typology is based on the principles of cognitive appraisal, as posited by the transactional stress perspective (Lazarus & Folkman, 1984), it seems to reduce appraising to a heuristic like process, neglecting to consider that the degree of perceived challenge or hindrance may be influenced by a host of other person variables such as certain beliefs or dispositions. As stated by Lazarus (1993), the process of appraisal may be affected not only by factors in the environment, but also those within the person, which together shape the stress reaction. In fact, research has demonstrated moderating effects of certain personalities (e.g., conscientiousness, neuroticism) on the relationship between both type of stressors and strain/behavioral responses in that the associations are found to be stronger or weaker depending on the level of a particular trait (e.g., Lin et al., 2015; Rodell & Judge, 2009; Tai & Liu, 2007; Zhu et al., 2017). For example, Rodell and Judge (2009) found that personality trait of neuroticism characterized by high emotional reactivity to moderate the relationship between hindrance stressors and anger. The strength of the stressor-anger relationship was dependent on the level of neuroticism, such that it was stronger for workers with high level of this attribute. In another study, personality trait of conscientiousness which is associated with a goal-oriented behavior was found to moderate the relationship between both challenge and hindrance stressors and mental strain in that the positive stressor-strain association was stronger for individuals high and not low in conscientiousness.

Also, high conscientiousness moderated the challenge stressor and performance association. These sample findings illustrate that personality dispositions may exert a moderating influence on the stressor-strain link. Thus, although there may be merit in differentiating among the types of stressors (or job demands), attention must also be given to influential individual difference variables such as personality.

Differential Reactivity of Personality Theory

The transactional stress framework emphasizes the interdependent relationship between the individual and his or her environment, but the role of person variables of dispositional character in appraising of stressors is rather minimized. While Lazarus (1961; Lazarus & Folkman, 1984) acknowledges that traits similarly to situational factors may color perception and appraisals, he asserts that personality dispositions oversimplify the complex relationship between people and the environment. Personality literature demonstrating the impact of various traits on appraisal and coping leading to either adaptive (e.g., Bartley & Roesch, 2011; Connor-Smith & Flachsbart, 2007; Karimzade & Besharat, 2011; Schneider et al., 2012; Zhang, 2012) or maladaptive stress responses (e.g., Carver & Connor-Smith, 2010; Cash & Gardner, 2011; Kaiseler, Polman, & Nichols, 2012; Tong, 2010; Kaur, Chodagiri, & Reddi, 2013; Polman, Borkoles, & Nicholls, 2010; Sahin, Basim, & Akkoyun, 2011; Williams & Wingate, 2012; Zurlo et al., 2016), however, suggests that both personality of an individual and situational contingencies need to be considered in order to more fully understand this relational complexity. This trait and process (i.e., appraisal) association is well captured by the framework proposed by Bolger and Zuckerman (1995) in which personality affects

person's exposure or reactivity to environmental stressors, or both, including the coping response. The model's differential reactivity prediction, in particular, is of special interest to this inquiry as it posits that personality may exert a moderating influence on stressors (or job demands), leading to variable health outcomes. More specifically, this influence is dependent on the level (high, low) of a particular personality attribute, which helps to either mitigate or exacerbate negative response to stressors, protecting some individuals, while increasing vulnerability to strain effects for others.

Initial research by Bolger and Zuckerman (1995) and subsequent studies (e.g., Ceschi, Sartori, Dickert, & Constantini, 2016; Garrosa, Moreno-Jimenez, Rodriguez-Munoz, & Rodriguez-Carvajal, 2011; Loi, Liu, Lam, & Xu, 2016; Nauta, Liu, & Li, 2010; van Doorn & Hulsheger, 2015) have generated support for the moderating effects of various personality dispositions and styles on the stressor-strain relationship across a broad range of occupational groups and outcomes. For example, Garrosa et al. (2011) using a sample of nurses ($N = 508$) found that optimism moderated the relationship between role stress (e.g., workload, role ambiguity) and the dimensions of burnout and engagement. Unlike nurses with low levels of this attribute, those scoring high had a more positive outlook/expectations which was demonstrated to buffer against the effects of high stress. In another study, using two diverse samples of professionals ($N = 68$ and $N = 172$) van Doorn & Hulsheger (2015) found that core self-evaluations, a trait comprised of self-efficacy, self-esteem, locus of control, and emotional stability exerted a moderating effect on the relationship between various work stressors and psychological distress (i.e., depression, irritation). While high levels of this personal resource buffered

against health damaging stressors, low levels were associated with greater susceptibility to stressor effects. These results support the differential reactivity theory, and the notion that personality dispositions have an important role in the person-environment interaction, contrary to Lazarus's views.

Differential Reactivity of Personality Theory in the Context of Job Demand-Control-Support Theory

To recall, the JDC/JDCS theory has been criticized for being exclusively focused on the work environment and failing to account for important person variables (Hausser et al., 2010; Kain & Jex, 2010; van der Doef & Maes, 1999). While the transactional stress perspective downplays the role of dispositional characteristics, the differential reactivity theory and research, as presented earlier, clearly illustrates that in addition to organizational factors, personality factors may act as moderators of the stressor-strain association. In the context of JDC/JDC models, such a moderating effect can be observed when the detrimental effect of job demands on health/other strain outcomes occurs only during the condition of low job control and high or low level of a particular disposition. In other words, personality represents a conjunctive moderating variable, or a variable that exerts additional moderating influence on the effect of the primary moderator (i.e., job control), as in the JDC model or on both the primary and the secondary moderator (i.e., support), as in the JDCS model (Terry & Jimmieson, 1999). Statistically, in the JDC model, this effect is represented by a three-way, job demand x job control x disposition interaction and in the JDCS model, by a four-way, job demand x job control x support x disposition interaction (Hausser et al., 2010).

The possibility of personality moderating the job demand-control dimensions has been explored empirically, but such research is quite limited. Some findings offer partial support for the expected predictions (e.g., Francioli et al., 2016; Panatik, O'Driscoll, & Anderson, 2011), while other reports fully validate the moderating effect of select personality dispositions on the JDC model's key components (e.g., Hystad et al., 2011; Parker & Sprigg, 1999; Rubino et al., 2012; Totterdell, Wood, & Wall, 2006). For instance, Francioli et al. (2016) using a professionally diverse sample of $N = 363$ Danish employees found no moderating effects of personal disposition of sense of coherence (SOC) on JDC model's components in prediction of different forms of bullying (i.e., personal and work associated). While no three-way, work demands x job control x SOC interaction was detected, significant but of low magnitude two-way, work demands x SOC and job control x SOC interactions emerged in predicting work related and personal bullying, respectively. Thus, only partial statistical support and of low practical relevance was demonstrated for SOC as a moderator of the JDC model in terms of bullying.

More convicting evidence derives from the study by Hystad et al. (2011) who focused on the moderating role of personal hardiness in the JDC model with sickness absence as the outcome variable using a large sample of $N = 7,239$ Norwegian military employees. A significant three-way job demand x job control x hardiness interaction was observed such that for individuals high in hardiness, high control buffered against absences associated work demands. This effect of control was opposite for those with low level of hardiness as high control enhanced the effects of demands on the examined

outcome. Additional support for the moderating role of personality comes from research by Rubino et al. (2012) who found the trait of emotional stability to exert a moderating effect on the job demand-job dissatisfaction and disengagement relationship. The data deriving from two samples comprised of German human service workers (a total of $N = 698$) demonstrated statistical support for the three-way interaction between demands, job control, and emotional stability in predicting the two forms of strain. High control benefited only individuals with high levels of emotional stability, while it had a detrimental effect for those with low levels of this attribute. All in all, these findings highlight the important moderating role of personality factors in the job demand- control model, with the buffering impact being contingent on the level of a particular attribute, as posited by the differential reactivity prediction. The findings clearly support the inclusion of personality variables in future tests of the buffer hypothesis.

Locus of Control as a Potential Moderator in the Job Demand-Control Model

LOC is an enduring disposition that influences how individuals appraise and respond to environmental conditions (i.e., stressors, resources; Lefcourt, 2010). This dimension of personality, as postulated by Rotter (1966), is characterized by people's generalized beliefs or expectancies about the degree of control they have over the outcomes of certain events/situations. A person with a tendency to perceive an outcome as dependent on own capacities, behavior, or characteristics is identified as having an internal LOC and a person with the inclination of viewing it as dependent on external to him or her forces (e.g., luck, faith) is regarded to have an external LOC. The difference between the two control orientations is that the former represents a sense of self-agency

that propels one to take action in response to problems, while the latter, a sense of other-agency that renders an individual helpless and passive when facing difficult situations, delegating the responsibility for the problems to outside forces.

Unlike the control construct in the JDC model that pertains to worker's perception of control over job tasks, and which may vary according to changes in the work environment, LOC represents general beliefs in control or a stable predisposition to perceive control that generalizes across settings and time (Spector & Goh, 2001). Thus, LOC is important to perceptions of job control and can be regarded as a lens through which the worker evaluates both work resources and stressors. Indeed, research has documented LOC to be influencing cognitive stress appraisals and coping and being a factor in various strain outcomes, including burnout (Dijkstra et al., 2011; Gueritault-Chalvin, Kalichman, Demi, & Peterson, 2000; Injeyan et al., 2011; Wilski, Chmielewski, & Tomczak, 2015). As these inquiries reveal, unlike workers with external LOC, those with internal orientation tend to engage in positive evaluative judgments of stressors and use an active or problem focused coping style, allowing them to withstand the effects of stressors or demands. Such an adaptive stress response pattern, although not explicitly examined, likely relates to findings showing internal LOC being associated with less occupational stress (Crothers et al., 2010; Jagannathan, Thampi, & Anshu, 2013; Jha & Bano, 2012; Suriyakulnaayudhya, Sripongpan, & Intrawong, 2015) and greater well-being, including job satisfaction (Bhardwaj & Gupta, 2017; Gangai, Mahakud, & Sharma, 2016; Quevedo & Abella, 2014; Sharma & Juyal, 2017) and reduced burnout (Bitsadze & Japaridze, 2016; Chakraborty et al., 2012; Lovell & Brown, 2017).

Based on the above research, as well as the LOC being an important antecedent of control perceptions in the work context (Parkes, 1989; Spector, 1982), LOC may exert a moderating effect on the JDC or JDCS model's components. This would be demonstrated in a three-way interaction of job demand x job control x locus of control in a test of the JDC model or a four-way interaction of job demand x job control x support x locus of control in a test of JDCS model. The expectation is that internals and externals would differ in their experience of stress, in that the buffering effects of job control (and/or support) would only occur for those with internal and not external orientation. Such a prediction has been tested empirically, however, the research is limited and findings equivocal.

Locus of Control as a Moderator in the Job Demand-Control- Support Theory: Empirical Evidence

Considering the LOC research presented above, tenets of the differential reactivity of personality theory (Bolger & Zuckerman, 1995) and relevant research, it appears that individuals low in internality (or externals) would be especially vulnerable to the effects of job stressors while those with high internality (internals) would be protected against strain by more efficient use of control in the work environment. To some degree, such predictions are also supported by the transactional stress framework (Lazarus & Folkman, 1984) in which the influence of inner person factors such as beliefs and dispositions on the appraisal and adaptability (i.e., coping) is acknowledged. Thus, not surprisingly, the potential moderating or buffering effect of LOC has been examined in

the JDC/JDCS theory both cross-sectionally and longitudinally and with various occupations and outcomes.

As mentioned earlier, this research is scant and not consistent, with some studies showing expected interactions (Daniels & Guppy, 1994; Meier et al., 2008; Rodriguez et al., 2001; Siu & Cooper, 1998), while other reports demonstrating interactions opposite to main predictions (Parkes, 1991; Siu, Spector, Cooper, Lu, & Yu, 2002) or no evidence for any interactions (Saade & Marchand, 2013). For example, Meier et al. (2008) using a sample of $N = 96$ workers from a Swiss logistic corporation tested the moderating influence of LOC in the JDC model with musculoskeletal pain and affective stress as the outcome variables. The results showed that as expected, the interaction posited by the JDC model held only for individuals with internal LOC. In contrast to workers with external orientation, internals benefited more from job control which protected them against the effects of strain. A prospective report by Daniels and Guppy (1994) documented similar findings, but with the JDCS model and a sample of $N = 244$ accountants. The moderating effects of both control and support, as predicted by the model, synergistically moderated the influence of stressors on psychological well-being for individuals with internal and not external control beliefs.

Research by Parkes (1991) who tested the moderating effect of LOC in the JDC model on two samples comprised of civil servants ($N = 590$) and student teachers ($N = 147$) revealed findings contrary to the predictions. The data showed the expected buffering effect of control against psychological strain for externals, while only additive effects were found for internals. Further, a multi-national, longitudinal study with $N =$

543 computer data processors by Rodriguez et al. (2001) also produced results opposite to the JDCS model's predictions. More specifically, the researchers found greater decrements in job satisfaction for internals with high job control, especially in the presence of high social support. Reports of null findings by Saade and Marchand (2013) add to these inconsistent results by demonstrating that individuals' control beliefs fail to buffer against the impact of work stressors on psychotropic drug use.

Al in all, the mixed results for LOC as the moderator of the JDC model's dimensions do not detract from the important role this disposition plays in the stress process and strain outcomes, as originally hypothesized by Rotter as well as supported by research examining the transactional stress theory and demonstrating person factors (i.e., individual's perception and appraisal of stressors) influencing adjustment. As an antecedent to perceived control, LOC makes an ideal personal attribute to be examined for its potential moderating role in the JDC model. This notion is also clearly supported by the differential reactivity of personality theory (Bolger & Zuckerman, 1995) and relevant research presented earlier. The inconsistencies in findings, therefore, must be evaluated in light of a broader empirical evidence. Additionally, research on LOC in the context of JDC theory is not only limited, but also dated with no studies testing its moderating properties on job demands being conceptualized as hindrances. Considering the crucial role of LOC in stress adaptation alongside the many research shortcomings, it seems incumbent to reexamine its modulatory effect on the JDC model's components. Such an inquiry may help address the discrepant findings and offer new insights into the stressor-strain relationship.

Dispositional Mindfulness as a Potential Moderator in the Job Demand-Control Model

Just like the LOC construct, mindfulness is also an important individual variable in the stress process and adaptation. It is frequently described as a state-like attitude characterized by enhanced awareness and purposeful, nonjudgmental attention to each successive moment of perception as it unfolds in the here and now (Kabat-Zinn, 2003). Such a present-centered focus and openness to every experience is theorized to create a “psychological space” needed for self-reflection and greater insight (Garland, Farb, Goldin, & Fredrickson, 2015, p. 298). From the Langerian mindfulness perspective (Langer, 2014), mindfulness represents a distinct cognitive mode that facilitates restructuring of rigid mindsets, leading to more flexible and adaptive responses to environmental conditions (i.e., stressors; Crum & Lyddy, 2014). Mindfulness, therefore, appears to aid in the development of new perspectives, broadening the horizons of possibilities, and thus engendering a sense of agency over actions (Fatemi & Langer, 2017).

Being regarded as “the heart” of Buddhist meditative traditions (Kabat-Zinn, 2013, p. 283), mindfulness in the Western world is often actively cultivated through various forms of mindfulness meditation practices. However, it is also recognized as a distinct state of consciousness, with the qualities of awareness and attention being experienced by most people. Thus, mindfulness is not only a state type of mental mode, but also an attribute that varies across individuals (Brown & Ryan, 2003) and could be a valuable resource for a worker dealing with job stressors (i.e., demands). Indeed, a great

volume of literature documents both state/trained and dispositional mindfulness (DM) being associated with a myriad of health benefits such as reduced stress levels (Mahon, Mee, Brett, & Dowling, 2017; Shapiro, Brown, Thoresen, & Plamte, 2011; Wang et al., 2017) and enhanced psychological well-being (Branstrom, Duncan, & Moskowitz, 2010; Hanley, Mehling, & Garland, 2017; Harrington, Loffredo, & Perz, 2014; Richards, Campenni, & Muse-Burke, 2010; de Vibe et al., 2018), including reduced risk for depression (Dixon & Overall, 2016; Moskowitz et al., 2015), anxiety (Diaz, 2018; Rasmussen & Pidgeon, 2011; Singh, Suhas, Visweswaraiah, Hongasandra, & Negendra, 2014), and burnout (Kinnunen, Puolakanaho, Tolvanen, Makikangas, & Lappalainen, 2018; Voci, Veneziani, & Metta, 2016). In addition, research findings have shown that mindfulness has a positive impact on physical health (Loucks, Britton, Howe, Eaton, & Buka, 2015; Murphy, Mermelstein, Edwards, & Gidycz, 2012) in both clinical and non-clinical samples. These findings suggest that mindfulness is a factor in health outcomes, and thus may account for how workers experience and respond to work stressors (i.e., demands). To date, however, no research has explored trait or state mindfulness as an adjunctive moderator in the seminal JDC model and mindfulness research in the work context is surprisingly scarce.

Dispositional Mindfulness in the Work Context

The majority of mindfulness research in the work domain is represented by mindfulness intervention studies with occupational samples characterized by high stress vulnerability (i.e., human services, financial or high technology sectors) (e.g., Bostock, Crosswell, Prather, & Steptoe, 2018; Kinnunen et al., 2018; Shapiro et al., 2011). The

body of such research provides substantial supporting evidence for mindfulness or meditative practices as effective strategies against work related strains (i.e., burnout). Much less mindfulness research and especially that focusing on its trait quality has been conducted with specific work -related factors. However, there is research suggesting a link between DM and adaptive adjustment to work stressors (Atanes et al., 2015; Fisher, Kerr, & Cunningham, 2017; Mesmer-Magnus, Manapragada, Viswesvaran, & Allen, 2017; Westphal et al., 2015).

For instance, results from recent meta-analysis by Mesmer-Magnus et al. (2017) revealed that DM was positively correlated with occupational factors such as performance, interpersonal relations, and job satisfaction and negatively with work withdrawal and burnout. Moreover, DM explained variance in job performance and burnout beyond that predicted by other commonly examined factors (e.g., work effort and job stressors). In another study, Fisher et al. (2017) found DM to be an important resource for police officers ($N = 239$) against various work stressors (i.e., workload, experienced incivility) and related strains (i.e., job dissatisfaction and mental/physical health problems). The data showed that DM exerted a moderating effect on the relationship between workload and mental/physical strain. Participants high in DM seemed to adapt better to workload and were less vulnerable to its negative health effects. Similar findings have been reported by Westphal et al. (2015) who examined the role of DM in work stressors and mental health employing a sample of emergency room nurses ($N = 50$). The researchers found that DM was related to reduced levels of depression, anxiety, and burnout. It protected workers against the damaging effects of work stressors.

Taken together, these findings demonstrate that DM represents an important resource for employees, helping them to effectively cope and adjust to work stressors.

Mechanisms of Mindfulness: Decentering and Positive Reappraisal

The mindfulness to health link has been well established, as illustrated by the above research, but the effects of mindfulness are best understood by considering its key cognitive mechanisms, namely, decentering and positive reappraisal (Garland, Gaylord, & Park, 2009; Garland et al., 2010; Shapiro, Carlson, Astin, & Freedman, 2006). As theorized by Garland and colleagues, whether in a state or trait form, mindfulness, through enhanced present-centered awareness and attention capacity, facilitates cognitive distancing from the stressor also known as decentering. Decentering allows an individual to attend to and examine the internal experience more objectively and calmly, reducing chances of automatic reactivity while adapting a broader and more accurate perspective of what is being experienced. This shift in mental focus is thought to foster positive reappraisal, a form of meaning-based coping which allows for an adaptive response to stressors, explaining the many benefits of mindfulness often reported in the literature.

Positive reappraisal, or the process of appraising in general, is also central in the transactional stress framework (Lazarus and Folkman, 1984). During a stressful episode, an individual appraises the situation as either irrelevant, benign-positive, or stressful which influences the coping response. Being mindful, however, through decentering or disidentification from the fixed mental contents, including negative thoughts, emotions, and sensations, allows for cognitive space and flexibility needed to change the meaning of the original appraisal to one that is more congruent with one's values and positive. A

previously made threatening appraisal may be reinterpreted as being benign or positive. Also, positive reappraisal promotes mental contact with the stressor rather than avoidance, which is an adaptive form of coping/responding (Garland et al., 2009).

Empirical Support for the Mechanisms of Mindfulness

A growing body of neuroscientific research provides substantial evidence for the key cognitive processes involved in mindfulness, elucidating their link with salutary outcomes discussed earlier. Such investigations identify similar neural correlates for both decentering and positive reappraisal which help explain their influence on emotion regulatory processes important in coping with stressors. For instance, Lebois et al. (2015) conducted a neuroimaging study in which the researchers examined the neural activity of decentering (disengaging from stressful thoughts) and immersion (engaging in stressful thoughts). The results showed that during the instructed practice of decentering or mindful attention, participants showed greater activity in brain regions associated with perspective shifting, attention control, and inhibitory control. For those engaging in immersion, there was greater activity in brain structures involved in affective, automatic, and visceral states. Mindful attention downregulated, while immersion upregulated the processing of stressful content. Similar results were obtained by Koenigsberg et al. (2010) who found cognitive distancing from aversive stimuli, a concept identical to decentering, to increase neural activity in brain networks involved in attention allocation, perspective-taking, and social cue processing and simultaneously decreased activity in networks associated with negative emotional responding (e.g., amygdala). These findings provide neural support for decentering as an adaptive, emotion regulating strategy.

Neuroimaging studies focusing specifically on positive reappraisal as a mechanism in DM show similar findings. More specifically, such research implicates the brain structure of prefrontal cortex (PFC), which is involved in various cognitive control processes (i.e., identifying and labeling subjective experiences) exerting a modulatory, top-down influence on the amygdala, a center of emotion processing/responding, as the neural marker of cognitive reappraisal processes (Brown, Goodman, & Inzlicht, 2013; Creswell, Way, Eisenberger, & Lieberman, 2007; Frewen et al., 2010; Modinos, Ormel, & Aleman, 2010). For instance, Creswell et al. (2007) using functional neuroimaging and an affect labeling procedure found that during reappraisal of negative stimuli, individuals high in DM had more activity in the prefrontal cortex (PFC) coupled with less activity in the amygdala regions of the brain. Thus, relative to a control group, subjects high in DM exhibited greater down-regulation of the amygdala region of the brain. Similarly, Modinos et al. (2010) neuroimaging report documented PFC regions (i.e., dorsomedial PFC [dmPFC]) activation coupled with reduced amygdala activity during reappraisal of negative images by subjects with higher DM. In another neuroimaging study which relied on a scalp-recorded event related potentials (ERPs) and the Late Positive Potential (LPP) (a measure of early phase of emotion regulation) in particular, Brown et al. (2013) found that higher DM exerted a top-down regulation of brain areas which are active during early stages of processing of emotional content. After controlling for attentional control, subjects with higher DM exposed to arousal inducing unpleasant images had lower LPP, indicating an enhanced early affective processing most likely attributed to less threatening appraisal of the emotional content. Taken together, these findings provide

neural evidence for the notion that mindfulness, through the process of decentering and positive reappraisal leads to greater control of emotions and thus more adaptive response to stressors.

Further evidence for the mechanisms of mindfulness and the role of positive reappraisal in coping with stressors in particular, derives from emerging research demonstrating mindfulness being associated with sustained exposure to aversive experiences (Arch & Craske, 2010; Hill & Updegraff, 2012; Niemiec et al., 2010). For example, in a laboratory study, Arch and Craske (2010) found that participants with higher DM exhibited increased capacity to persist in a voluntary hyperventilation task while also showing lower negative reactivity. In another study, Niemiec et al. (2010) analyzed participants' reactions to existential threat (i.e., contemplation of own death). The findings showed that individuals with higher DM showed less defensiveness, as evidenced by decreased suppression of death thoughts and longer engagement in thoughts of own death. Finally, Hill and Updegraff (2012) monitored participants' daily emotional experiences and found that those with higher DM showed sustained reduced emotional reactivity and dysregulation. They also demonstrated greater capacity to differentiate between emotions, which assisted in responding with more clarity and flexibility to arising emotional experiences.

As the findings demonstrate, the mechanisms involved in DM (decentering and positive reappraisal) seem crucial for more flexible and adaptive response to stressors, suggesting the modulatory role of DM in the stressor-strain relationship. The evidence is also in line with both the transactional stress framework (Lazarus & Folkman, 1984), that

emphasizes the important role of appraisal in the stress process, including coping, and the differential reactivity of personality theory (Bolger and Zuckerman, 1995) that points to dispositions exerting modulatory influence on the stressor- strain linkage. DM may, therefore, be an important individual difference variable to consider in tests of the JDC model's buffer hypothesis. The cognitive control of affect inherent in DM may increase perceived control needed to buffer against strain effects such as burnout. Expanding the JDC model by including this unique person attribute as a secondary moderating variable may help explain the job stress management process and health. This would be a first such investigation, making a valuable contribution to the limited mindfulness research in the occupational domain.

Summary

Contemporary workplaces are demanding and stressful, negatively impacting the health of individual employees and organizations. The pervasive burnout phenomenon affecting workers across diverse occupational sectors represents one important health cost of chronic work stress exposure, necessitating knowledge about protective factors. In this literature review, using the JDC model (Karasek, 1979) and its buffer hypothesis in particular, I attempted to demonstrate how work strain in the form of burnout could be alleviated or prevented. As the presented research testing the validity of the buffer hypothesis showed, a limited set of variables— job demands and job control, and/or social support included in the expanded version of the JDC model, the JDCS (Johnson & Hall, 1988) — do not always synergistically combine to explain health outcomes. The body of such research has produced largely inconsistent findings suggesting the

possibility that other, unaccounted for factors may exert influence on the demand-control interaction.

To increase the predictive power of the buffer hypothesis, I evaluated the JDC model's main constraints and used supportive theories and research to suggest crucial theoretical refinements. In accordance with the challenge-hindrance model (Cavanaugh et al., 2000) and its recent application in the JDC/JDCS theory, I proposed that testing of the buffer hypothesis in this inquiry should focus on hindrance type of demands. Further, being guided by the transactional stress framework (Lazarus and Folkman, 1984), which served as an overarching theoretical perspective, and the differential reactivity of personality theory (Bolger & Zuckerman, 1995), I presented dispositional variables of LOC and mindfulness as potential moderators of the JDC model's components. As the relevant research indicated, both LOC and mindfulness may be important internal resources for employees dealing with stressful work demands, and thus could moderate the JDC model's components in prediction of burnout. While there is no research testing the buffering effect of mindfulness in the JDC theory, LOC has been examined, however, the research is inconsistent and outdated calling for a new inquiry. Thus, the aim of this study was to address the discrepancies and fill the lacuna, respectively, by testing LOC and mindfulness as secondary moderators of the hindrance demand-control-burnout association. The results may generate new insights into the complex stressor-burnout relationship, making an important contribution to the occupational stress literature and to organizational stress management in particular.

The literature review included a thorough examination of the empirical data to support the need for the present investigation. In Chapter 3, I present a description of research methods, the research design, sampling design and procedures, including measures selected to assess the key variables in this study.

Chapter 3: Research Method

Introduction

This chapter focuses on research methods used to test the hypothesized moderation effects of LOC and mindfulness. A detailed description of the research design, sampling design, and procedures is presented, followed by a description of the instruments selected to assess the key variables of the study. Main threats to validity of the study are also carefully delineated. The chapter concludes with a discussion on anticipated ethical issues of this investigation.

Research Design

A cross-sectional, quantitative research design was used to examine individual variables of LOC and dispositional mindfulness as potential moderators of the hindrance demand-job control interaction effects in relation to burnout as the outcome variable. The data for independent and dependent variables were derived from self-report surveys, a methodology which allows for investigating the proposed interaction effects. The cross-sectional design precludes from drawing causal inferences, limiting the internal validity of the study (Frankfort-Nachmias & Nachmias, 2008). This non-experimental design was selected in place of a true experiment due to the need to examine people's experiences in real life rather than in a highly controlled setting.

Methodology

Sampling Strategy

An online panel supplied by Dynata was the sample source for this cross-sectional survey study. An online panel, also known as an *access panel*, is a sampling frame

consisting of potential survey respondents who have agreed to complete online questionnaires for various studies on regular bases. Such an online panel is nonprobability-based in that any individual with an Internet access and who has received an open invitation to join (e.g., via banners and various forms of messaging) can decide to become a panel member. In other words, the voluntary nature of participation precludes the panel recruiter from estimating the probability of selection of each individual in the panel, which affects the representativeness of the sampling frame (Callegaro et al., 2014). Due to the nature of the online panel, the sampling strategy was not based on probability principles.

The reason for using a nonprobability-based panel is that a complete Internet based, including non-Internet based sampling frame of the population of interest for this study (i.e., U.S. workers, age 18–65) from which a representative sample could be drawn does not exist. Despite this drawback, representativeness of samples obtained from nonprobability-based online panels can be improved through various sampling methodologies (e.g., quota sampling, analytic weighting). Also, compared to offline sampling methods (e.g., mail, face-to-face, telephone), online panels are more attractive in terms of offering efficient and inexpensive data collection and greater accessibility to hard-to-reach populations (Baker et al., 2010; Callegaro & Krosnick, 2014; Craig et al., 2013). Furthermore, Dynata is a sampling vendor that invests resources into developing and maintaining online panels. The company has been in a long-term relationship with online trackers, blogs, diaries, and online bulletin boards, including third-party sample providers, which guarantees diverse online sample sources. Their online panel blend is

monitored and evaluated for quality by a team of analysts and methodologists prior to being included in any sample. And the matching of respondents to most appropriate surveys involves applying principles of sampling science, namely, randomization (ESOMAR, 2018). In sum, the many advantages of online panels in general and the quality and diversity of those provided by Dynata in particular, supported their use for this investigation.

Sampling Design

The respondents for this study were recruited using a quota sampling design. Quota sampling aids in selection of a sample that most closely resembles the sampling or the target population (Frankfort-Nachmias & Nachmias, 2008). Quota sampling methods are frequently used in nonprobability-based online panels to maximize sample representativeness. This process takes place at the questionnaire completion stage and involves setting up a quota or the highest number of participants needed for a particular subgroup within the target population, often based on demographic or other characteristics (Callegaro, Lozar Manfreda, & Vehovar, 2015). For this study, the quota was defined using the following attributes of the target population: U.S. employed adults (ages 18–65) from diverse industries (e.g., manufacturing, retail, and professional) and occupations (e.g., manager, teacher, engineer), working a minimum of 30 hours per week, 50% female and 50% male, and culturally diverse to reflect the current census, which is 76.6% White or Caucasian, 13.2% Black or African-American, and remaining mix of other races (United States Census Bureau, 2018). The sample was balanced on gender, age, and race to reflect the census data.

The survey respondents for this study's sample were randomly selected from Dynata's online sample stream. The company uses a three-stage randomization process when matching potential participants with the surveys they are likely to complete, including the survey for this study. This approach is implemented to minimize the self-selection bias present in all nonprobability-based online panels (Callegaro et al., 2014), as well as to reduce the qualification time and improve respondent experience (ESOMAR, 2018).

In the first stage, respondents from Dynata's online panels entering the sampling platform (also referred to as Dynata Dynamix) are randomly selected and invited through online messaging to complete a survey. In the second stage, the respondents are given a set of randomly chosen and methodologically sound profiling questions to answer to better understand them and their interests. After answering and during the third stage of the process, further randomization is employed to match participants with a survey they are likely to complete. Moreover, a survey router, which is a software system that helps allocate interested respondents to surveys, may also be used to enhance the survey qualifying process. The survey router is managed so that it includes a significant number of diverse projects (i.e., surveys), which further addresses the issue of self-selection bias (ESOMAR, 2018).

Procedures and Data Collection

The survey data were collected by Dynata, an online panel provider after approval from Walden University's Institutional Review Board (IRB; approval # 09-06-19-0251067). I provided Dynata with a survey questionnaire for use with the selected,

qualified respondents. The survey document included items deriving from several measures assessing this study's main variables. In addition to specific items and instructions for completing them, respondents were asked to provide basic demographic and employment information and, most importantly, the informed consent. The informed consent was inserted before all other information on the survey to ensure transparency as to the voluntary participation and also covered areas such as the study purpose, confidentiality, and limitations, as well as benefits (e.g., helping increase knowledge on occupational stress/coping) and potential risks (e.g., emotional upset) of participation.

Respondents for this survey were selected from the general population panel. Such panels are large in terms of the number of panelists and diverse so that all types of respondents, including those from hard-to-reach subpopulations are incorporated (Callegaro et al., 2014). Dynata's general population panel is comprised of individuals from various online environments, which include social networks (e.g., Facebook, Twitter, etc.) and all sorts of websites, panels, and online communities. The panel is developed and maintained to resemble the diversity of the general population, including rare groups of individuals. Furthermore, the prospective general population panel members are invited through various methodologies, including telephone alerts, short message service/text messaging, e-mail, banner ads, and messaging on websites and communities. The content of such messaging varies and is created to appeal to people's intrinsic (e.g., making a difference and helping others) and extrinsic (e.g., nonmonetary and monetary rewards) motives (ESOMAR, 2018).

The allocation of respondents to this survey was aided by the profiling process and to some degree influenced by the incentives offered. Profiling of panel members involves answering various questions covering different topics. This information is used for the purpose of developing a diverse online panel and for selecting individuals for specific research studies (Callegaro et al., 2014). Dynata's profiling involves gathering various data on their panelists such as demographic, psychographic (e.g., values, interests, and personality traits), attitudinal, behavioral, and experiential. This information assists in getting access to respondents for this study, based on specified target population characteristics.

Another important factor influencing availability of respondents for this study was the reward offered by the panel company. Incentives vary in type (e.g., cash, gift cards) and are contingent on the completion of the survey. They are not only important for participation, but also for the quality of the data (Callegaro et al., 2014). Dynata uses all sorts of incentives with survey respondents. These include money, points, or an ability to donate to charity. In addition, the reward offered is always appropriate for the complexity of the survey, specific population, and regional customs and its value remains the same for each study participant (ESOMAR, 2018).

The data quality was monitored by Dynata's team of specialists, capable of identifying any "problem" participant (e.g., extremely fast survey completion time). Some participants may have been excluded from this study due to participation in another project or upon request. The company ensures, however, that participation is never restricted on previous participation alone to reduce the risk of bias (ESOMAR, 2018).

Sample Size

Considering that a multiple regression analysis is the most appropriate statistical test for conducting the moderation analysis in this study, I determined the sample size using the power analytic framework, as recommended by Green (1991). Power analysis, when performed at the planning stage of research, assists in estimating the minimum sample size needed to quantify a probability of finding a statistically significant effect in the study, if it actually exists. In other words, it is a probability of refuting the null hypothesis when it is indeed false (Green, 1991).

According to Cohen (1992), determining a sample size using power analysis requires the following parameters: the effect size (ES), the alpha level (α), and the power level ($1-\beta$ error probability). For the ES, which is the degree to which the null hypothesis is false, research with similar to this study's variables was reviewed for the reported R^2 values (e.g., Dawson et al., 2016; de Rijk, Le Blanc, Schaufeli, & de Jonge, 1998; Parkes, 1991), which ranged from .24 to .75. Considering that a larger ES may inflate the significance of the relationship between variables (Cohen, 1992), a value of .10 was selected, a medium effect size, as per Cohen's d effect size estimates, which are .02, .13, and .26, representing small, medium, and large effect, respectively. The alpha level (α), which is the likelihood of wrongly rejecting the null hypothesis was set at .05. This value is appropriate as any higher value would increase the risk of false rejection (Chuan, 2006). Finally, the power level ($1-\beta$ error probability) where β is the likelihood of refuting the null hypothesis when it is false or accepting it when it is false (also known as Type II error) was set at .80, a benchmark recommended by Cohen (1992). These values

along with six predictors were entered into the G*Power calculator for linear multiple regression which recommended a minimum of 145 participants for this study.

Instrumentation

In this section, I present the psychometric data from extant validation research for the instruments selected to measure the key constructs in this study. The constructs include the following hindrance type of demands: interpersonal conflict, which was measured with the Interpersonal Conflict at Work Scale (ICAWS, Spector and Jex, 1998), role conflict, which was assessed with the Role Conflict Scale (RCS; Bowling et al., 2017), and organizational politics, which was evaluated using the Perception of Organizational Politics Scale (POPS; Kacmar & Carlson, 1997). The remaining three constructs are moderators and include: job control, which was measured using the Factual Autonomy Scale (FAS; Spector & Fox, 2003), locus of control, which was assessed using the Internal-External Control Scale (I-E; Rotter, 1966), and dispositional mindfulness, which was evaluated using the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). The discussion highlights both strengths and any limitations of the instruments and a rationale is provided as for their selection for this study.

Hindrance Job Demands

Interpersonal conflict. The interpersonal conflict demand was measured with the Interpersonal Conflict at Work Scale (ICAWS, Spector and Jex, 1998), which as its name suggests, assesses for the level of conflict with others at a work setting. More specifically, the scale measures workers' perceived frequency of interpersonal conflicts (i.e., disagreements) or being treated poorly at work. The scale consists of a total of four

items, all of which ask to indicate the frequency of conflict with others. An example of item is “How often do you get into arguments with others at work?” (Spector & Jex, 1997, p. 1). The items are rated on a five-point scale from 1 (never) to 5 (very often). High scores indicate high interpersonal conflict and can range from 4 to 20.

Reliability and validity. The ICAWS was developed by Spector and Jex (1998) who evaluated this instrument’s psychometric properties using a meta-analysis rather than performing a single validation study. Such a method, the researchers argued, can generate data reflecting more accurate correlations between ICAWS and variables frequently examined in the working population (e.g., other work stressors and strains). In addition, it can help minimize the risk of Type I error (or false rejection of null hypothesis) and demonstrate the generalizability of results across diverse working groups.

The meta-analysis, therefore, served as a method for establishing the construct validity of the ICAWS. More specifically, Spector and Jex (1998) examined the evidence for nomological validity of the ICAWS, a form of construct validity (Cronbach & Meehl, 1955) which is determined by observing how the measure performs within a network of other, similar constructs. In other words, the authors focused on the extent to which the ICAWS demonstrates expected pattern of associations with other variables. Informed by past research, the authors hypothesized that the ICAWS will be associated with both psychological and physical strains. For instance, interpersonal conflict may initially elicit minor frustrations, but over time, lead to feelings of depression, negatively affecting work engagement/attendance. Also, due to research showing a link between emotional

experiences and physical symptoms, interpersonal conflict may also be related to physical symptoms (Spector & Jex, 1998).

In the meta-analysis, Spector and Jex (1998) focused on the ICAWS's relationship with three other scales measuring different stressors and strains such as the Organizational Constraints Scale (OCS), Quantitative Workload Inventory (QWI), and Physical Symptoms Inventory (PSI), also developed by the authors and psychometrically evaluated in the same study. Other variables used in the correlation analysis included select demographic variables and different job stressors (e.g., job autonomy, role conflict, and role ambiguity) and strains (anxiety, depression, frustration, and job satisfaction), including personality (e.g., self-esteem, trait anxiety) and job performance. In addition, convergent validity, which is observed when an instrument correlates significantly with other instruments assessing the same construct (Zechmeister et al., 2001) was evaluated by comparing the ratings on the ICAWS with those obtained using non-incumbent measures (e.g., supervisors, peers, subordinates) (Spector & Jex, 1998).

The data derived from 18 studies (19 samples) ($N = 3,868$) which were diverse in terms of jobs and types of organizations, with populations mostly from North America region (Spector & Jex, 1998). Spector and Jex (1998) reported the internal consistency reliability (Coefficient alpha) for the ICAWS to be .74 across 13 studies ($n = 3,363$). The results from the meta-analysis revealed the expected pattern of relations between ICAWS and various other variables. For instance, the correlations of ICAWS with the QWI and the OCS were .20 and .44, respectively. The modest association between the ICAWS and the measure of workload (QWI), the authors deduced, likely reflects their

differences in the nature of conflict they assess. The ICAWS focuses on interpersonal, while the QWI on work task related conflict. Also, the higher correlation between the ICAWS and the OCS reflects the fact the OCS assesses for constraints which are both interpersonal and work task oriented. In addition, the ICAWS, like the other two stressor scales demonstrated modest correlations with the symptom scales of the PSI measure (.25 for have symptoms and .12 for doctor symptoms).

When evaluating the ICAWS relationship with other variables, the results indicated that just like the other two stressor scales, it correlated most strongly with role conflict (.40) and to a lesser extent with role ambiguity (.29) and negative affectivity (.33). Also, similarly to the other scales, the ICAWS had the strongest and highest in magnitude correlations with psychological strains such as frustration (.32), anxiety (.36), depression (.38), job satisfaction (−.32) and intent to quit (.41). Finally, the ICAWS showed little relation with gender (.15), age (−.06), and self-esteem (−.04) (Spector & Jex, 1998).

Spector and Jex (1998) also provided evidence for convergent validity of the ICAWS. The results showed that the correlation (weighted by sample size) between ICAWS and a parallel measure of interpersonal conflict completed by non-incumbents was .30 for one sample. The authors suggested that due to limited accuracy of non-incumbent responses (Frese & Zapf, 1988), the modest correlation is likely an underestimate of convergence. Additional evidence for convergence comes from other research examining correlations between different data sources (subordinates and supervisors or coworkers) with estimates ranging from .30 (Spector, Dwyer, & Jex, 1988)

to .49 (Fox, Spector, Goh, & Bruursema, 2007). The data indicating discriminant validity of the ICAWS is scarce, however, it can be seen in very low correlations with self-esteem ($-.04$) as reported by Spector and Jex (1998) and unhealthy sugar diet (.07), as recently found by Wright et al. (2017).

In aggregate, the above results provide evidence for the construct validity of the ICAWS measure, as illustrated by its performance within a network of other constructs. As previously noted, such an evaluation of measure's construct validity has an advantage over a single validation study in that it provides more accurate estimates of correlations (Spector & Jex, 1998). Additional evidence for the ICAWS' validity would be very helpful, however, since its introduction to the field and the meta-analysis performed by its developers, very little research has been conducted examining its psychometric properties. This is surprising considering that the ICAWS has been widely used in the literature (Wright et al., 2017). To date, the ICAWS was psychometrically evaluated on workers in Spain (Benitez, Leon-Perez, Ramirez-Marin, Medina, & Munduate, 2012) and Poland (Baka & Bazinska, 2016). The Polish study, which reported findings in English provided satisfactory evidence for the scale's construct validity. Using two, occupationally diverse samples ($N = 382$ and $N = 3,368$), the authors found that the internal consistency of the ICAWS was .80. Furthermore, the test-retest correlation over three months was .86 ($n = 54$). The exploratory and confirmatory factor analysis revealed the ICAWS to have a one-dimensional structure. Finally, the ICAWS showed similar relations with other stressors included in the Spector and Jex (1998) meta-analysis. For example, ICAWS correlated with quantitative workload, as measured by the

QWI (.29) and organizational constraints as measured by the OCS (.55). Also, the scale correlated with constructs of job strain not evaluated in the Spector and Jex (1988) study such as perceived stress (.35), job burnout (.32), work- family conflict (.21) and family-work conflict (.19). These findings demonstrate that the relations of ICAWS with various work constructs generalize across different working populations, which strengthens the construct validity of the instrument.

Role conflict. The role conflict demand was assessed with the Role Conflict Scale (RCS), which was recently developed by Bowling et al. (2017) with an intention to provide researchers with a psychometrically superior measure of work role stress. For decades, the Rizzo, House, and Lirtzman (1970) Role Conflict (RC) measure has dominated the literature, but with questionable validity (e.g., Gilboa, Shirom, Fried, & Cooper, 2008; Harris, 1991; King & King, 1990; McGee, Ferguson, Jr., & Seers, 1989; Tracy & Johnson, 1981, 1983), new and improved measures were needed. The developers of the RCS have accounted for the major limitations of the Rizzo et al. (1970) RC questionnaire in areas of construct and content validity. The RCS has demonstrated desired psychometric properties, making it a much better option for assessing work role stress (Bowling et al., 2017).

Bowling et al. (2017) defined role conflict as incompatible work demands or expectations. The RCS consists of six items, each measuring the extent of incompatible work demands on a seven-point rating scale from 1 (strongly disagree) to 7 (strongly agree). The first three items are positively scored and the remaining three are reverse-scored. The scores range from 6 to 42, with higher scores reflecting higher role conflict.

An example of a role conflict item is “My superiors often tell me to do two different things that can’t both be done” (Bowling et al., 2017, p. 4).

Reliability and validity. The RCS was validated by Bowling et al. (2017) using five different studies, with each addressing a different aspect of the scale’s validity (i.e., item analysis, substantive validity, construct validity, test-retest reliability, and factor structure). The total number of participants from diverse occupational sectors (e.g., nursing, accounting, social work) primarily within the United States was $N = 1,869$. The authors found that the RCS demonstrated high internal-consistency reliability, ranging from .77 (Study 4) to .89 (Study 1). Moreover, the RCS had better substantive validity compared to the Rizzo et al. (1970) RC questionnaire. The mean PSA value representing the proportion of substantive agreement (or proportion of judges assigning a particular scale item to its expected construct definition) was .74 for the RCS scale and .52 for the Rizzo et al. (1970) scale. Also, the mean CSV score representing substantive-validity coefficient (or the degree to which judges assigned a particular scale item to its expected construct definition versus the unexpected construct definition) was also higher for the RCS scale (.57) compared to the Rizzo et al. (1970) RC instrument (.21). The test-retest reliability (4-week interval) was .64 ($p < .01$), with little difference between the mean T1 RCS score ($M = 4.30$) and the mean T2 RCS score ($M = 4.16, t = 1.11, n. s.$). The confirmatory factor analysis (CFA) revealed support for a two-factor model, with RCS items loading on a distinct factor from that of the role ambiguity scale. The factor loadings representing items from both scales were all statistically significant

($p < .01$) and were $\geq .54$. In addition, there was a positive correlation ($r = .51$; $p < .01$) between latent role ambiguity and latent role conflict items (Bowling et al., 2017).

The convergent validity was demonstrated by the RCS correlating with the Rizzo et al. (1970) RC scale ($r = .68, p < .01$). Also, the RCS correlated with various external variables in the expected direction such as with physical symptoms (.23), psychological symptoms (.41), global job satisfaction (−.26), perceived organizational support (−.34), satisfaction with supervision (−.34), and withdrawal behavior (.13). For the set of these variables, the mean correlation for the RCS was significantly lower compared to that of the Rizzo et al. (1970) scale (mean $|r| = .28$ and mean $|r| = .45$, respectively). The RCS, similarly to the Rizzo et al. (1970) RC measure was positively associated with role overload (.69) and four types of boundary spanning such as that involving supervisors (.49), coworkers (.59), other departments (.61), and organizational outsiders (.42). For this set of variables, the mean correlation for the RCS was $|r| = .54$ and the mean correlation for the Rizzo et al. (1970) RC measure was $|r| = .53$. The evidence for the RCS discriminant validity was seen in absence of a relationship with variables of openness to experience (.00) and self-monitoring (.10). The Rizzo et al. (1970) RC measure, however, significantly correlated with the self-monitoring variable ($r = .24$; $p < .01$). The researchers also found the RCS scale to have greater capacity to differentiate between role conflict and role ambiguity compared to the Rizzo et al. (1970) RC questionnaire (Bowling et al., 2017).

Taken together, the findings indicate that the RCS scale is a psychometrically robust measure with better validity than the Rizzo et al. (1970) RC instrument. Due to its

rather recent introduction, however, the RCS has not been validated in other studies.

Despite the lack of additional validation research, the psychometric evidence presented above is quite strong supporting the use of the RCS in the present study.

Organizational politics. The organizational politics demand was assessed with The Perception of Organizational Politics Scale (POPS; Kacmar & Carlson, 1997). The POPS measures the degree to which people perceive their work contexts as political, and consequently, unfair and unjust. The POPS has three subscales, namely, General Political Behavior assessed with two items (e.g., “People in this organization attempt to build themselves up by tearing others down”), Go Along to Get Ahead assessed with nine items (e.g., “Agreeing with powerful others is the best alternative in this organization”), and Pay and Promotion Policies assessed with six items (e.g., “None of the raises I have received are consistent with the policies on how raises and promotions are determined”) (Kacmar & Carlson, 1997, p. 651). The POPS has 15 items total, which are rated on a seven-point scale from 1 (strongly disagree) to 7 (strongly agree). Higher scores reflect views of greater political atmosphere at a work setting and can range from 15 to 105 (Kacmar & Carlson, 1997).

Reliability and validity. The initial POPS scale was a 12-item measure developed by Kacmar and Ferris (1991), which has been used extensively in the politics research domain (Harris & Kacmar, 2005). To address some of the scale’s psychometric issues, Kacmar and Carlson (1997) performed further validation of the POPS by conducting three studies with a total of $N = 2,758$ respondents (e.g., state agency employees, undergraduate college students, members of human resource management

society). Based on the findings, the POPS scale was revised forming a 15-item measure. The new, 15-item POPS scale was examined for dimensionality using a sample of $N = 600$ participants, with results showing a three-factor model fit. The reported internal reliability estimate was .81.

The convergent and discriminant validity were examined for the reduced, six-item scale (prior to new item addition) with eight additional scales that assessed for theoretically related constructs (e.g., trust, faith in people, altruism, self-activity, cynicism, alienation, alienation via rejection, and social attitude). For this analysis, Kacmar and Carlson (1997) followed the process recommended by Anderson and Gerbing (1988). More specifically, measurement and structural models were built and tested allowing for a confirmatory assessment of both types of validity. The researchers included all of variables of interest in the model. Also, the authors ensured that all of the indicators associated with the variable of interest were unidimensional. To accomplish this task, an exploratory factor analyses were conducted on the additional eight scales so that subscales could be developed when needed.

Per Kacmar and Carlson (1997), the results indicated an acceptable fit for the model tested ($GFI = .88$, $PGFI = .74$, $PNFI = .70$, $CF = .88$) allowing for an evaluation of both convergent and discriminant validity. The authors aimed to demonstrate convergent validity by examining the relations between the POPS scale and theoretically similar constructs, as mentioned earlier. Positive and significant associations with such constructs would indicate convergence. Here, it is important to note that while this approach is quite common in the literature, a better test of convergent validity is to

evaluate how well two measures of the same (not similar or theoretically relevant) construct converge (Zechmeister et al., 2001). In other words, the POPS should be compared to another measure assessing organizational politics or its scores should be correlated with those deriving from other sources (e.g., employees and peers or supervisors). This was not the case in this validation study. Per Kacmar and Carlson (1997), evidence of convergence was evident simply by observing that every correlation coefficient in the measurement model was significant. However, the authors failed to list the correlation estimates generated by the analysis.

In terms of discriminant validity, the authors expected the POPS scale to discriminate itself from conceptually similar measures. In other words, the scale would correlate with the other constructs, but not too highly. As in the case of convergent validity, a better test of discriminant validity would be to examine relations between POPS and measures of different and unrelated constructs (Zechmeister et al., 2001). According to Kacmar and Carlson (1997), the results demonstrated that all correlations ranged from .24 to .59 and because these values significantly differed from 1.0, distinct constructs were measured.

It is difficult to judge the psychometric properties of the new 15-item POPS based on the above results. Due to the fact that the authors evaluated the construct validity of POPS by comparing it to theoretically similar constructs only, higher than expected values for discriminant validity should not be surprising. Unfortunately, the estimates indicating convergence were not reported. In an earlier validation study of the original 12-item POPS scale, Nye and Witt (1993) found a conceptual overlap with the Survey of

Perceived Organizational Support (SPOS; Eisenberger, Huntington, Hutchison, & Sowa, 1986), with reported correlation between POPS and SPOS of $-.85$. A limitation of the most recent validation of POPS (Kacmar & Carlson, 1997) is that the SPOS was not included in evaluations of convergent and discriminant validity. Other researchers, however, have examined the relations between these two constructs (e.g., Andrews & Kacmar, 2001; Cropanzano, Howes, Grandey, & Toth, 1997; Harris, Harris, & Harvey, 2007; Randall, Cropanzano, Bormann, & Birjulin, 1999). Overall, the results suggest strong inverse correlations ranging from $-.60$ (Cropanzano et al., 1997) to $-.77$ (Randall et al., 1999). Recently, however, Lee and Peccei (2011) reported lower in comparison correlations between the POPS (15-item measure) and SPOS, with the values of $-.54$ (Time 1) and $-.56$ (Time 2). In this study, the researchers conducted tests of one and two-factor models for POPS and SPOS at two different times. The one factor model assumed that items from both measures would load on a single latent construct and the two-factor model assumed that items from both measures would load on their distinct latent constructs. At both Time 1 and Time 2, the two-factor model provided better fit, indicating that both POPS and SPOS are separate constructs while being moderately correlated. Similar findings were reported by Harris et al. (2007) who found a correlation of $-.72$ between the two measures. The researchers also found support for the two-factor model pointing to POPS and SPOS representing distinct constructs.

According to Kacmar and Carlson (1997), the overlap between POPS and SPOS does exist, but the scales differ in important aspects. The SPOS assesses how the individual perceives the “organization” is treating him or her while the POPS focuses on

specific group of individuals the worker interacts with (e.g., supervisors, co-workers).

The conceptual overlap is more likely, therefore, when individuals completing both measures are asked to focus on the same group of people within the organization, but not when rating those in top management positions. This contention seems to be supported by the higher correlations between the two measures found in the literature. It is also possible that the lower correlations reported by Lee and Peccei (2011) could be attributed to the new and improved POPS measure.

Since its introduction, the POPS scale has undergone many revisions in an attempt to improve its psychometric properties. For instance, in the first validation study, Kacmar and Ferris (1991) removed several items from POPS which correlated with the Job Descriptive Index (JDI) subscales (i.e., pay, promotions, co-workers, and supervisors) developed by Smith, Kendall, and Hulin (1969) (as cited in Kacmar & Ferris, 1991). The end result was a 12-item POPS with a three-factor structure (i.e., General Political Behavior, Go Along to Get Ahead, and Pay and Promotion). In subsequent validation by Nye and Witt (1993), a one-factor structure was found, therefore, the issue of dimensionality was addressed in later research. Kacmar and Carlson (1997) compared the initially found three-factor model to a one-factor model, with the results showing that although the three-factor model fit the data better, some improvement to the scale items could still be made. Thus, the scale was refined by removing and adding new items. The final 15-item POPS was examined for dimensionality and the data supported a three-factor model.

In sum, the 15-item POPS is a psychometrically improved measure of organizational politics. Despite several revisions, certain limitations exist requiring further validation. Since the last validation study by Kacmar and Carlson (1997), however, no research has undertaken this task. Also, no other measures have been developed assessing politics in the work context. The exception may be Drory's (1993) Political Climate scale, but research has shown that it measures organizational rather than individual differences (Ferris, Adams, Kolodinsky, Hochwarter, & Ammeter, 2002). Considering the impact of politics on the well-being of workers and organizations (Bedi & Schat, 2013), the POPS remains a measure widely used in empirical investigations (e.g., Chang, Rosen, Siemieniec, & Johnson, 2012; Cho & Yang, 2018; Wiltshire, Bourdage, & Lee, 2014).

Moderators

Job control. Job control is frequently defined as the degree to which workers exercise autonomy at their jobs in terms of task completion and engagement in decision making (Kain & Jex, 2010). In the context of JDC model research, job control has been frequently assessed with subscales from either the Job Content Questionnaire (JCQ; Karasek et al., 1998) (e.g., Melamed et al., 2011; Van Doorn, van Ruysseveldt, van Dam, Mistiaen, & Nikolova, 2016) or from another measure such as the Job Diagnostic Survey (JDS; Hackman & Oldham, 1975) (e.g., Beehr et al., 2001; Tucker et al., 2008). Unfortunately, both instruments have limitations which may undermine the validity of the findings.

The JCQ control subscale is a measure of decision latitude which includes not only items assessing job control, but also those that are clearly conceptually different such as skill variety, skill utilization, and general job complexity (Karasek, 1979). Such broad assessment of the control construct, some researchers argue (e.g., Van der Doef & Maes, 1999), may have been a factor in many studies failings to detect the hypothesized control-demand interaction effects. The JDS job control subscale on the other hand, has only three items assessing job autonomy and has been criticized for not being objective enough in its assessment of job characteristics (Taber & Taylor, 1990). While the issue of subjectivity in assessment of job control is not unique to the JDS measure alone, more descriptive and fact-based measure of control would provide a much more accurate assessment of such a construct (Spector, 2000).

In response to the aforementioned concerns, Spector and Fox (2003) developed the Factual Autonomy Scale (FAS). Unlike the autonomy subscale of the JDS, the FAS assesses worker's job autonomy by asking fact-based or more concrete type of questions. The scale has a total of 10 items with the first seven asking whether a worker needs to seek permission to take a break, change work hours, or leave early for the day. For this set of questions, the responses are rated on a five-point scale from 1 (never) to 5 (extremely often or always). The remaining three questions pertain to the frequency of events occurring at the job. An example item is "How often does someone tell you when you are to do your work?" (Spector & Fox, 2003, p. 423). The response format is a five-point scale from 1 (never) to 5 (every day). The scores can range from 10 to 50 and after reversal, high scores represent high and low scores, low level of control.

Reliability and validity. The FAS along with the JDS measure were validated with university and private sector workers of diverse job profiles (e.g., supervisory, non-supervisory, professional and non-professional). The first study included $N = 106$ worker-supervisor pairs and the second study had a total of $N = 343$ worker-coworker pairs. The FAS and the JDS were completed by workers, supervisors, and coworkers. The FAS demonstrated adequate internal consistency reliability estimates which ranged from 0.81 to 0.87. The results also indicated that the FAS performed better in terms of convergent and discriminant validity compared to the JDS autonomy scale (Spector & Fox, 2003).

In the first study, the evidence for FAS demonstrating better convergent validity than the JDS is quite clear. As the results showed, the correlation between worker completed FAS and supervisor completed FAS measures was 0.53, while the correlation between both sources for the JDS was not only lower, but also nonsignificant (0.15). In the second study, corresponding worker and coworker completed measures were correlated for both FAS and the JDS, with FAS again showing higher estimates than the JDS (0.38 and 0.16, respectively). The FAS also demonstrated superior discriminant validity. Across the two studies, the JDS autonomy scale had much higher correlations with various JDS subscales, which for worker completed measures ranged from 0.47 to 0.67 and for other sources (supervisors and coworkers), from 0.51 to 0.69. The FAS, however, showed much lower correlations with the other JDS subscales for all sources, with the exception of the autonomy subscale (Spector & Fox, 2003).

Finally, the FAS and JDS were also evaluated for their associations with job satisfaction and job performance. In Study 1, the FAS showed no correlation with job satisfaction and in Study 2, a small correlation (0.22) was detected. The JDS, however, demonstrated similar correlation of 0.21 with job satisfaction (Study 1), which was much higher (0.45) in Study 2. Relations of the scales with job performance revealed that the FAS correlated significantly more strongly with this construct than the JDS measure (0.22 and 0.04, respectively) (Spector & Fox, 2003).

As the above results demonstrate, the FAS has stronger psychometric qualities than the commonly used JDS autonomy scale. While the FAS cannot be regarded as a fully objective measure, its weaker association with job satisfaction scale indicates that it is much less vulnerable to affective bias (Spector & Fox, 2003). In fact, the link between affect and perceptions of job characteristics has been well established (Spector, 2000) and in many studies, researchers deliberately control for negative affectivity (e.g., neuroticism) to avoid a confounding by this variable (e.g., Armon, Shmuel, & Shirom, 2012; Melamed et al., 2011). Controlling for negative affectivity, as argued by Spector, Zapf, Chen, and Frese (2000), however, is not always the best option due to the risk of partialing out the true variance. There are many other, unknown variables that may explain relationships between variables. Thus, the authors recommend using more objective measures of organizational characteristics which have items that are non-affective and more descriptive. The FAS is an example of such an instrument.

In sum, the FAS instrument represents a substantial improvement in terms of assessing the job control construct more objectively. It is surprising, however, that it has

not been used in research testing the JDC model, especially as the most commonly used measures, the JCQ and JDS, have important limitations. To date, there is a record of only two studies using the FAS (e.g., Jonason, Wee, & Li, 2015; Miksaj-Todorovic & Novak, 2008) in which the reported internal consistency reliabilities were .85 and .88, respectively. Miksaj-Todorovic and Novak (2008) cited another cross-cultural study in which the FAS was used and had an internal consistency of .88 (i.e., Bondy, Mesko, Aytac, Eryilmaz, & Bayram, 2006), but the record of this study could not be located. Overall, it is difficult to judge the validity of the FAS instrument based on only one validation study, however, the positive findings reported by Spector and Fox (2003) in conjunction with the limitations of the other measures were the main factors in selecting the FAS for this study.

Locus of control. Locus of control was measured with the Internal-External Control Scale (I-E; Rotter, 1966). The I-E Control Scale was developed by Rotter to assess the degree of internality and externality. It consists of a total of 29 items, with 6 fillers which are forced-choice, meaning the respondent must select either a choice “a” (indicating internality) or “b” (indicating externality) as the answer. The statement selected must reflect what the individual most strongly believes. For example, question 11 “a” and “b” states: “a. Becoming a success is a matter of hard work, luck has little or nothing to do with it; b. Getting a job depends mainly on being in the right place at the right time” (Rotter, 1966, p. 11). The scoring can range from 0 (internality) to 23 (externality). A total score of 12 or less indicates internal locus of control and a score of 13 or more indicates external locus of control (Rotter, 1966).

Reliability and validity. Rotter (1966) reported results from the initial validation of the I-E scale and from several other studies which used samples of university psychology students, prison inmates, and national stratified samples. The internal consistency estimates were found to be moderately high and stable from various samples and ranged from .65 to .79. Test-retest reliability ranged from .60 to .78 at one month and from .49 to .61 at two months. The lower estimates at two months were explained to be the result of the group versus individual administration.

Tests of discriminant validity of the I-E measure were conducted by examining correlations with measures of social desirability and intelligence. Correlations of I-E with the Marlowe-Crowne Social Desirability Scale resulted in estimates that ranged from $-.07$ to $-.35$ (student samples) and $-.41$ (Ohio federal prisoners' sample). The median for all of the student samples was $-.22$. Correlations of I-E with intellectual measures such as the Ohio State Psychological Exam with the university student sample were $-.09$ (female) and $-.11$ (mixed gender) and with the Revised Beta IQ were .01 (Rotter, 1966). All in all, the results show good discriminant validity. However, exceptionally high correlation of $-.41$ between the I-E scale and the social desirability measure was detected (prison sample), which per Rotter may have been the result of the testing conditions. The prisoners were administered both measures at intake while also undergoing classification testing. While the instructions clearly stated that the results are not going to be recorded and are of purely experimental nature, it is likely that many prisoners still questioned the true intent of the testing. This explanation seems to be supported by reported mean scores, which for the prisoner population were much lower compared to the university

student population (7.72 vs. 9.05). Due to the expectation that prisoners are more external than the student population, the lower mean scores for the prison sample seems to point to the testing environment as possibly influencing the obtained results (Rotter, 1966).

In addition to the above discriminant validity findings, the I-E scale seems to have predictive validity as observed in correlations with anxiety measures such as the Taylor Manifest Anxiety Scale (.40) and Test Anxiety Scale (.22) (Ray & Katahn, 1968). In terms of factorial structure, results from two factor analyses revealed that the I-E scale has one general factor, which explained most of the scale variance. Only a small group of items were associated with other factors, with very small variance for each factor. There was no additional factor that would indicate a separate subscale within the I-E measure. The findings clearly pointed to the I-E scale being a unidimensional measure (Rotter, 1966).

Rotter (1966) also reported on research examining construct validity of the I-E scale through multimethod measurement (e.g., forced choice with Likert-type or non-questionnaire method). The results from early studies showed that the original, longer version of the I-E measure (prior to item revision) with its original forced-choice format correlated with a Likert-type scale examining internal and external attitudes (Phares, 1957), with correlations ranging from .55 to .60. In subsequent research, similar relations have been found such as in the study by Cardy (1962) (as cited in Rotter, 1966) in which the biserial correlation between the I-E (revised version) forced choice format and a semi-structured interview measuring internal and external orientation was .61. Taken

together, the results indicate that the factor of locus of control can be reliably measured using different types of methods.

Since the initial validation report by Rotter (1966), several studies have examined the psychometric properties of the I-E scale. More specifically, attention has centered on three major areas believed to affect the construct validity of this measure: the scale's problem of multidimensionality, high correlations with social desirability, and the forced-choice format. In terms of the scale's factor structure and in contrast to Rotter's findings demonstrating the I-E scale being unidimensional, some researchers found it to have two (e.g., Cherlin & Bourgue, 1978; Joe & Jahn, 1973; Lange & Tiggenmann, 1981; Mirels, 1970; Tobacyk, 1978; Watson, 1981) or even three (Roberts & Reid, 1978) four (Collins, 1974) or a six-factor structure (Marsh & Richards, 1987). For instance, Mirels (1970) using a sample of university students identified two factors: a belief of control over one's destiny and a belief of control over world's politics. Such structure was confirmed by Lange and Tiggenmann (1981) with an Australian sample and Tobacyk (1978) with a Polish university student sample. Watson (1981) examined various structures reported in the literature and confirmed the two main factors, namely, general and political. Other researchers such as Ashkanasy (1985), for instance, found support for the two-factor structure reported by Watson (1981) and the four-factor structure reported by Collins (1974), however, the variance explained by the factors was minimal and some findings suggested the I-E scale may indeed represent a unitary construct, as initially found by Rotter. Overall, these findings may raise some doubt about the I-E scale's unidimensionality, however, as noted by Rotter (1975), the foregoing factor analyses

results do not represent “the true structure of the construct” (p. 63). It can be more accurately stated that the findings reveal some similarities among specific group of respondents for a particular group of items.

In addition to the issue of dimensionality of the I-E measure, researchers have questioned its forced choice-format and the relationship with social desirability. As mentioned previously, Rotter (1966) reported higher correlations with the Marlowe-Crowne Social Desirability scale for the prison male population ($-.41$). Similarly, Cone (1971) using four samples (army mental health outpatients, army prisoners, alcoholic inpatients, and new career participants) reported correlations with the Social Desirability scale (Edwards, Walsh, & Diers, 1963) ranging from $-.7$ to $-.29$. And Sommers-Flanagan and Sommers-Flanagan (1987) using a sample of university psychology students reported correlation of $-.40$ with the same scale. The higher correlations suggested that the internal orientation dimension of the I-E measure is associated (confounded) with social desirability.

Kestenbaum (1976) argued that the forced-choice format increases the risk that a member item may represent a more socially desirable response. Contrary to this view, Rotter (1966; 1975) defended the use of a forced-choice scale as a means to control for social desirability. During the scale construction, Rotter eliminated items correlating highly with social desirability. While higher correlation for the prison sample was found, it was suggested that it was due to specific testing conditions characterized by the prisoners undergoing classification evaluations during the same time period. Furthermore, Rotter contended that a socially desirable response may be given to any

item. For instance, it may be comparatively socially desirable for a college student to select either response to an item asking a. “Success in business is a matter of luck” and b. “Success in business is a matter of hard work and skill” (Rotter, 1975, p. 62). It may not be similarly socially desirable to select either statement, however, when one applies for a job. Thus, the testing condition seems to influence whether or not someone responds in a way that is generally deemed more socially desirable. This explanation is supported by research using the I-E scale in which socially desired responding seemed to be influenced by the testing environment (e.g., Davis, Doherty, & Moser, 2014; McBride, 1982).

As the above research demonstrates, the construct validity of the I-E scale has been extensively investigated, with findings being generally supportive of its psychometric properties. Since its introduction by Rotter, the I-E scale has been widely used in research spanning diverse disciplines and populations (Beretvas, Suizzo, Durham, & Yarnell, 2008). Other versions of the scale focusing on specific behaviors or special groups have also been developed such as the Multi-Dimensional Health Locus of Control Scale (MHLC; Wallston, Wallston, & De Vellis, 1978), the Depression Locus of Control (Whitman, Desmond, & Price, 1987), and the Work Locus of Control Scale (Spector, 1988). In this study, the interest was in the general expectancy beliefs of workers, therefore, the I-E scale in its original format was used.

Dispositional mindfulness. The moderating variable of mindfulness was measured with the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), which assesses the main aspects of dispositional mindfulness, namely, open awareness and attention to the present experience. More specifically, the scale detects changes in

person's mindful states. The MAAS has a total of 15 items which are rated on a 6-point scale from 1 (almost always) to 6 (almost never). Sample items are "I could be experiencing some emotion and not be conscious of it until sometime later" and "I do jobs or tasks automatically, without being aware of what I'm doing" (Brown & Ryan, 2003, p. 826). The scale is scored by computing a mean of 15 items, with higher scores indicating greater dispositional mindfulness. The mean score values can range from 1 to 6 (Brown & Ryan, 2003).

Reliability and validity. The MAAS (Brown & Ryan, 2003) was validated using six samples, with five samples of students and one sample comprising of community participants totaling $N = 1,253$. The scale's single factor structure was confirmed and the reported internal reliability estimates were .82 (one of the student samples) and .87 (community sample). The test-retest reliability was .81, with no significant difference in mean scores as measured over a four-week period.

The MAAS has demonstrated satisfactory convergent and discriminant validity. For instance, the data showed MAAS to positively correlate with emotional intelligence (.46), openness to experience (.18), pleasant affect (.40) and negatively with social anxiety (−.36) and rumination (−.39). In addition, the MAAS showed correlations of .31(sample D) and .33 (Sample E) with the mindfulness-mindlessness scale (Bodner & Langer, 2001), but the strongest observed correlation was with the engagement subscale of this measure (.39). The results also showed nonsignificant correlations between MAAS and self-monitoring (−.03) and private self-consciousness (−.05) (Brown & Ryan, 2003).

The MAAS' incremental validity was also evaluated with popular measures of affect such as the Beck Depression Inventory (BDI), Positive and Negative Affect Schedule (PANAS), and Profile of Mood States (POMS) while controlling for various covariates (e.g., emotional intelligence, private self-consciousness, neuroticism, rumination, social desirability, and extroversion). All reported correlations were significant with most reductions observed when controlling for neuroticism in associations with depression, anxiety, and unpleasant affect ($-.16$, $-.12$, and $-.14$, respectively) (Brown & Ryan, 2003).

While the above results support the psychometric properties of the MAAS, subsequent validation research has generated equivocal results pertaining to the scale's dimensionality as well as performance of some of its items. For instance, researchers Carlson and Brown (2005) found support for the one-factor structure, while MacKillop and Anderson (2007) confirmed the unitary structure in their male, but not female college sample. Furthermore, McCracken and Thompson (2009) reported findings demonstrating a four-factor model (e.g., acting with awareness, social awareness, present focus, and responsiveness). And Ghorbani, Watson, and Weathington (2009) evaluation of MAAS in United States and Iran revealed four factors in the American sample and three factors in the Iranian sample, thus failing to confirm the unidimensionality of the MAAS scale as initially found by Brown and Ryan (2003).

Other research has shown problems with the MAAS items, with some authors recommending a shorter version of the instrument. For example, Cordon and Finney (2008) reported inadequate performance of six items of the MAAS measure (Items 2, 3,

5, 6, 13, and 15) in two samples of university students. In another study, Christopher, Charoensuk, Gilbert, Neary, and Pearce (2009) found differential performance of two MAAS items (Items 6 and 11) using a sample of Thai and American students divided into securely and insecurely attached individuals. Moreover, Van Dam, Earleywine, and Borders (2010) found that only five items of MAAS (Items 7, 8, 9, 10, and 14) performed well and that the reduced scale had a unidimensional structure. Finally, Black, Sussman, Johnson, and Milam (2012) using a sample of Chinese adolescents proposed a new, reduced scale consisting of six items (Items 7, 8, 9, 10, 13, and 14) based on the findings of the confirmatory factor analysis.

As the above equivocal findings demonstrate, further validation of the MAAS scale is necessary. To date, one such investigation has been conducted (Osman, Lamis, Bagge, Freedenthal, & Barnes, 2016). Using a sample of $N = 810$ university students, Osman et al. (2016) performed both exploratory (EFA) and confirmatory (CFA) factor analysis to examine the 15-item MAAS scale's dimensionality. The data from the EFA provided support for a one-factor solution, with results accounting for 41.84% of common variance. These results suggested a unidimensional structure, a finding confirmed with the CFA analysis. All of the 15 MAAS items loaded significantly on a common factor.

Osman et al. (2016) also examined the performance of MAAS items with functioning analysis of the item response theory modelling. The findings revealed that participants in both groups (identified as high and low on nonattachment) provided similar responses to the scale's items. Further results from item analysis led to scale

reduction and a 5-item measure of MAAS was examined for its performance and compared to the original 15-item measure. The findings showed that the group of individuals with high levels of nonattachment had a higher mean MAAS score compared to the group with low nonattachment. The reliability of the 15-item scale was $p = .90$, 95% CI [.89, .92] (high nonattachment group) and $p = .89$, 95% CI [.87, .91] (low nonattachment group). The results for the reduced 5-item MAAS measure were similar in that higher mean score was obtained by the high nonattachment group. The reduced scale's reliabilities were slightly lower with the reported estimates of $p = .88$, 95% CI [.86, .90] (high nonattachment group) and $p = .85$, 95% CI [.82, .87] (low nonattachment group).

The researcher also evaluated the performance of both scales with instruments assessing similar constructs. For example, the 15-item MAAS scale showed significant and positive correlations with measures such as the Self-Monitoring scale (.42), the Positive Focus scale (.19), and the Adaptive Expression scale (.21). Also, negative associations were found between the MAAS and similar constructs examined in the Brown and Ryan (2003) validation study such as the Beck Depression Inventory II (−.46), negative focus regarding the future (−.44), and maladaptive expression of anger (−.34) (Osman et al., 2016)

Similar pattern of relations with the above constructs emerged for the short, 5-item version of the MAAS and the correlations were as follows: The Self-Monitoring scale (.37), the Adaptive Expression scale (.20), the Beck Depression Inventory II (−.41),

negative focus regarding the future ($-.39$), and maladaptive expression of anger ($-.29$) (Osman et al., 2016).

In sum, the above results strengthen the initial findings reported by Brown and Ryan (2003) especially in area of the scale's dimensionality and associations with related constructs. Further such investigations are certainly needed to replicate the results in light of previous research which produced conflicting findings. This is especially true for the shorter version of the MAAS scale. Overall, the data provides support for the psychometric properties of the MAAS instrument.

Outcome Variable

Burnout. The outcome variable of burnout was assessed with the Oldenburg Burnout Inventory (OLBI; Halbesleben & Demerouti, 2005). This OLBI was developed in response to theoretical and psychometric limitations of the Maslach's Burnout Inventory- General Survey (MBI-GS; Maslach, Jackson, & Leiter, 1997), a commonly used measure of burnout in the general working population. According to Halbesleben and Demerouti (2005), unlike the MBI-GS, which has a three-factor structure (emotional exhaustion, depersonalization, and personal accomplishment), the OLBI has a two-factor structure (exhaustion and disengagement). The omission of personal accomplishment dimension was based on past research which has shown this variable being differentially associated with job related outcomes (e.g., job satisfaction, organizational commitment; Kalliath, O'Driscoll, Gillespie, & Bluedorn, 2000). Also, some researchers (e.g., Cordes & Dougherty, 1993) have contended that the inconsistent relationships may be associated with the construct of personal accomplishment having dispositional quality, comparable

to self-efficacy, and thus not representing a distinct characteristic of burnout. Others have suggested that being low on personal accomplishment may also represent an outcome or a consequence of being burned out (Koeske & Koeske, 1989; Shirom, 1989). Thus, based on these arguments, the personal accomplishment construct is not included in the OLBI measure.

The OLBI allows for a more complete measure of exhaustion by assessing all of its key features, namely, affective, cognitive, and physical. The MBI-GS, however, mainly focuses on affective aspect of the exhaustion component, which makes it ineffective at capturing burnout in individuals engaging in primarily physical types of work. For this reason, the OLBI is more appropriate for use with occupationally diverse samples compared to the MBI-GS despite the fact that the latter measure was constructed for use with the general working population (Demerouti, Bakker, Vardakou, & Kantas 2003).

In addition, the OLBI measure contains an even split of items being worded positively and negatively. In case of the MBI-GS, items for each subscale are worded in one direction, which as past research has shown (e.g., Bouman, Te Brake, Hoogstraten, 2000; Lee & Ashforth, 1990) may potentially result in factors clustering inaccurately. Having positively and negatively worded items as is the case with the OLBI also helps ensure that the two dimensions of burnout (exhaustion and disengagement) are measured such that there are items in both subscales assessing for their opposites or vigor and dedication, respectively. Thus, to assess for burnout, positively worded items are reverse coded (Demerouti, Mostert, & Bakker, 2010). The exhaustion subscale contains eight

items which assess for feelings of emptiness, being overtaxed due to work, having a significant need for rest, and being physically exhausted. A sample item is “After my work, I usually feel worn out and weary” (Demerouti et al., 2010, p. 222). The disengagement subscale contains eight items which assess for general attitude towards work characterized by being distant from content and object of one’s work and having a cynical and negative attitude towards work. A sample item is “It happens more and more often that I talk about my work in a negative way” (Demerouti et al., 2010, p. 222). All items are answered on a four-point scale from 1 (strongly agree) to 4 (strongly disagree). The scores can range from 16 to 64, with higher scores indicating higher burnout (Demerouti et al., 2010).

Reliability and validity. Per Demerouti et al. (2003), the OLBI was developed in Germany and validated with German ($N = 293$) and Greek ($N = 232$) samples consisting of individuals from diverse occupational fields. The authors reported results confirming the scale’s two-factor structure as well as supporting evidence for its convergent and discriminant validity. For instance, the findings showed that the OLBI’s core dimensions of exhaustion and disengagement could be discriminated from similar factors (e.g., mental fatigue and satiation, respectively). Also, both dimensions were associated with closely related items at the conceptual level only such that exhaustion was significantly associated with mental fatigue but not with satiation and disengagement was significantly associated with satiation, but not with mental fatigue (Demerouti et al., 2003).

The OLBI's English version was psychometrically evaluated with two U.S. samples totaling $N = 2,599$ of workers (Halbestleben & Demerouti, 2005). The reported internal consistency of the scale ranged from .74 to .87. Test-retest reliability showed the OLBI scores as observed at Time 1 and Time 2 with 4-month lags being moderately correlated, with .51 and .34 for exhaustion and disengagement, respectively. Also, no significant correlations between non-corresponding scales (e.g. exhaustion measured at Time 1 and disengagement measured at Time 2) were detected. The findings correspond with those reported for the MBI-GS which showed subsequent administrations resulting in lower correlations (e.g., scores ranged from .49 to .70 for emotional exhaustion and from .35 to .49 for depersonalization). In addition, the results supported the OLBI's two-factor structure across the two samples. The OLBI demonstrated discriminant and convergent validity in relation to MBI-GS, as evaluated using the Multitrait-Multimethod Matrix (MTMM) approach (Campbell & Fiske, 1959). The MTMM involved testing the performance of OLBI with the MBI measure to determine how well it assesses specific traits such as those of exhaustion and disengagement. The results indicated the unconstrained (or correlated) model offering the best fit, with both scales being related in terms of measurement of burnout, but at the same time showing independence (Halbestleben & Demerouti, 2005).

Research Questions and Hypotheses

RQ1. Is the relationship between demands of hindrance nature (interpersonal conflict, role conflict, and organizational politics) and burnout moderated by job control?

H₀₁₁: Interpersonal conflict and job control interaction will not be related to burnout so that no joint burnout moderating effect of job control and interpersonal conflict will be detected.

H₁₁₁: Interpersonal conflict and job control interaction will be related to burnout, such that increased levels of job control will weaken the association between interpersonal conflict and burnout.

H₀₁₂: Role conflict and job control interaction will not be related to burnout so that no joint burnout moderating effect of job control and role conflict will be detected.

H₁₁₂: Role conflict and job control interaction will be related to burnout, such that increased levels of job control will weaken the association between role conflict and burnout.

H₀₁₃: Organizational politics and job control interaction will not be related to burnout so that no joint burnout moderating effect of job control and organizational politics will be detected.

H₁₁₃: Organizational politics and job control interaction will be related to burnout, such that increased levels of job control will weaken the association between organizational conflict and burnout.

RQ2. Is the relationship between demands of hindrance nature (interpersonal conflict, role conflict, and organizational politics) and job control combinations and burnout moderated by LOC?

H₀₂₁: Interpersonal conflict, job control, and LOC interaction will not be related to burnout, so that no joint burnout moderating effect of job control and LOC will be detected.

H₁₂₁: Interpersonal conflict, job control, and LOC interaction will be related to burnout, such that increased levels of job control and LOC will weaken the associations between interpersonal conflict and burnout.

H₀₂₂: Role conflict, job control, and LOC interaction will not be related to burnout, so that no joint burnout moderating effect of job control and LOC will be detected.

H₁₂₂: Role conflict, job control, and LOC interaction will be related to burnout, such that increased levels of job control and LOC will weaken the associations between role conflict and burnout.

H₀₂₃: Organizational politics, job control, and LOC interaction will not be related to burnout, so that no joint burnout moderating effect of job control and LOC will be detected.

H₁₂₃: Organizational politics, job control, and LOC interaction will be related to burnout, such that increased levels of job control and LOC will weaken the associations between organizational politics and burnout.

RQ3. Is the relationship between demands of hindrance nature (interpersonal conflict, role conflict, and organizational politics) and job control combinations and burnout moderated by mindfulness?

*H*₀₃₁: Interpersonal conflict, job control, and mindfulness interaction will not be related to burnout, so that no joint burnout moderating effect of job control and mindfulness will be detected.

*H*₁₃₁: Interpersonal conflict, job control, and mindfulness interaction will be related to burnout, such that increased levels of job control and mindfulness will weaken the associations between interpersonal conflict and burnout.

*H*₀₃₂: Role conflict, job control, and mindfulness interaction will not be related to burnout, so that no joint burnout moderating effect of job control and mindfulness will be detected.

*H*₁₃₂: Role conflict, job control, and mindfulness interaction will be related to burnout, such that increased levels of job control and mindfulness will weaken the associations between role conflict and burnout.

*H*₀₃₃: Organizational politics, job control, and mindfulness interaction will not be related to burnout, so that no joint burnout moderating effect of job control and mindfulness will be detected.

*H*₁₃₃: Organizational politics, job control, and mindfulness interaction will be related to burnout, such that increased levels of job control and mindfulness will weaken the associations between organizational politics and burnout.

Data Analysis

I selected a hierarchical multiple regression analysis to test for the main and interaction effects of three types of hindrance job demands (interpersonal conflict, role conflict, and organizational politics), job control, and two moderators (i.e., locus of

control and dispositional mindfulness). Prior to testing for the interaction effects and as recommended by Cohen and Cohen (1983), cross-product terms of standardized independent variables were computed. Because I did not observe a skewed distribution for any of the variables, performing natural logarithmic transformation was not necessary (Kleinbaum, Kupper, Nizam, & Rosenberg, 2014). For each instrument assessing the variables of interest, a Cronbach's alpha test was performed to determine the internal consistency of each measure. Also, in preparation for analysis, correlation coefficient was computed between the variables (job control, hindrance demands, moderators, and burnout) to assess how much the variables are correlated. This test also detects the presence of multicollinearity (or high intercorrelations; Aguinis & Gottfredson, 2010) with none being observed in this study.

I entered the independent variables into the analysis in the following successive steps:

1. First, the control variables of gender, age, and hours worked were entered in an effort to control for any confounding effects.
2. At the second step, a hindrance job demand and job control were entered.
3. At the third step, the two-way interaction term of hindrance demand x job control were entered.
4. At the fourth step, the moderator variable (locus of control or dispositional mindfulness) was entered.
5. At the fifth step, the two-way interaction terms (hindrance job demand x moderator) and (job control x moderator) were entered.

6. At the sixth step, the three-way interaction terms (hindrance job demand x job control x moderator) were entered, respectively.

Threats to Validity

External Validity

Unlike experimental designs (e.g., laboratory or field experiments), survey research allows for investigating phenomena in various natural type of settings. It is possible, therefore, to use survey study results and make generalizations to the population of interest not included in the sample. Such generalizability, also referred to as the study's external validity (Creswell, 2009), however, hinges on how well the study is designed in terms of survey methods and sampling procedures used in data collection (Creswell, 2009).

In this survey study, several threats to the external validity common in all survey research included: the sampling error, coverage error, nonresponse error, and the measurement error (Dooley & Lindner, 2003). The sampling error occurs when the selected sample of respondents does not completely correspond with the population of interest, or in other words, lacks representativeness. While the sampling error cannot be completely eliminated, it is minimized by using probability-based sampling methods and larger sample sizes (Dooley & Lindner, 2003). In this study, however, nonprobability-based sampling strategy (i.e., quota) was used to select respondents. Thus, not all individuals from the target population had an equal chance of being included in this study's sample. Therefore; the sample only resembled the characteristics of the target population, affecting the generalizability of the results.

Coverage error is another threat to the external validity of this study and is present whenever a sampling frame from which respondents are selected does not include all individuals from the target population (Dooley & Lindner, 2003). In this case, the sampling frame was an online panel of self-selected individuals (or volunteers), which despite its large size did not include all members of the population of interest. A complete online and offline sampling frame of all U.S. workers, aged 18 to 65, for instance, does not exist. Despite availability of the Internet, there are people who lack accessibility and some active Internet users may be reluctant to join an online panel due to concerns for privacy of information (Chang & Vowles, 2013). Also, Internet users tend to be younger, more educated, and have higher incomes. Some minorities (e.g., Hispanics) are also less likely to be online (Baker et al., 2010). Thus, the online panelists comprising the sampling frame used in this study likely differed from those in the target population in various relevant characteristics, which places limits on the generalizability of the results.

Nonresponse error may also affect the generalizability of this study's findings. It relates to low response rate due to some individuals failing to complete surveys or provide usable responses which contributes to variability in respondents' true perceptions, beliefs or attitudes being assessed (King & He, 2005). The presence of nonresponse error makes it difficult to draw conclusions and make recommendations as to do so, one must ensure that the results obtained do not differ from those deriving from 100 percent response rate (Dooley & Lindner, 2003). Nonresponse as well as attrition are quite common in online panel surveys. The potential respondents are sent invitations through various forms of messaging (e.g., e-mail, text), but may still ignore them or

forget about them. Also, online panelists complete online surveys quite frequently increasing the risk of nonresponse for some surveys. To help address the nonresponse and attrition biases in online panels, companies, including Dynata regularly offer incentives to help maintain panelists' motivation (Lugtig, Das, & Scherpenzeel, 2014; ESOMAR, 2018). In addition, Dynata routinely implements strategies aimed at increasing data quality such as asking quality control questions during the profiling stage, identifying potential "problem respondents," and restricting solicitation whenever appropriate. The company also provides guidance in survey questionnaire design which is important in obtaining quality responses (ESOMAR, 2018).

Finally, the measurement error which relates to the measurement of study's constructs, the mode of interview, and the respondents themselves represents a potential threat to this study's validity (Baker et al., 2010). Issues such as instruments' inadequate validity (instruments fail to measure what they are designed to measure) and reliability (instruments fail to produce consistent results) and poorly designed questionnaires (e.g., questions and answers being ordered illogically or inconsistently) may introduce measurement error (Ponto, 2015). Another source of such error includes the very mode of survey administration which in this study was computer aided self-administration. Research findings suggest that the mode of survey administration may at times affect the answers provided and their quality (Baker et al., 2010). In addition, despite online panelists demonstrating greater reporting accuracy compared to telephone interview respondents (Chang & Krosnick, 2010), they are more likely to engage in behaviors affecting data quality and thus, the validity of the findings. For instance, satisficing is one

concerning issue related to respondents using less cognitive effort in answering survey questions by responding quickly or randomly (Baker et al., 2010). This may lead to inflated reliability and validity of measures used in the study (Hamby & Taylor, 2016). Another issue may be that of professional responding, which involves online panelists attempting to complete as many surveys as possible to obtain associated rewards (Callegaro et al., 2014). Research findings show, however, that the effect of such responding on data quality is of low magnitude (Greszki, Myer, & Schoen, 2014).

Internal Validity

Although internal validity of the study generally relates to experimental designs in which inferences are made about the cause – effect relationships (Creswell, 2009), it is still important in correlational research in which the strength of relationships between variables is being evaluated. Although observed correlations do not imply causation (Creswell, 2009), researchers still want to identify and address certain factors known for affecting the relations between any set of variables. In this study, for instance, I controlled for factors such as age and gender as these have been previously found to influence the findings (e.g., Fila, Purl, & Griffeth, 2017). Also, the moderating role of LOC and mindfulness was investigated to better understand the impact of the demand-job control interaction on strain (i.e. burnout). Such moderators are individual characteristics known to impact people's adaptivity to stress (e.g., Ng, Sorensen, & Eby, 2006; Garland et al., 2009), and thus may better explain the effect of the key (buffering) variable of job control, as posited by the JDC model (Karasek, 1979) tested in this study.

Also, using a more powerful moderated regression analysis (Cohen & Cohen, 1983) compared to the analysis of variance added to the internal validity of this study. Here, the measurement error discussed above is important (could pose a threat to the validity of the results), especially when unreliable measures are used resulting in biased coefficients. Also, the threat posed by measurement error is especially concerning when interaction terms are used (Jaccard & Wan, 1995). In this study, I selected all measures carefully and while all reported adequate validity and reliability, for some such as the FAS (Spector & Fox, 2003), additional validation research would strengthen the confidence in reported data.

Ethical Considerations

There are several important ethical issues that were considered in this study. First, I provided potential participants with informed consent to ensure that they are informed about the study (e.g., purpose, procedures such as the selections process), any potential risks (e.g., discomfort) and benefits (e.g., helping to increase knowledge on occupational stress and coping), including the voluntary nature of survey completion and the right to withdraw at any time. Confidentiality of information was also addressed by informing participants that their identifying information (e.g., names) will not be revealed to me and will be kept confidential by the panel company, as delineated in the agreement when joining the online panel. Dynata follows the professional guideline set by the International Organization for Standardization (ISO; 26362:2009) (Callegaro et al., 2014) for the double opt-in process, which entails potential panelists providing consent at two separate occasions. The first consent is obtained when invited to become a member of an

online panel and the second consent is obtained when a panelist agrees to do a survey (ESOMAR, 2018).

The data collected from the online questionnaire did not include any identifying information and will be stored and maintained by me for a period of 5 years, as recommended by Walden University (Walden University, 2011). Also, the information was stored on a personal computer and with a password protected access. Finally, permission to conduct this investigation was obtained from Walden University's Institutional Review Board and no data were collected prior to the official approval.

Summary

Chapter 3 included a detailed description of research methods used in this study. A cross-sectional research design was presented, followed by a nonprobability- based panel sampling strategy and quota sampling design. Procedures and data collection as well as the data analysis and ethical considerations were also discussed. Special attention was given to validity studies supporting selected instruments to measure the main variables in this study. Any limitations pertaining to validity of the measures were identified and a rationale was provided for their use in the present investigation.

Chapter 4: Results

Introduction

This study's aim was to test Karasek's (1979) occupational stress model, the JDC model. Central to this inquiry was the model's seminal buffer hypothesis, that predicts a moderating effect of job control on the job demand-strain (i.e., burnout) relationship. As elaborated in Chapter 3, the original environmentally based JDC model was modified and tested with hindrance type of job demands (i.e., interpersonal conflict, role conflict, and organizational politics) as well as two personality variables—LOC and mindfulness—as secondary moderators of the JDC model's key dimensions in prediction of burnout. This chapter presents the results of a hierarchical multiple regression used to test the original and revised JDC model's buffer hypotheses.

Research Questions and Hypotheses

RQ1. Is the relationship between demands of hindrance nature (interpersonal conflict, role conflict, and organizational politics) and burnout moderated by job control?

H₀₁: Interpersonal conflict and job control interaction will not be related to burnout so that no joint burnout moderating effect of job control and interpersonal conflict will be detected.

H₁₁: Interpersonal conflict and job control interaction will be related to burnout, such that high levels of job control will weaken the association between interpersonal conflict and burnout.

H₀₁₂: Role conflict and job control interaction will not be related to burnout so that no joint burnout moderating effect of job control and role conflict will be detected.

H₁₁₂: Role conflict and job control interaction will be related to burnout, such that high levels of job control will weaken the association between role conflict and burnout.

H₀₁₃: Organizational politics and job control interaction will not be related to burnout so that no joint burnout moderating effect of job control and organizational politics will be detected.

H₁₁₃: Organizational politics and job control interaction will be related to burnout, such that high levels of job control will weaken the association between organizational conflict and burnout.

RQ2. Is the relationship between demands of hindrance nature (interpersonal conflict, role conflict, and organizational politics) and job control combinations and burnout moderated by LOC?

H₀₂₁: Interpersonal conflict, job control, and LOC interaction will not be related to burnout, so that no joint burnout moderating effect of job control and LOC will be detected.

H₁₂₁: Interpersonal conflict, job control, and LOC interaction will be related to burnout, such that high levels of job control and LOC will weaken the associations between interpersonal conflict and burnout.

H₀₂: Role conflict, job control, and LOC interaction will not be related to burnout, so that no joint burnout moderating effect of job control and LOC will be detected.

H₁₂: Role conflict, job control, and LOC interaction will be related to burnout, such that high levels of job control and LOC will weaken the associations between role conflict and burnout.

H₀₃: Organizational politics, job control, and LOC interaction will not be related to burnout, so that no joint burnout moderating effect of job control and LOC will be detected.

H₁₃: Organizational politics, job control, and LOC interaction will be related to burnout, such that high levels of job control and LOC will weaken the associations between organizational politics and burnout.

RQ3. Is the relationship between demands of hindrance nature (interpersonal conflict, role conflict, and organizational politics) and job control combinations and burnout moderated by mindfulness?

H₀₃₁: Interpersonal conflict, job control, and mindfulness interaction will not be related to burnout, so that no joint burnout moderating effect of job control and mindfulness will be detected.

H₁₃₁: Interpersonal conflict, job control, and mindfulness interaction will be related to burnout, such that high levels of job control and mindfulness will weaken the associations between interpersonal conflict and burnout.

*H*₀₃₂: Role conflict, job control, and mindfulness interaction will not be related to burnout, so that no joint burnout moderating effect of job control and mindfulness will be detected.

*H*₁₃₂: Role conflict, job control, and mindfulness interaction will be related to burnout, such that high levels of job control and mindfulness will weaken the associations between role conflict and burnout.

*H*₀₃₃: Organizational politics, job control, and mindfulness interaction will not be related to burnout, so that no joint burnout moderating effect of job control and mindfulness will be detected.

*H*₁₃₃: Organizational politics, job control, and mindfulness interaction will be related to burnout, such that high levels of job control and mindfulness will weaken the associations between organizational politics and burnout.

Data Collection

Sample Characteristics

Upon IRB approval, the respondents for this study were recruited using Dynata, an online research panel company capable of reaching diverse panelists from across the globe. This form of recruitment has been commonly employed in prior research (e.g., Dawson et al., 2014; Strauss, Griffin, & Parker, 2012). Due to the online panel being nonprobability-based, a quota sampling design was used to maximize sample representativeness. The quota, or the highest number of participants needed for a particular subgroup within the target population, was based on the following attributes: U.S. employed adults (ages 18–65) from diverse professions (e.g., healthcare, education,

for-profit), working a minimum of 30 hours per week, 50% female and 50% male, and culturally diverse to reflect the current census, which is 76.5% White/Caucasian, 13.2% Black/African American, and a remaining mix of other minorities.

A total of $N = 300$ respondents completed the online survey questionnaire for this study. Only those consenting to participate and meeting the sample characteristics, as outlined above, took part in this research. Respondents' level of education and geographic region information were also collected. All the demographic variables of the current sample are outlined in Table 1. As illustrated, the quota for each subgroup within the sample has been met. The sample consisted of a 50/50 split of female and male participants; there were 150 women and 150 men. The minimum age of respondents was 18 and the maximum age was 64, with a mean of 40.81 years ($SD = 12.98$). The sample was also culturally diverse, closely resembling the current U.S. census. The majority (77%) of respondents were White/Caucasian, 13% were Black/African American, 18% indicated being Hispanic, 1.3% were American Indian or Alaska Native, 5.7% were Asian, and 3% were of other racial/ethnic backgrounds. The participants were employed in various professions, with the largest number (47%) holding positions at "for profit" organizations, followed by 11.3% of individuals working in the healthcare industry, 10.7% working in education, 7.3% working for nonprofit organizations, and 7.3% working for the government organizations. In terms of weekly work hours, all participants met the minimum of 30 hours a week requirement. In addition, many had attained higher level of education, with 53% having earned an associate's, bachelor's, or

master's degree. As for the geographic location of participants, the largest number (36.7%) originated from the Southern region of the United States.

Table 1

Demographic Characteristics of the Study Participants (N = 300)

Variable	<i>n</i>	Percent
Gender		
Female	150	50
Male	150	50
Age groups		
18-34 years old	111	37
35-44 years old	63	21
45-54 years old	69	23
55-64 years old	57	19
Race/ethnicity		
White	231	77
Black/African American	39	13
American Indian or Alaska Native	4	1.3
Asian	17	5.7
Other	9	3
Hispanic	54	18
Hours worked		
30-35 hours	60	20
36-40 hours	60	20
41-45 hours	60	20
46-50 hours	60	20
51+ hours	60	20
Profession		
For profit	141	47
Nonprofit	22	7.3
Government	22	7.3
Healthcare	34	11.3
Education	32	10.7
Other	49	16.3
Education level		
Less than high school	2	0.7
High school/GED	47	15.7
Some college/no degree	54	18
Associate degree	38	12.7
Bachelor's degree	87	29
Master's degree	56	18.7

Variable	n	Percent
Region		
Northeast	58	19.3
South	110	36.7
West	68	22.7
Midwest	64	21.3

Preliminary Analyses

Prior to preliminary analyses, coding and scoring of measures comprising the online survey questionnaire for this study and assessing the independent variables, moderators, and the dependent variable was performed in accordance with instructions for each instrument. The independent variables representing hindrance job demands included interpersonal conflict, which was measured using ICAWS (Spector & Jex, 1998); role conflict, which was measured with RCS (Bowling et al., 2017); and organizational politics, which was evaluated using POPS (Kacmar & Carlson, 1997). The moderators were job control, which was assessed with FAS (Spector & Fox, 2003); LOC, which was assessed with I-E (Rotter, 1966); and dispositional mindfulness, which was measured with the MAAS (Brown & Ryan, 2003). The dependent variable of burnout was evaluated using OLBI (Halbesleben & Demerouti, 2005).

The focus of the initial analyses was to compute the means, standard deviation, *Cronbach's* alpha, and zero-order *Pearson* correlations between the key study variables, which are displayed in Table 2 (Internal LOC Group) and Table 3 (External LOC Group). I performed separate analyses for the internal ($n = 204$) and external ($n = 96$) LOC construct to evaluate for the expected relations with other study variables. As per instructions for the I-E scale (Rotter, 1966), respondents who scored less than 13 were categorized as having internal LOC, and those who scored 13 or higher were categorized

as having external LOC. This grouping was especially important in determining whether it would be useful to perform a separate regression analysis for the external LOC group, which was found to be much smaller compared to the internal LOC group. According to the conducted sample size calculations using power analysis described in Chapter 3 and recommendations by researchers (e.g., Miles & Shevlih, 2001), a minimum of 145 participants was needed to conduct a regression analysis in this study. Therefore, a hierarchical regression analysis selected to test for the moderation effects was not performed on the external LOC group.

The internal LOC had a mean value of 9.30 and the external LOC had a mean value of 14.83. For the internal LOC respondent group ($n = 204$), majority of the Cronbach's α were acceptable (Cohen, 1992) and comparable to or higher than previously published consistencies. For example, mindfulness (MAAS) had the α value of .97 which is higher than the previously published values of .82 (student sample) and .87 (community sample) (Brown & Ryan, 2003). Similarly, interpersonal conflict (ICAWS) had the α value of .91, which is higher than the value of .74 reported by Spector and Jex (1998) in their validation research. The organizational politics variable (POPS) had the α coefficient of .80 which is close to the previously published result of .81 (Kacmar & Carlson, 1997). The lower than generally accepted α of .55 for internal LOC could be explained by the dichotomous variables in the instrument (Sun et al., 2007). It is important to note that the initial Cronbach's α for the role conflict (RC) scale was .55 and closer inspection of the measure revealed odd performance of the items (i.e., after reverse scoring of scale Items 4, 5, and 6, correlations between items were

negative). Thus, as per recommendation by Dr. N. A. Bowling (personal communication, October 22, 2019) only the positively scored items of the RC scale were used and the newly computed Cronbach's α was .82 and .81 for the internal and external LOC group, respectively. For the remaining measures, the external LOC respondent group ($n = 96$) had similar Cronbach's α coefficients to those computed for the internal LOC respondent group.

The zero-order Pearson correlations between the independent, moderator, and dependent variables were also evaluated for the internal and external LOC groups. For the internal LOC respondent group ($n = 204$), statistically significant correlations were found between the dependent variable and the independent variables and the moderators. For example, the organizational politics (POPS) had a statistically significant correlation with burnout (OLBI), ($r = .53, p < .01$). Also, a statistically significant relationship was observed between burnout (OLBI) and mindfulness (MAAS) ($r = -.47, p < .01$). Interestingly, a statistically significant positive correlation was observed between burnout (OLBI) and internal LOC ($r = .28, p < .01$). This finding suggests an inverse U-shaped relationship between these variables (Johnston et al., 2013). For the external LOC group ($n = 96$), the results showed that correlations between interpersonal conflict (ICAWS) and two other variables of External LOC and burnout (OLBI) were not statistically significant ($r = .06, p = .51$; $r = .15, p = .14$, *respectively*). Also, the correlation between external LOC and mindfulness (MAAS) was not statistically significant ($r = -.08, p = .47$). In addition, the correlation between role conflict (RC) and external LOC was not statistically significant ($r = .19, p = 0.06$). The lack of

statistically significant correlations between key variables in the external LOC group in addition to a small sample size discussed earlier further supported performing the regression analysis on the internal LOC group only.

For the mindfulness construct, it was not necessary to create separate groups, therefore, the entire sample ($N = 300$) was used to evaluate the relationship between job demands, moderators (job control and mindfulness) and burnout. Table 4 outlines the correlations between these variables. As presented, mindfulness had a mean value of 3.53. The majority of Cronbach's α were acceptable (Cohen, 1992) and ranged from .79 for organizational politics (POPS) to .96 for mindfulness (MAAS).

The zero-order Pearson correlations between the job demands and burnout were as follows: interpersonal conflict (ICAWS) ($r = .31, p < .01$), organizational politics (POPS) ($r = .52, p < .01$), and role conflict (RC) ($r = .37, p < .01$). These correlations clearly demonstrated that POPS most strongly correlated with the burnout construct compared to the other two job demands. Such a relationship was reported in previous research. For example, the Dawson et al. (2016) study found that compared to job demands of interpersonal conflict and role conflict, organizational politics had the strongest association with the emotional exhaustion component of burnout. The correlations between mindfulness and the three job demands were as follows: interpersonal conflict (ICAWS) ($r = -.56, p < .01$), organizational politics (POPS) ($r = -.51, p < .01$), and role conflict (RC) ($r = -.43, p < .01$). These results pointed to role conflict (RC) having the weakest association with mindfulness.

Table 2

Correlation Matrix for Internal LOC Group (n = 204)

Variable	Mean	SD	Alpha	ICAWS	POPS	RCS	FAS	Internal LOC	MAAS	OLBI
ICAWS	7.61	4.65	0.91	1	.526**	0.391	-.626**	.238**	-.559**	.389**
POPS	59.38	13.84	0.8		1	.453**	-.560**	.347**	-.532**	.533**
RCS	12.76	4.65	0.82			1	-.431**	.161*	-.437**	.397**
FAS	34.13	9.99	0.89				1	-.283**	.608**	-.303**
Internal LOC	9.3	2.47	0.55					1	-.315**	.279**
MAAS	3.58	1.33	0.97						1	-.467**
OLBI	37.29	6.41	0.78							1

* $p < .05$; ** $p < .01$

Table 3

Correlation Matrix for External LOC Group (n = 96)

Variable	Mean	SD	Alpha	ICAWS	POPS	RCS	FAS	External LOC	MAAS	OLBI
ICAWS	8.03	4.7	0.92	1	.534**	.466**	-.426**	0.068	-.566**	.152
POPS	61.88	12.61	0.77		1	.527**	-.338**	.403**	-.438**	.476**
RCS	13	4.55	0.81			1	-.345**	0.188	-.433**	.315**
FAS	33.48	10.3	0.9				1	-.232*	.325**	-.221*
External LOC	14.83	1.82	0.5					1	-0.075	.501**
MAAS	3.41	1.15	0.94						1	-.294**
OLBI	39.96	6.97	0.78							1

* $p < .05$; ** $p < .01$

Table 4

Correlation Matrix for Mindfulness Group (N = 300)

Variable	Mean	SD	Alpha	ICAWS	POPS	RCS	FAS	MAAS	OLBI
ICAWS	7.74	4.67	0.91	1	.529**	.415**	-.561**	-.561**	.311**
POPS	60.18	13.49	0.79		1	.474**	-.492**	-.509**	.519**
RCS	12.84	4.62	0.82			1	-.403**	-.436**	.368**
FAS	33.93	10.08	0.90				1	.523**	-.276**
MAAS	3.53	1.28	0.96					1	-.415**
OLBI	38.02	6.67	0.78						1

** $p < .01$

Assumptions Tested for Hierarchical Multiple Regression

Several statistical assumptions for hierarchical multiple regression were evaluated and included variable types, multicollinearity, independence, normally distributed errors, linearity, and homoscedasticity (Field, 2013). The assumption of variable types indicate that the predictor variables must be categorical or quantitative and the outcome variable must be quantitative, continuous, and unbounded. This assumption was supported in that all the predictor variables were continuous or categorical and the dependent variable was continuous. The assumption of multicollinearity or the absence of a perfect linear relationship between two or more predictors was also met. In the models, if the predictors have the tolerance value greater than 0.2, it would indicate multicollinearity (Menard, 1995). None of the predictors had a tolerance value greater than 0.2, therefore, variables were not correlated too highly. Thus, it can be stated that the models did not have multicollinearity problem. The assumption of independence which pertains to all the values of the outcome variable being independent or deriving from distinct entity was also satisfied. In the data set used for analyses, each value of the dependent variable came from independent respondents.

The assumption of normally distributed errors states that the residuals in the model should be random, with normally distributed variables with a mean value of 0. Normality tests of the models provided support for this assumption revealing the dependent variable of burnout being normally distributed with a mean value of 38.01 and $SD = 6.67$. The assumption of linearity highlights the need for the outcome variable being linearly related to any predictors. The visual examination of the plot of standardized

residuals against the dependent variable of burnout revealed support for this assumption. Finally, the assumption of homoscedasticity or the variance of errors being constant at each level of the independent variable was also fulfilled. The generated plots (see Appendices A and B) clearly displayed a random array of residuals, evenly dispersed around zero.

Data Analysis

I conducted hierarchical multiple regression analyses to test for main and interactive effects of hindrance job demands (IC, RC, and POPS), job control (primary moderator), and LOC and mindfulness (two secondary moderators) on burnout. In order to test for the moderating effects, cross product terms of standardized independent variables were computed (Cohen & Cohen, 1983). I entered the variables into the regression equation using the six-step procedure developed by Aiken and West (1991), which has been commonly employed in previous research testing the JDC model (e.g., de Rijik et al., 1998; Parkes, 1991). In the first step, control variables of age, sex, and hours worked were entered to manage for likely confounding effects. In the second step, job demands and job control were entered to examine the main effects of these variables. In the third step, the two-way interaction term of job demands and job control (demands \times control) was entered. In the fourth step, the moderator was entered (i.e., locus of control or mindfulness). And in the fifth and sixth step, the two-way interaction terms (demands \times moderator and control \times moderator) and three-way interaction term (demands \times control \times moderator) were entered, respectively. It is important to note that the two, two-way interaction terms (Step 5 of the equation) were not hypothesized in this study because

they are not based on JDC model's theory (i.e., the buffer hypothesis). They were included in the analyses on exploratory basis, as recommended by Aiken and West (1991).

I conducted separate hierarchical multiple regression analyses for the three types of job demands and the two moderators (LOC and mindfulness) yielding a total of six models. Due to failure to detect any significant two-way and three-way interaction effects for the moderator of LOC and the possibility of a curvilinear relationship between internal LOC and burnout, I performed tests of nonlinear relationships for the three job demands. In addition, I conducted exploratory analyses for both, the LOC and mindfulness moderators that focused exclusively on testing the hypothesized three-way interaction effects.

All significant interactions were evaluated with additional analyses to enhance understanding of their nature and form. I accomplished this by examining the effects graphically by using the simple slope method described by Jaccard and Turrisi (2003). In particular, Z -values of main predictors (job demands and moderators) were selected at the "low," "medium," and "high" levels ($-1 SD$ below the mean, around the mean, and $+1 SD$ above the mean, respectively). The values of burnout were the predicted mean values of burnout scores from the regression model. I then generated simple regression lines by inserting all values into the regression equation. Nonparallel lines were indicative of an interaction effect.

Only two-way and three-way interaction effects consistent with JDC model and this study's hypotheses were evaluated further. For these analyses, I employed another

post hoc probing technique recommended by Cohen, Cohen, West, and Aiken (2015).

The method involved testing the statistical significance of the slopes of the simple regression lines, which delineated associations between varying levels of job demands, job control, any of the moderators, and burnout. The testing assisted in determining whether the results confirmed or refuted the hypothesized moderating effects.

Regression Analyses: Moderator of Locus of Control (LOC; $n = 204$)

RQ1 and RQ2

RQ1 asked whether the relationship between demands of hindrance nature (IC, RC, and POPS) and burnout would be moderated by job control. RQ2 asked whether the relationship between demands of hindrance nature (IC, RC, and POPS) and job control combinations and burnout would be moderated by LOC.

Job Demand of Interpersonal Conflict

For the IC job demand, the corresponding hypothesis 1₁ predicted a primary moderating influence of job control on the IC-burnout relationship, which would be statistically represented in a significant two-way, IC \times job control interaction term. High job control was expected to synergistically combine with high IC, such that higher levels of job control would weaken the relationship between IC and burnout. The corresponding hypothesis 2₁ predicted a secondary moderating influence of LOC on the IC/job control-burnout relationship, which would be statistically represented in a significant three-way, IC \times job control \times LOC interaction term. High job control was expected to synergistically combine with high IC and high LOC, such that higher levels of job control and LOC would weaken the relationship between IC and burnout. Table 5 contains findings from

the regression analysis performed for the IC job demand, job control, and LOC on burnout.

Interpersonal Conflict Results

The first two steps of the analyses evaluated control and main effects of the IC job demand and job control. Age entered at first step of the equation was not a statistically significant predictor ($B = -0.415, p = .290$). Sex and hours worked entered next were also nonsignificant ($B = 1.019, p = .222$; $B = -0.091, p = .762, respectively$). At the second step, the main effects were evaluated and while job control was nonsignificant ($B = -0.019, p = .768$), IC was a significant and positive predictor ($B = 0.470, p < .05$), indicating that high IC scores predicted high burnout scores. IC along with job control (Step 2) explained 12.1% of the variance in burnout scores over and above the effects of age, sex, and hours worked.

The second part of the regression analysis tested the primary moderating role of job control and the secondary moderating role of LOC. The IC \times job control interaction term entered into the third step of the equation was not statistically significant ($B = 0.663, p = .124$). This finding fails to support hypothesis 1₁, which predicted that job control would moderate the IC and burnout relationship. The secondary moderating effect of LOC was evaluated next, with LOC being entered in step four, followed by two-way interaction terms of IC \times LOC and job control \times LOC (Step 5) and three-way interaction term of IC \times job control \times LOC (Step 6). The results showed that the effect of LOC was not significant ($B = 0.138, p = .584$) and the two-way IC \times LOC and job control \times LOC interaction terms were also not significant ($B =$

$-1.441, p = .211; B = -0.287, p = .743, respectively$). Finally, the three-way interaction term, $IC \times \text{job control} \times \text{LOC}$ was also nonsignificant ($B = -0.686, p = .316$). This finding fails to support hypothesis 2₁, which predicted that LOC would moderate the IC/job control and burnout relationship. Overall, the model was able to explain 23.3% of variability in burnout ($R^2 = 0.233, F(10, 193) = 5.854, p < .05$). The results indicated that the IC model was statistically significant.

Table 5

Hierarchical Multiple Regression Analyses of Job Demands (Interpersonal Conflict, Role Conflict and Organizational Politics), Job Control, and Locus of Control on Burnout (n = 204)

Predictor	Job demands					
	Interpersonal conflict (IC)		Role conflict (RC)		Organizational politics (POPS)	
	B	R ² Change	B	R ² Change	B	R ² Change
1 Age	-0.415	0.059*	-0.729**	0.059*	-0.612	0.059*
Sex	1.019		1.258		0.425	
Hours Worked	-0.091		-0.153		-0.126	
2 Job Demand	0.470*	0.121*	0.416*	0.162*	0.233*	0.243*
Job Control	-0.019		-0.061		0.032	
3 Job Demand x Job Control	0.663	0.026*	0.554	0.011	0.438	0.005
4 LOC (Moderator)	0.138	0.017*	0.404*	0.020*	0.204	0.005
5 Job Demand x Moderator	-1.441	0.005	-0.629	0.004	0.163	0.002
Job Control x Moderator	-0.287		0.089		0.474	
6 Job Demand x Job Control x Moderator	-0.686	0.004	0.306	0.001	0.132	0.000
Multiple R	0.482		0.507		0.561	
R ²	0.233*		0.257		0.315	
F	5.854*		6.672*		8.878*	

Note. * $p < .05$; ** $p < .10$. The B values represent coefficients from the last stage of the regression analysis.

Job Demand of Role Conflict

For the RC job demand, the corresponding hypothesis 1₂ predicted a primary moderating influence of job control on the RC-burnout relationship, which would be

statistically represented in a significant two-way, $RC \times$ job control interaction term. High job control was expected to synergistically combine with high RC, such that higher levels of job control would weaken the relationship between RC and burnout. The corresponding hypothesis 2₂ predicted a secondary moderating influence of LOC on the RC/job control-burnout relationship, which would be statistically represented in a significant three-way, $RC \times$ job control \times LOC interaction term. High job control was expected to synergistically combine with RC and high LOC, such that higher levels of job control and LOC would weaken the relationship between RC and burnout. Table 5 contains findings from the regression analysis performed for the RC job demand, job control, and LOC on burnout.

Role Conflict Results

The first segment of the analysis focused on control and main effects of role conflict job demand and job control. In terms of control effects, age entered into the first step of the equation was a statistically significant and negative predictor ($B = -0.729, p < .10$), indicating that older respondents tended to have lower burnout scores. Both, sex and hours worked entered next were nonsignificant predictors ($B = 1.258, p = .127; B = -0.153, p = .605, respectively$). At the next step, the main effects were tested and while job control was nonsignificant ($B = -0.061, p = .318$), RC was a significant and positive predictor ($B = 0.416, p < .05$), revealing that high RC scores predicted high burnout scores. Together, the predictors accounted for 22.1% of the variance in burnout scores, with RC along with job control (Step 2) being the largest contributor (16.2%).

In subsequent stages of the analysis, the primary moderating role of job control and the secondary moderating role of LOC were tested. At step three of the equation, the $RC \times$ job control term was not significant ($B = 0.554, p = .292$). This finding fails to support the main moderating influence of job control on the RC and burnout relationship, as outlined in hypothesis 1₂. Next, the moderating role of LOC was examined by entering the LOC score in step four, followed by two-way interaction terms of $RC \times$ LOC and job control \times LOC (Step 5) and three-way interaction term of $RC \times$ job control \times LOC (Step 6). The results indicated that LOC was a significant and positive predictor ($B = 0.404, p < .05$), adding 2.0% to the variance in burnout. However, the two interaction terms, $RC \times$ LOC and job control \times LOC were nonsignificant ($B = -0.629, p = .356$; $B = 0.089, p = .895, respectively$). Similarly, the three-way, $RC \times$ job control \times LOC interaction term was also nonsignificant ($B = 0.306, p = .593$). This finding does not support hypothesis 2₂, which predicted that LOC would moderate the RC/job control and burnout relationship. The RC model accounted for 25.7% of variability in burnout scores ($R^2 = 0.257, F(10, 193) = 6.672, p < .05$). The results indicated that the RC model was statistically significant.

Job Demand of Perception of Organizational Politics

For the POPS job demand, the corresponding hypothesis 1₃ predicted a primary moderating influence of job control on the POPS-burnout relationship, which would be statistically represented in a significant two-way, $POPS \times$ job control interaction term. High job control was expected to synergistically combine with high POPS, such that higher levels of job control would weaken the relationship between POPS and burnout.

The corresponding hypothesis 2₃ predicted a secondary moderating influence of LOC on the POPS/job control-burnout relationship, which would be statistically represented in a significant three-way, POPS \times job control \times LOC interaction term. High job control was expected to synergistically combine with POPS and high LOC, such that higher levels of job control and LOC would weaken the relationship between POPS and burnout. Table 5 contains findings from the regression analysis performed for the POPS job demand, job control, and LOC on burnout.

Perception of Organizational Politics Results

As in the analyses for the other two demands, the first part examined control and main effects of POPS job demand and job control. For control effects, age entered first was not a statistically significant predictor ($B = -0.612, p = .096$) and both sex and hours worked were nonsignificant ($B = 0.425, p = .587$; $B = -0.126, p = .656, respectively$). At step two, the main effects were tested and while job control was nonsignificant ($B = 0.032, p = .631$), POPS was a significant and positive predictor ($B = 0.233, p < .05$), accounting for 24.3% of variance in burnout scores over and above the effects of control variables.

The second segment of the analysis tested the primary moderating effect of job control and the secondary moderating effect of LOC. The POPS \times job control interaction term entered at step three was not significant ($B = 0.438, p = .428$). This result, therefore, fails to support hypothesis 1₃, which predicted that job control would moderate the POPS and burnout relationship. The secondary moderating role of LOC was also evaluated by entering its score in step four, followed by two-way interaction terms, POPS

× LOC and job control × LOC (Step 5) and three- way interaction term, POPS × job control × LOC (Step 6). The results showed that LOC was nonsignificant ($B = 0.204, p = .291$), including the two-interaction terms of POPS × LOC and job control × LOC ($B = 0.163, p = 0.804$; $B = 0.474, p = .631, p = .503, respectively$). Similarly, the three-way interaction term of POPS × job control × LOC was nonsignificant ($B = 0.132, p = .811$). This result fails to support hypothesis 2₃, which predicted that LOC would moderate the POPS/job control and burnout relationship. Overall, the POPS model was statistically significant and explained 31.5% of variability in burnout scores ($R^2 = 0.315, F(10, 193) = 8.878, p < .05$).

Testing for Nonlinear Effects

The above findings indicate that job control on its own and in combination with LOC failed to moderate the effects of three different job demands (IC, RC, and POPS) in relation to burnout. However, the analyses performed tested for linear relationships among the key variables, excluding the possibility of nonlinear relationships. Some authors (Grant & Schwartz, 2011; Warr, 1990) and past research findings (e.g., Johnston et al., 2013) suggest that the relations between work variables, including personality traits and well-being may be of nonlinear character. Indeed, the preliminary findings of this study revealed that internal LOC was positively correlated with burnout ($r = .28, p < .01$), pointing to the possibility of an inverse U-shaped type of relationship between the two variables. Thus, it was imperative to test for nonlinear effects to increase the possibility of detecting the hypothesized moderating effects (Ganzach, 1997; Fletcher & Jones, 1993). Based on recommendations made by Ganzach (1997), testing for

interaction effects was revised by inclusion of a quadratic term of internal LOC into the regression analysis which was performed separately for each job demand.

As in previous analyses, the variables were entered into the equation in six successive steps: age, sex, and hours worked (Step 1), job demand and job control (Step 2), job demand \times job control interaction term (Step 3), quadratic term of internal LOC (Step 4), two -way interaction terms of job demand \times quadratic term of LOC and job control \times quadratic term of LOC (Step 5), and finally, three-way interaction term of job demand \times job control \times quadratic term of LOC (Step 6). The results from regression analyses for all three job demands are presented in Table 6.

Interpersonal Conflict Results

For the job demand of IC, results for control and main effects were similar to those obtained in the previous model. None of the control variables were found to be significant and only the main effect of IC was significant ($B = 0.604, p < .05$), which along with job control explained 12.1% of the variance in burnout scores. Tests of the moderating effects (part two of the analysis), however, revealed one significant two-way, IC \times job control interaction term ($B = 0.949, p < .05$), which added 2.6% to the variance in burnout. This interaction was not in the expected direction because the interactive effect of IC and job control increased, rather than decreased burnout scores. Therefore, hypothesis 1₁ was not supported. The quadratic term of LOC was found to be nonsignificant ($B = 0.011, p = .434$) and the three-way, IC \times job control \times quadratic term of LOC interaction was nonsignificant ($B = -0.405, p = .373$). Thus, the findings failed to confirm hypothesis 2₁, which proposed that LOC would moderate the

IC/job control and burnout relationship. There were no significant curvilinear effects found in the IC model. Overall, the model was statistically significant and explained 23% of variability in burnout scores ($R^2 = 0.230, F(10, 193) = 5.760, p < .05$).

Table 6

Hierarchical Multiple Regression Analyses of Job Demands (Interpersonal Conflict, Role Conflict, and Organizational Politics), Job Control, and Quadratic Locus of Control on Burnout (n = 204)

Predictor	Job demands					
	Interpersonal conflict (IC)		Role conflict (RC)		Organizational politics (POPS)	
	B	R^2 Change	B	R^2 Change	B	R^2 Change
1 Age	-0.492	0.059*	-0.743**	0.059*	-0.624**	0.059*
Sex	1.025		1.260		0.423	
Hours Worked	-0.081		-0.147		-0.121	
2 Job Demand	0.604*	0.121*	0.480*	0.162*	0.229*	0.243*
Job Control	-0.009		-0.064		0.010	
3 Job Demand x Job Control	0.949*	0.026*	0.354	0.011*	0.345	0.005
4 Quadratic term of Internal LOC (Moderator)	0.011	0.015**	0.023*	0.017*	0.011	0.004
5 Job Demand x Quadratic Term of Moderator	-0.761	0.005	-0.503	0.007	0.161	0.003
Job Control x Quadratic Term of Moderator	0.044		0.143		0.432	
6 Job Demand x Job Control x Quadratic Term of Moderator	-0.405	0.003	0.166	0.001	0.052	0.000
Multiple R	0.479		0.506		0.561	
R^2	0.230		0.256		0.315	
F	5.760		6.647*		8.885*	

Note. * $p < .05$; ** $p < .10$. The *B* values represent coefficients from the last stage of the regression analysis.

Graphical Representation of Two-Way, Interpersonal Conflict × Job Control

Interaction

As mentioned earlier, the IC × job control interaction was such that increasing levels of control did not buffer against the negative effects of IC, but rather increased burnout. To understand the nature and form of the IC × job control interaction, I

evaluated the effect graphically by using the simple slopes method described before. More specifically, I selected Z -values of IC and job control at the “low,” “medium,” and “high” levels ($-1 SD$ below the mean, around the mean, and $+1 SD$ above the mean, respectively), with the outcome variable representing the predicted mean values of burnout from the regression model. I plotted the interaction and the results are displayed in Figure 2. As clearly illustrated, the interaction occurred at high level of job control and medium to high levels of IC, leading to increase in burnout scores. Thus, the interaction was not in line with the JDC model’s buffer hypothesis, as specified in hypothesis 1₁. Higher job control levels did not weaken the association between high IC and burnout, but rather strengthened it.

To evaluate this result further, I performed a post hoc probing of the IC x job control interaction, which involved tests of significance of simple slopes (Cohen, et al., 2015). As expected, the results indicated that for the relationship between high job control and high IC, the slope was not statistically significant (simple slope = .104, $p = .321$), showing an increase in burnout. This finding confirms the results of simple slope probing method above, indicating no support for the buffering effect of high job control against high IC job demand. Therefore, hypothesis 1₁ can be confidently refuted.

However, for the relationship between high job control and medium IC, the slope was statistically significant (simple slope = -1.501 , $p < .05$), showing that high levels of job control buffered against moderate levels of IC job demand. Similar, but much stronger buffering effect of job control was found for the relationship between high job control and low IC, as seen in a statistically significant and negative slope (simple slope

= $-4.342, p < .05$). For the relationship between medium job control and medium IC, the slope was not statistically significant (simple slope = $.55, p = .306$). Finally, for the relationship between low job control and high IC, the slope was statistically significant (simple slope = $3.85, p < .05$), indicating an increase in burnout. This finding is in line with JDC model's strain hypothesis, which was not tested in this study, but which predicts strain (i.e., burnout) being the result of low job control and high job demands.

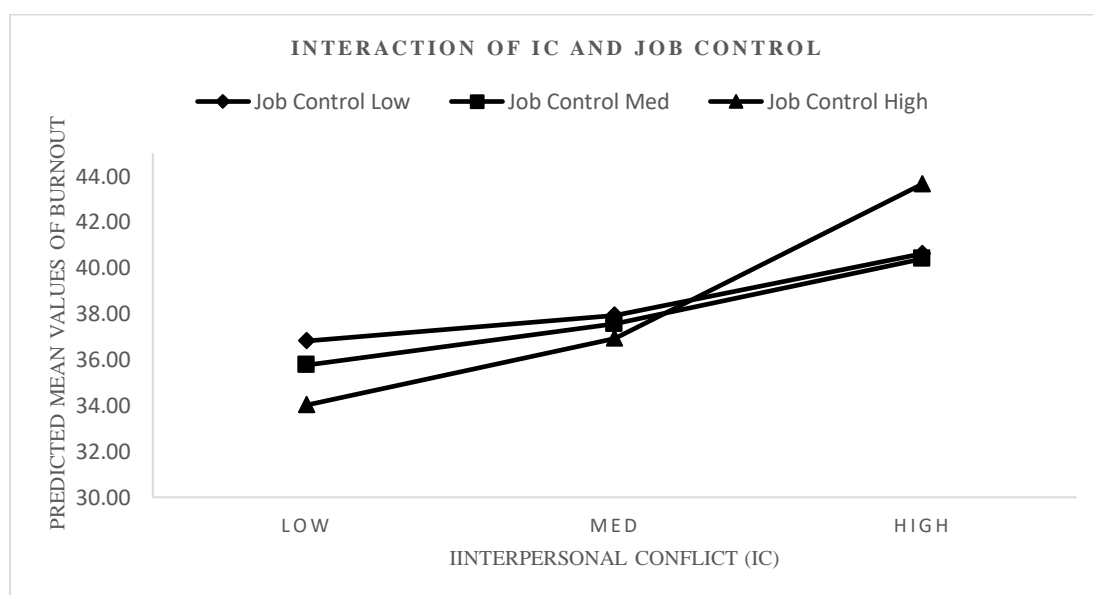


Figure 2. Two-way interaction of IC and job control on burnout.

Role Conflict Results

Same analysis was performed for the job demand of RC and the results are presented in Table 6. As shown, the results for control effects did not differ from those of the linear model in that only age was found to be a statistically significant and negative predictor of burnout ($B = -0.743, p < .10$), revealing that older subjects tended to have lower burnout scores. Jointly, the control variables explained 5.9% of the variance in burnout scores. In terms of the main effects of RC and job control, the result was

similar in that only RC was a significant and positive predictor of burnout ($B = 0.480, p < .05$), and along with job control explained 16.1% of the variance in burnout.

In subsequent analysis focused on testing for moderating effects, none of the two-way interaction terms were significant, including the RC \times job control interaction ($B = 0.354, p = .405$). Thus, the moderating effect of job control, as specified in hypothesis 1₂ was not found. However, the main effect of quadratic LOC term was statistically significant ($B = 0.023, p < .05$), indicating possible curvilinearity. Finally, the three-way, RC \times job control \times quadratic term of LOC interaction was not significant ($B = 0.166, p = .684$). This result failed to support hypothesis 2₂ which predicted that LOC would moderate the RC/job control and burnout association. Overall, the RC model was statistically significant and accounted for 25.6% of the variability in burnout scores ($R^2 = 0.256, F(10, 193) = 6.647, p < .05$).

Perception of Organizational Politics Results

The findings for the POPS demand were similar to those found in the linear model, with some differences concerning the control variables. While in the previous analysis none of the control variables reached significance, in this analysis, age was found to be a statistically significant and negative predictor ($B = -0.624, p < .10$), indicating that older respondents tended to have lower burnout scores. Together, the control variables contributed 5.9% to the variance in burnout scores. In terms of main effects, the results for POPS and job control followed the same pattern in that only POPS

was a significant and positive predictor ($B = 0.229, p < .05$), and explained 24.3% of variance in burnout scores.

The analysis testing for moderator effects revealed no significant two-way interaction terms, including the POPS \times job control interaction ($B = 0.345, p = .419$). This finding, therefore, failed to support the moderating role of job control as specified in hypothesis 1₃. The main contribution of quadratic LOC term was nonsignificant ($B = 0.011, p = .320$). Finally, and as in previous analysis, the three-way, POPS \times job control \times quadratic term of LOC interaction term was nonsignificant ($B = 0.052, p = .894$). Thus, hypothesis 2₃, which proposed that LOC would moderate the POPS/job control and burnout relationship was not supported. There were no significant curvilinear effects found in the POPS model. In sum, the model was statistically significant and explained 31.5% of the variability in burnout scores ($R^2 = 0.315 F(10, 193) = 8.885, p < .05$).

Exploratory Regression Analyses: Locus of Control ($n = 204$)

The inclusion of a quadratic term of LOC in the regression analysis did not improve the results in terms of finding the hypothesized interactive relationships. Although one statistically significant two-way interaction of IC \times job control was found, it contradicted the JDC model's theory. Also, none of the three-way interactions were significant.

Researchers (e.g., Aiken & West, 1991; Finney, Mitchell, Cronkite, & Moos, 1984) typically recommend retaining the nonsignificant interaction terms in the model for which there are strong theoretical grounds. Accordingly, the job demand \times job control

interaction term representing the main predication of the JDC model's theory was included in all of the regression analyses. However, the regression equations also included additional two, two-way interaction terms (job demand \times moderator and job control \times moderator), which were not based on the JDC theory, but were recommended to be tested in order to uncover potential interactive effects, which could be investigated in future inquiries (Aiken & West, 1991; Cohen & Cohen, 1983).

Considering the null findings for the two-way interactions in both the linear and nonlinear models as well as inclusion of two, two-way interactions which did not derive from the JDC theory, exploratory analyses were conducted with the exclusive focus on testing for the three-way, job demand \times job control \times LOC interaction effects. The regression equation was revised in such a way that none of the two-way interaction terms were included. I performed separate hierarchical regression analyses for each job demand (IC, RC, POPS). I entered the variables into the regression equation in the following four steps: age, sex, and hours worked (Step 1), job demand and job control (Step 2), moderator of LOC (Step 3), and three-way interaction term, job demand \times job control \times moderator of LOC (Step 4). The results from the analyses are presented in Table 7.

Exploratory Analyses Results

As seen in Table 7, the analyses for the three job demands did not generate any significant three-way, job demand \times job control \times LOC interactions. Therefore, the prediction that LOC would moderate the job demand/job control and burnout relationship as specified in hypotheses 2₁₋₃ was not confirmed. In terms of control effects, and as found in previous analyses (the linear and nonlinear model), age emerged as the only

significant and negative predictor in the RC model ($B = -0.814, p < .05$), and explained 5.9% of the variance in burnout. The main contribution of each job demand remained significant across all job demand models and was the largest for the POPS variable, which together with job control explained 24.3% of the variance in burnout scores. The main effect of job control was nonsignificant in all of the models. Finally, the independent contribution of LOC was found to be significant only in the RC model ($B = 0.387, p < .05$), adding 2.0% to the variance in burnout. In sum, the models for each job demand were all statistically significant, with the POPS model accounting for the greatest variability in burnout scores ($R^2 = 0.310, F(7, 196) = 12.568, p < .05$).

Table 7

Exploratory Hierarchical Regression Analyses of Job Demands (Interpersonal Conflict, Role Conflict, and Organizational Politics), Job Control, and Locus of Control on Burnout (n = 204)

Predictor	Job demands					
	Interpersonal conflict (IC)		Role conflict (RC)		Organizational politics (POPS)	
	B	R^2_{Change}	B	R^2_{Change}	B	R^2_{Change}
1 Age	-0.492	0.059*	-0.814*	0.059*	-0.631	0.059*
Sex	1.051		1.312		0.462	
Hours Worked	-0.133		-0.132		-0.134	
2 Job Demand	0.450*	0.121*	0.463*	0.162*	0.224*	0.243*
Job Control	-0.021		-0.050		0.019	
3 LOC (Moderator)	0.334	0.025*	0.387*	0.022*	0.182	0.006
4 Job Demand x Job Control x Moderator	-0.494	0.004	-0.225	0.001	-0.206	0.001
Multiple R	0.457		0.495		0.557	
R^2	0.209		0.245		0.310	
F	7.392*		9.089*		12.568*	

Note. * $p < .05$. The B values represent coefficients from the last stage of the regression analysis.

Regression Analyses: Moderator of Mindfulness ($N = 300$)

RQ1 and RQ3

RQ1 asked whether the relationship between demands of hindrance nature (IC, RC, and POPS) and burnout would be moderated by job control. RQ3 asked whether the relationship between demands of hindrance nature (IC, RC, and POPS) and job control combinations and burnout would be moderated by mindfulness.

Job Demand of Interpersonal Conflict

For the IC job demand, the corresponding hypothesis 1₁ predicted a primary moderating influence of job control on the IC-burnout relationship, which would be statistically represented in a significant two-way, IC \times job control interaction term. High job control was expected to synergistically combine with high IC, such that higher levels of job control would weaken the relationship between IC and burnout. The corresponding hypothesis 3₁ predicted a secondary moderating influence of mindfulness on the IC/job control-burnout relationship, which would be statistically represented in a significant three-way, IC \times job control \times mindfulness interaction term. High job control was expected to synergistically combine with high IC and high mindfulness, such that higher levels of job control and mindfulness would weaken the relationship between IC and burnout. The results from hierarchical regression analyses performed for the IC job demand, job control, and mindfulness on burnout are presented in Table 8.

Interpersonal Conflict Results

The first part of the analyses tested for control and main effects of the IC job demand and job control. Age entered into the first step of the equation was not a

significant predictor ($B = -0.055, p = .870$). Sex was a statistically significant and positive predictor ($B = 1.511, p < .05$), with female respondents tending to have higher burnout scores. Hours worked was not a statistically significant predictor ($B = -0.014, p = .955$). Jointly, the control variables accounted for 4.1% of the variance in burnout scores. At step two, the job demand of IC was a statistically significant and positive predictor ($B = 0.408, p < .05$), indicating that high interpersonal conflict predicted high burnout scores. However, job control was not a statistically significant predictor of burnout ($B = -0.055, p = .0221$). The two variables added 9.5% to the variance in burnout.

The second part of the analysis focused on testing the primary moderating role of job control and the secondary moderating role of mindfulness. The $IC \times$ job control interaction term entered into the third step of the equation was not statistically significant ($B = -0.262, p = .0581$). This finding fails to support hypothesis 1₁, which predicted that job control would moderate the IC and burnout relationship. The moderating role of mindfulness was tested next by entering the mindfulness score in step four, followed by the two-way interaction terms of $IC \times$ mindfulness and job control \times mindfulness (Step 5) and three-way interaction term of $IC \times$ job control \times mindfulness (Step 6). The main effect of mindfulness was statistically significant and negative ($B = -1.580, p < .05$), indicating that higher mindfulness scores predicted lower burnout scores. Also, one out of the two-way interactions, $IC \times$ mindfulness was significant ($B = 1.515, p < .05$), which along with mindfulness explained an additional 10.3% of the variance in burnout. However, the three-way interaction term, $IC \times$ job control \times mindfulness was not

significant ($B = -0.337, p = .0228$). This result, therefore, fails to support hypothesis 3₁, which proposed that mindfulness would moderate the IC/job control and burnout relationship. Overall, the model was able to explain 26.5% of variability in burnout scores ($R^2 = 0.265, F(10, 289) = 10.416, p < .05$). The results showed that the IC model was statistically significant.

Table 8

Hierarchical Multiple Regression Analyses of Job Demands (Interpersonal Conflict, Role Conflict and Organizational Politics), Job Control, and Mindfulness on Burnout (N = 300)

Predictor	Job demands					
	Interpersonal conflict (IC)		Role conflict (RC)		Organizational politics (POPS)	
	B	R ² Change	B	R ² Change	B	R ² Change
1 Age	-0.055	0.041*	-0.249	0.041*	-0.288	0.041*
Sex	1.511*		1.673*		1.074**	
Hours Worked	-0.014		0.019		-0.115	
2 Job Demand	0.408*	0.095*	0.368*	0.144*	0.195*	0.249*
Job Control	-0.055		-0.028		-0.023	
3 Job Demand x Job Control	-0.262	0.022*	-0.829*	0.002	-0.253	0.002
4 Mindfulness (Moderator)	-1.580*	0.064*	-1.485*	0.052*	-1.306*	0.027*
5 Job Demand x Moderator	1.515*	0.039*	1.355*	0.055*	1.678*	0.056*
Job Control x Moderator	-0.156		-0.675**		-0.048	
6 Job Demand x Job Control x Moderator	-0.337	0.004	-0.057	0.000	-0.456	0.005
Multiple R	.515		.542		.616	
R ²	0.265		0.294		0.380	
F	10.416*		12.035*		17.704*	

Note. * $p < .05$; ** $p < .10$. The B values represent coefficients from the last stage of the regression analysis.

Graphical Representation of Two-Way, Interpersonal Conflict × Mindfulness

Interaction Effect

As the above results show, the regression analysis for IC job demand resulted in one statistically significant, IC × mindfulness interaction. This interaction does not derive

from the JDC model's theory, and therefore, was not hypothesized in the current study. It was included in the regression analysis based on the recommended procedure (Aiken & West, 1991; Cohen & Cohen, 1983) mentioned before.

In order to understand the nature and form of the IC \times mindfulness interaction, I evaluated the effect graphically by using the simple slopes method (Jaccard & Turrisi, 2003). It can be observed (see Figure 3) that mindfulness at high levels moderated the IC and burnout relationship, but not in the expected direction. Respondents with high levels of mindfulness experienced an increase in burnout due to high IC job demand. Thus, mindfulness failed to exert a buffering effect against high levels of IC.

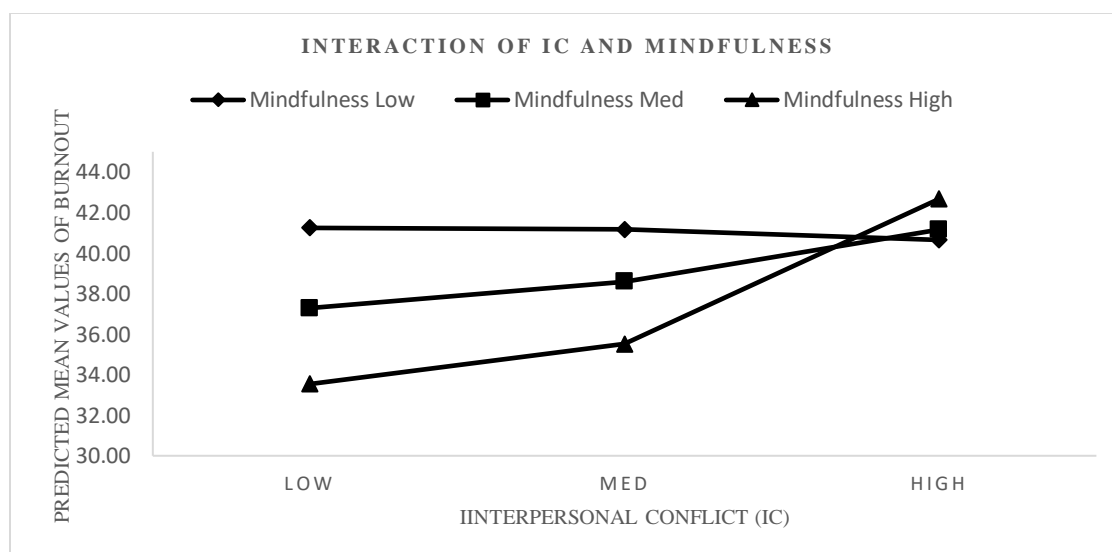


Figure 3. Two-way interaction effect of IC and mindfulness on burnout.

Job Demand of Role Conflict

For the RC job demand, the corresponding hypothesis 1₂ predicted a primary moderating influence of job control on the RC-burnout relationship, which would be statistically represented in a significant two-way, RC \times job control interaction term. High job control was expected to synergistically combine with high RC, such that higher levels

of job control would weaken the relationship between RC and burnout. The corresponding hypothesis 3₂ predicted a secondary moderating influence of mindfulness on the RC/job control-burnout relationship, which would be statistically represented in a significant three-way, RC × job control × mindfulness interaction term. High job control was expected to synergistically combine with RC and high mindfulness, such that higher levels of job control and mindfulness would weaken the relationship between RC and burnout. The results from hierarchical regression analyses performed for the RC job demand, job control, and mindfulness on burnout are presented in Table 8.

Role Conflict Results

The first part of the analysis evaluated control and main effects of the RC job demand and job control. Age entered first in the equation was not a statistically significant predictor ($B = -0.249, p = .447$). Sex was a significant and positive predictor ($B = 1.673, p < .05$), indicating that female respondents tended to have higher burnout scores. Hours worked was not a significant predictor ($B = 0.019, p = .938$). Together, the control variables accounted for 4.1% of the variance in burnout. At the second step, independent contributions (main effects) of RC and job control were evaluated. Job control was not statistically significant ($B = -0.028, p = .525$), but RC was a statistically significant and a positive predictor of burnout ($B = 0.368, p < .05$), revealing that high RC scores predicted high burnout scores. The two variables added 14.4% to the variance in burnout scores.

Part two of the analysis tested for the primary moderating role of job control and the secondary moderating role of mindfulness. At step three of the equation, the RC × job

control interaction term was statistically significant ($B = -0.829, p < .05$), and explained an additional .2% of the variance in burnout. This finding appears to be in line with the main propositions of the JDC model and hypothesis 1₂, which proposed that higher control would moderate the RC and burnout relationship. This result will be evaluated further with additional analyses.

The secondary moderating role of mindfulness was examined by entering mindfulness score (Step 4), followed by two-way interaction terms of RC \times mindfulness and job control \times mindfulness (Step 5) and three-way interaction term of RC \times job control \times mindfulness (Step 6). The results showed that mindfulness was statistically significant ($B = -1.485, p < .05$), and both, RC \times mindfulness and job control \times mindfulness interaction terms were significant ($B = 1.355, p < .05, B = -0.675, p < .10, respectively$), together explaining an additional 10.7% of the variance in burnout. However, the three-way interaction term, RC \times job control \times mindfulness was not statistically significant ($B = -0.057, p = 0.846$). This result fails to support hypothesis 3₂, which proposed mindfulness would moderate the RC/job control and burnout relationship. The RC model accounted for 29.4% of the explained variance in burnout scores ($R^2 = .294, F(10, 289) = 12.035, p < .05$). The results showed that the RC model was statistically significant.

Graphical Representation of Two-Way, Role Conflict x Job Control Interaction

To understand the nature and form of the RC \times job control interaction, I examined the effect using the simple slopes method. This analysis was necessary to determine if the interaction supports the JDC model's buffer hypothesis, as outlined in hypothesis 1₂.

Figure 4 illustrates that the interaction occurred between low and medium levels of job control and between low and medium levels of RC, resulting in decrease in burnout scores. Thus, while increasing levels of job control appear to weaken the RC and burnout relationship, the buffering effect does not seem to occur at higher levels of both job control and RC.

To evaluate this result further, I performed a post hoc probing of the RC x job control interaction, which involved tests of significance of simple slopes (Cohen, et al., 2015). The results showed that for the relationship between high job control and high RC, the slope was not statistically significant (simple slope = .250, $p = .771$). For the relationship between high job control and medium RC, the slope was not statistically significant (simple slope = $-.988$, $p = .144$). Similarly, for the relationship between medium job control and medium RC, the slope was not significant (simple slope = $.714$, $p = .285$). For the relationship between low job control and low RC, the simple slope was significant (simple slope = -2.017 , $p < .05$). Finally, for the relationship between low job control and high RC, the slope was statistically significant (simple slope = 3.896 , $p < .05$), indicating an increase in burnout.

These findings clearly show that the buffering effect is only significantly related to the outcome for combined low job control and low RC and not combined high job control and high RC, which is contrary to the predictions made by the JDC model's theory, as specified in hypothesis 1₂. Also, the combination of low job control and high RC leading to an increase in burnout is consistent with the JDC model's strain

hypothesis, which was not the focus of this study, but which predicts that jobs low in control and high in demands result in strain (i.e., burnout).

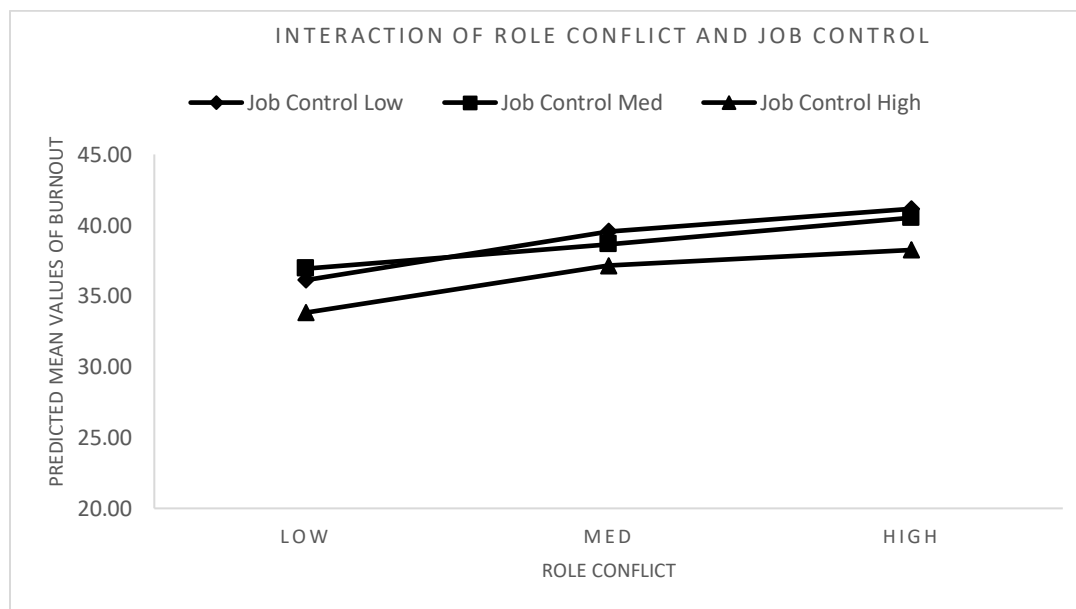


Figure 4. Two-way interaction effect of RC and job control on burnout.

Graphical Representation of Two-Way, Role Conflict x Mindfulness and Two-Way, Job Control x Mindfulness Interactions

The two statistically significant interactions found in the RC model, RC x mindfulness and job control x mindfulness do not derive from the JDC theory, and therefore, were not hypothesized in this study. To understand the nature and form of these interactions, I evaluated the effects graphically using the simple slopes procedure. Figure 5 depicts the RC x mindfulness interaction, showing that the interaction occurred at low and medium levels of mindfulness and high levels of RC, leading to an increase in burnout scores. Therefore, mindfulness failed to exert a buffering effect against high levels of RC.

Figure 6 illustrates the job control x mindfulness interaction, showing that the interaction occurred at low and medium levels of mindfulness and low levels of job control, leading to a decrease in burnout scores. Therefore, mindfulness exerted a buffering effect against low levels of job control.

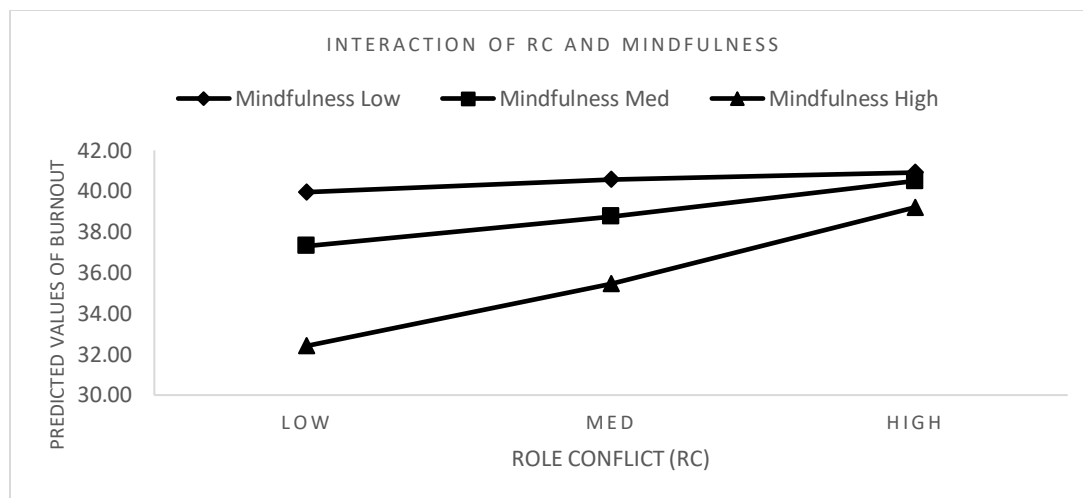


Figure 5. Two-way interaction effect of RC and mindfulness on burnout.

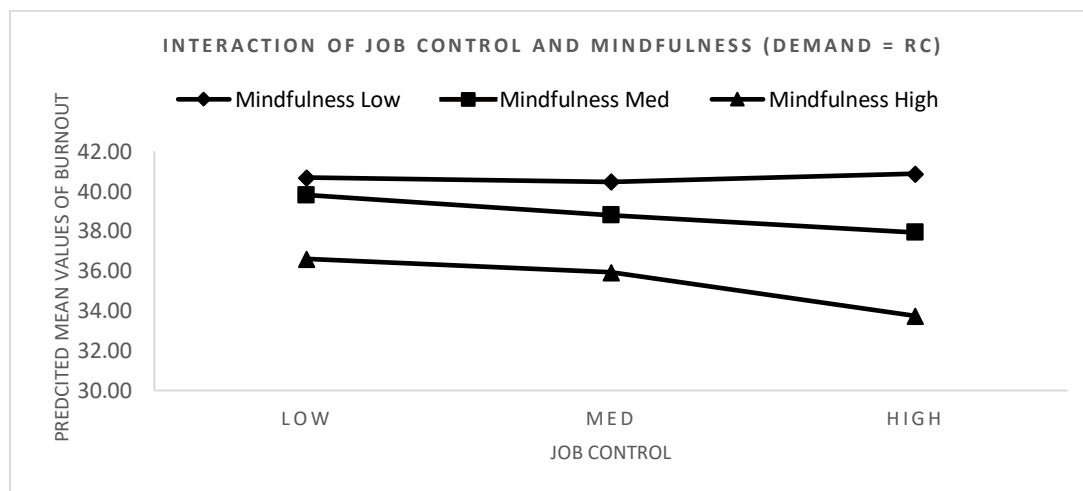


Figure 6. Two-way interaction effect of job control and mindfulness on burnout.

Job Demand of Perception of Organizational Politics

For the POPS job demand, the corresponding hypothesis 1₃ predicted a primary moderating influence of job control on the POPS-burnout relationship, which would be

statistically represented in a significant two-way, POPS \times job control interaction term. High job control was expected to synergistically combine with high POPS, such that higher levels of job control would weaken the relationship between POPS and burnout. The corresponding hypothesis 3₃ predicted a secondary moderating influence of mindfulness on the POPS/job control-burnout relationship, which would be statistically represented in a significant three-way, POPS \times job control \times mindfulness interaction term. High job control was expected to synergistically combine with POPS and high mindfulness, such that higher levels of job control and mindfulness would weaken the relationship between POPS and burnout. The results from hierarchical regression analysis performed for the POPS job demand, job control, and mindfulness on burnout are presented in Table 8.

Perception of Organizational Politics Results

As in the analyses for the other job demands, the first part examined the control and main effects of POPS job demand and job control. Age entered first into the equation was not a statistically significant predictor ($B = -0.288, p = .350$). Sex was a statistically significant and positive predictor ($B = 1.074, p < .10$), with female subjects being more likely to have higher burnout scores. Hours worked was not a statistically significant predictor ($B = -115, p = .619$). At step two, the job demand of POPS was a statistically significant and positive predictor ($B = 0.195, p < .05$), indicating that high POPS scores predicted high burnout scores. However, job control was not a statistically significant predictor of burnout ($B = -0.023, p = .595$). POPS

and job control accounted for 24.9% of the variance in burnout scores, over and above the effects of control variables.

Subsequent analyses evaluated the primary moderating role of job control and the secondary moderating role of mindfulness. At step three, the interaction term of POPS \times job control was not statistically significant ($B = -0.253, p = 0.462$). This finding, therefore, fails to support hypothesis 1₃, which predicted that job control would moderate the POPS and burnout relationship. The role of mindfulness as the moderator was tested next by entering the mindfulness score in step four, followed by two-way interaction terms of POPS \times mindfulness and job control \times mindfulness (Step 5) and three-way interaction term of POPS \times job control \times mindfulness (Step 6). The findings revealed that mindfulness was statistically significant ($B = -1.306, p < .05$), and while the job control \times mindfulness interaction term was not significant ($B = -0.048, p = .908$), the POPS \times mindfulness interaction term was significant ($B = 1.678, p < .05$), explaining an additional 5.6 % of the variance in burnout. However, the three-way interaction term, POPS \times job control \times mindfulness was not statistically significant ($B = -0.456, p = .132$). This result, therefore, fails to support hypothesis 3₃, which proposed that mindfulness would exert a moderating influence on the POPS/job control and burnout relationship. Overall, the POPS model accounted for 38% of explained variance in burnout scores ($R^2 = .380, F(10, 289) = 17.704, p < .05$). The model was statistically significant.

Graphical Representation of Two-Way, Perception of Organizational Politics x Mindfulness Interaction

The POPS x mindfulness interaction was found to be statistically significant in the POPS model. Due to the fact that this interaction is not based on the JDC model's theory, it was not hypothesized in this study. To understand the nature and form of this interaction, I plotted this effect, which is depicted in Figure 7. As shown, the interaction occurred at high levels of mindfulness and high levels of POPS, leading to an increase in burnout scores. Thus, high mindfulness failed to exert a buffering effect against high levels of POPS.

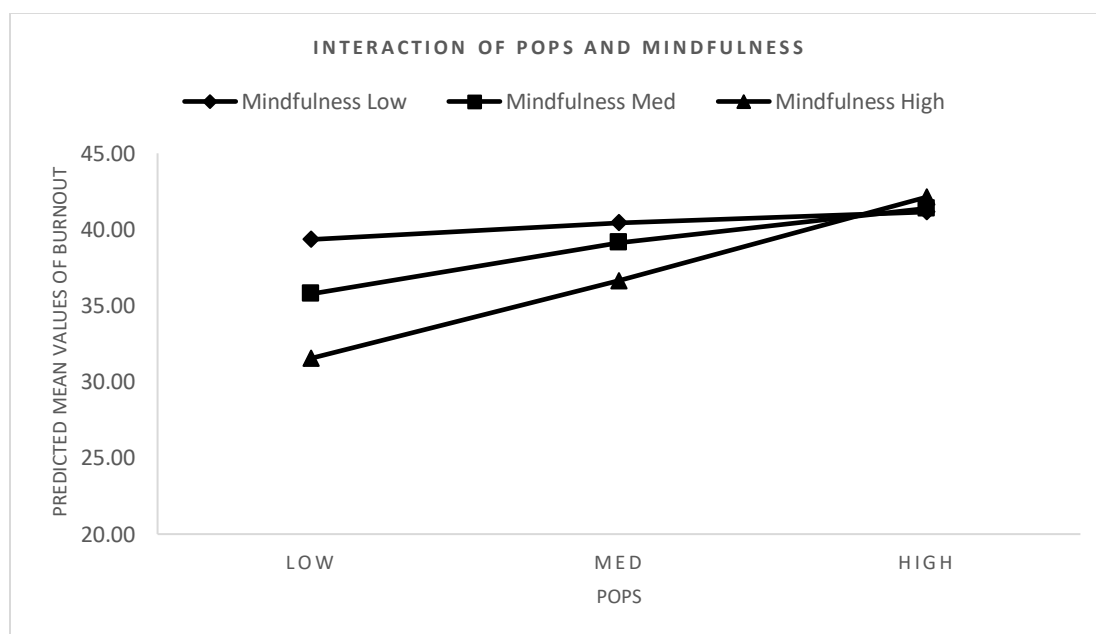


Figure 7. Two-way interaction effect of POPS and mindfulness on burnout.

Exploratory Regression Analyses: Mindfulness ($N = 300$)

The above regression results revealed only one significant two-way, RC \times job control interaction, but additional probing analysis generated results that failed to support the hypothesized moderator effects. Some of the other two-way interactions tested on

exploratory basis (job demand \times mindfulness and job control \times mindfulness) emerged as significant, with one, the job control \times mindfulness interaction in the RC model being in the expected direction (i.e., a reduction in burnout was observed). Furthermore, none of the three-way interactions were significant.

Considering the abundance of null results and as done for the moderator of LOC, exploratory hierarchical regression analyses were performed with the main focus on testing the hypothesized three-way, job demand \times job control \times mindfulness interactions (hypotheses 3₁₋₃). The regression equation was modified by removing all two-way interaction terms. I conducted separate hierarchical regression analyses for each job demand (IC, RC, and POPS). I entered the variables into the regression equation in the following order: age, sex, and hours worked (Step 1), job demand and job control (Step 2), moderator of mindfulness (Step 3), and three-way interaction term, job demand \times job control \times moderator of mindfulness (Step 4). The results from the analyses are presented in Table 9.

Exploratory Analyses Results

As seen in Table 9, the results from the four-step regression analyses show some improvement in terms of moderation effects. A significant three-way interaction term was detected in both the IC and POPS models. The IC \times job control \times mindfulness was statistically significant ($B = -0.602, p < .05$) and accounted for 2.1% of the variance in burnout scores. The POPS \times job control \times mindfulness interaction was also statistically significant, but at 90% significance level ($B = -0.554, p < .10$) and explained .9% of the variance in the outcome. These findings appear to support hypothesis 3₁ and 3₃, which

predicted a secondary moderating influence of mindfulness on the IC/job control-burnout and POPS/job control-burnout relationship, respectively. Additional probing analyses will be needed to evaluate the results further.

As far as the control effects are concerned, the results are quite similar to those of the 6-step model in that sex was the only variable that emerged as significant for all of the job demands and contributed same amount of variance to the burnout scores, which was 4.1% for each job demand. However, the effect of sex in the POPS model was detected at 95% significance level compared to 90% in the original analysis. The main contribution of each job demand remained significant across all job demand models and was the largest for the POPS variable, which along with job control (Step 2) explained 24.9% of the variance in burnout scores. As in previous analyses, the main effect of job control was nonsignificant and had a negative coefficient in both IC and RC models, but not the POPS model. Finally, the variable of mindfulness remained a significant and negative predictor in all of models, accounting for similar variances in burnout scores. In sum, each job demand model was statistically significant, with the POPS model accounting for the greatest variability in burnout scores ($R^2 = 0.324, F(7, 292) = 20.012, p < .05$).

Table 9

Exploratory Hierarchical Multiple Regression Analyses of Job Demands (Interpersonal Conflict, Role Conflict, and Organizational Politics), Job Control, and Mindfulness on Burnout (N = 300)

Predictor	Interpersonal conflict (IC)		Job demands Role conflict (RC)		Organizational politics (POPS)	
	B	R ² Change	B	R ² Change	B	R ² Change
1 Age	-0.198	0.041*	-0.292	0.041*	-0.414	0.041*
Sex	1.750*		1.857*		1.350*	
Hours Worked	-0.001		0.002		0.002	
2 Job Demand	0.274*	0.095*	0.386*	0.144*	0.222*	0.249*
Job Control	-0.062		-0.044		0.004	
3 Mindfulness (Moderator)	-1.824*	0.064*	-1.592*	0.053*	-1.272*	0.026*
4 Job Demand x Job Control x Moderator	-0.602*	0.021*	-0.392	0.005	-0.554**	0.009**
Multiple R	0.47		0.493		0.569	
R ²	0.221*		0.243		0.324*	
F	11.824*		13.361*		20.012	

Note. * $p < .05$; ** $p < .10$. The *B* values represent coefficients from the last stage of the regression analysis.

Graphical Representation of Three-Way, Interpersonal Conflict × Job Control × Mindfulness Interaction

In order to understand the nature and form of the IC × job control × mindfulness interaction, the effect was plotted, and the results are presented at low, medium, and high levels of mindfulness separately (see Figures 8-10). As illustrated, the interactions occurred at varying levels of mindfulness, but not at high levels of all three variables, as predicted by hypothesis 3₁. To confirm this finding, I conducted tests of significance of simple slopes. The results showed that for the relationship between high IC, high job control, and high mindfulness, the slope was not statistically significant (simple slope = 1.990, $p = .766$), leading to an increase in burnout. Thus, higher levels of job control

and mindfulness did not weaken the relationship between high interpersonal conflict and burnout, a finding that refutes hypothesis 3₁.

Further testing performed at medium and low levels of each variable produced similar results. For example, for the relationship between medium IC, medium job control, and medium mindfulness, the slope was not significant (simple slope = $-0.141, p = .861$). For the relationship between low IC, low job control, and low mindfulness, the slope was statistically significant (simple slope = $3.625, p < .05$), however, this interaction increased burnout. For the relationship between medium IC, high job control, and high mindfulness, the slope was significant (simple slope = $-3.863, p < .05$), leading to a decrease in burnout scores. Therefore, high levels of both job control and mindfulness buffered against moderate levels of IC. Finally, for the relationship between high IC, low job control, and low mindfulness, the slope was significant (simple slope = $4.284, p < .05$), indicating an increase in burnout. This finding is in line with the JDC model's strain hypothesis, that predicts detrimental effects of high job demands on health in the presence of concurrent low resources (i.e., job control and mindfulness).

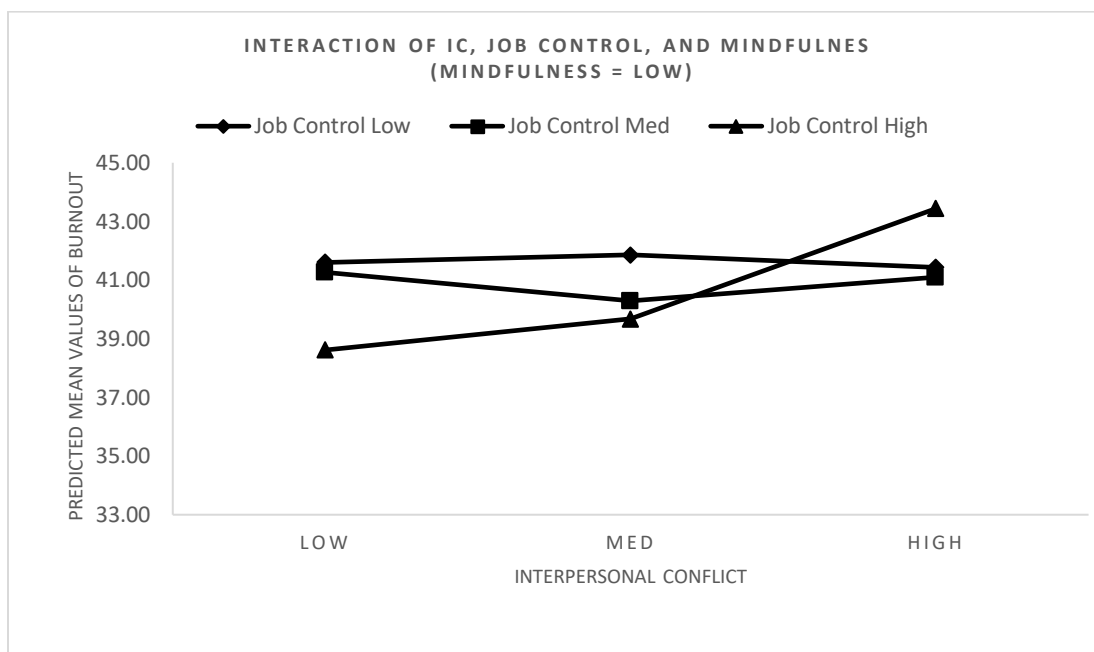


Figure 8. Three-way interaction effect of IC, job control, and mindfulness on burnout: Mindfulness at low level.

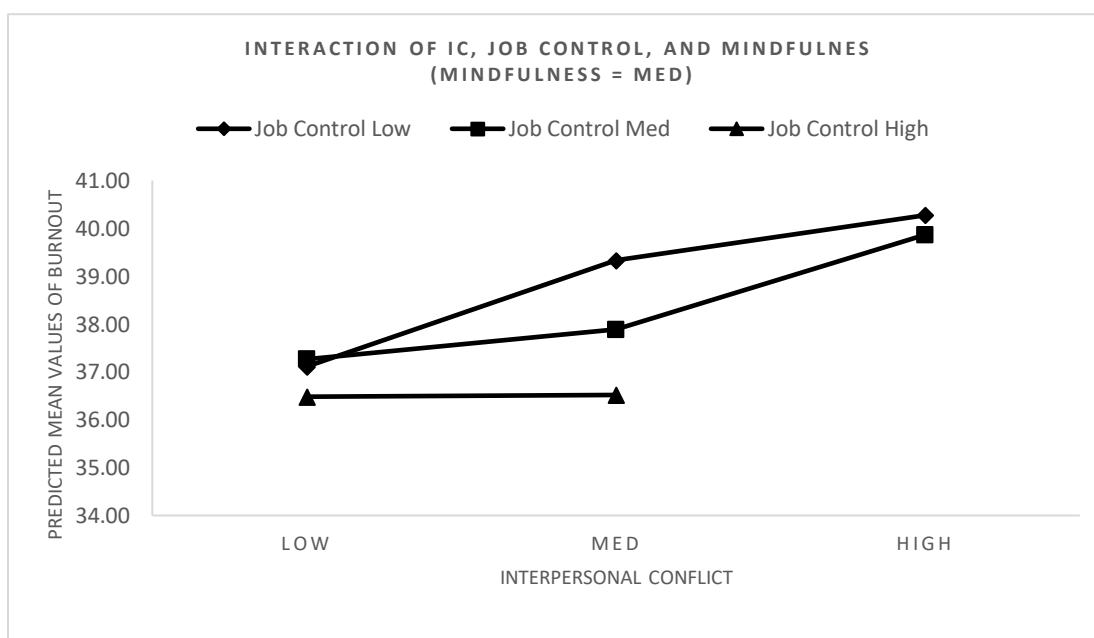


Figure 9. Three-way interaction effect of IC, job control, and mindfulness on burnout: Mindfulness at medium level.

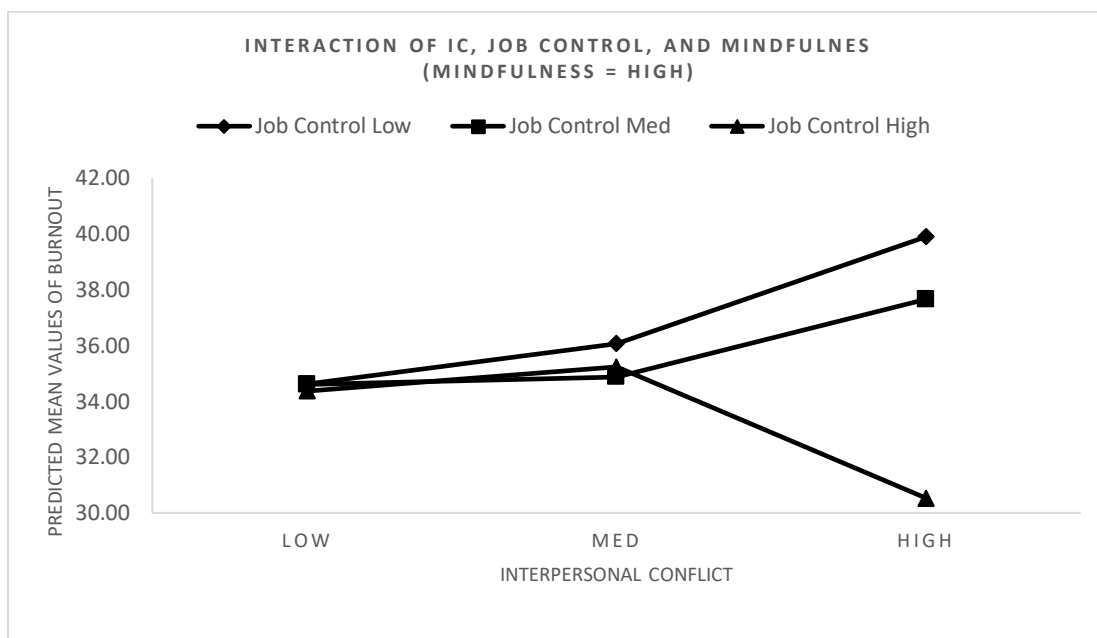


Figure 10. Three-way interaction effect of IC, job control, and mindfulness on burnout: Mindfulness at high level.

Graphical Representation of Three-Way, Perception of Organizational Politics × Job Control × Mindfulness Interaction

To elucidate the nature and form of the POPS × job control × mindfulness interaction, I plotted the effect and the results are presented at low, medium, and high levels of mindfulness separately (see Figures 11-13). As the graphs show, the interactions occurred at low, medium, and high levels of mindfulness. To evaluate whether the interaction occurred at high levels of all three variables, as specified in hypothesis 3₃, I performed tests of significance of simple slopes. The results indicated that for the relationship between high POPS, high job control, and high mindfulness, the slope was not statistically significant (simple slope = 0.696, $p = .685$). Therefore, higher levels of job control and mindfulness did not weaken the relationship between high POPS and burnout, a result that refutes hypothesis 3₃.

Additional tests conducted at medium and low levels of each variable, however, produced some significant results. For example, for the relationship between medium POPS, high job control, and high mindfulness, the slope was statistically significant and negative (simple slope = $-2.228, p < .05$), indicating a decrease in burnout scores. Thus, a combination of both high job control and mindfulness buffered against moderate levels of POPS. As expected, the buffering effect on the outcome was stronger when POPS was low, as found for the relationship between low POPS, high job control, and high mindfulness (simple slope = $-5.584, p < .05$). Finally, for the relationship between high POPS, low job control, and low mindfulness, the slope was significant (simple slope = $4.872, p < .05$), indicating an increase in burnout. This result supports the JDC model's strain hypothesis, which posits that high job demands negatively affect health in the presence of concurrent low resources (i.e., job control and mindfulness).

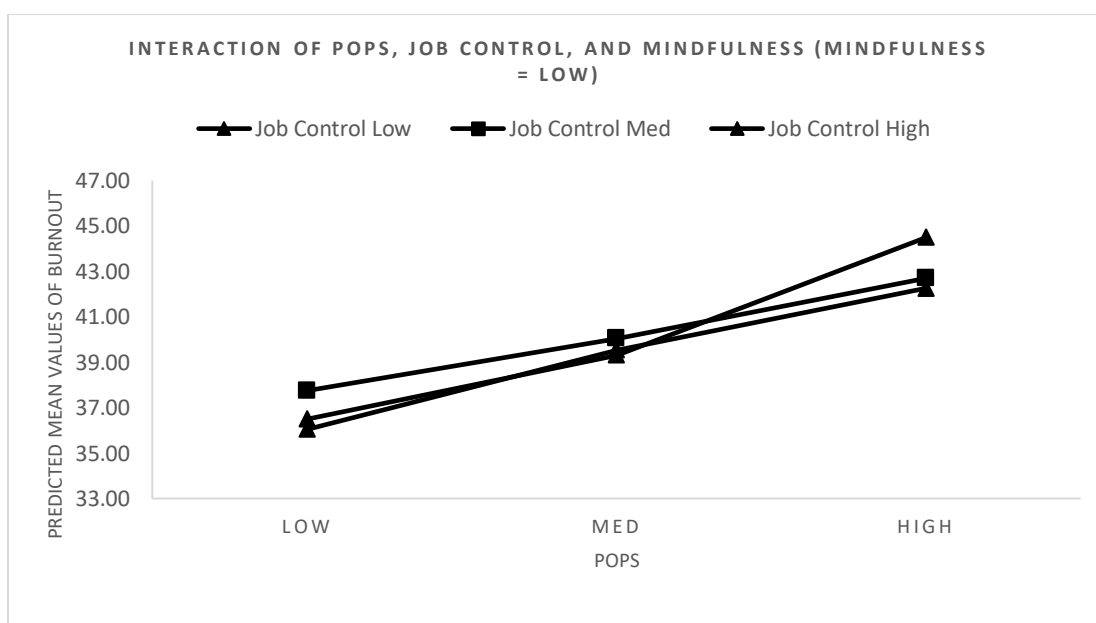


Figure 11. Three-way interaction effect of POPS, job control, and mindfulness on burnout: Mindfulness at low level.

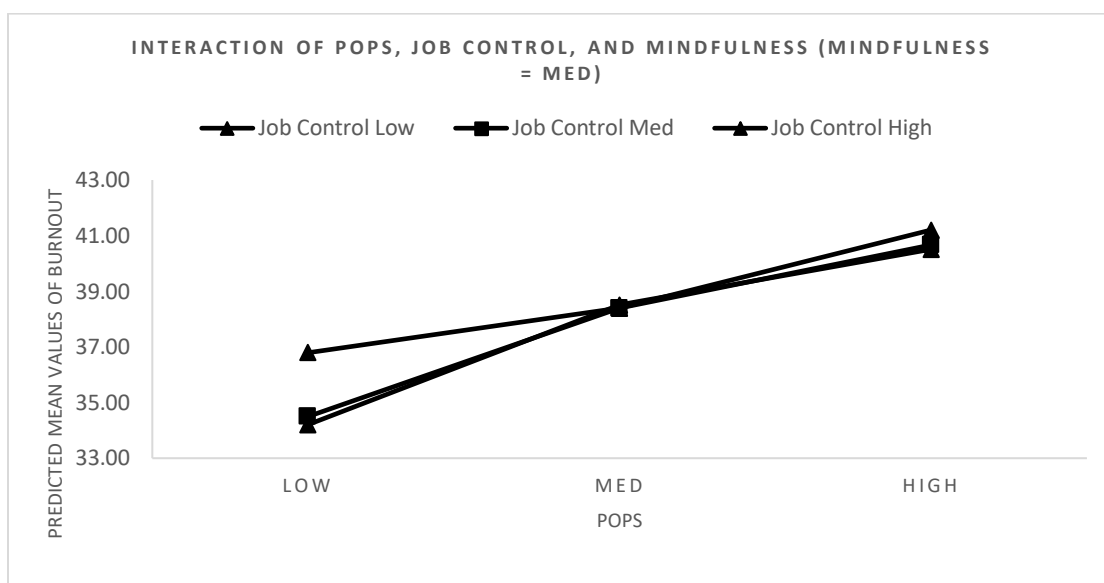


Figure 12. Three-way interaction effect of POPS, job control, and mindfulness on burnout: Mindfulness at medium level.

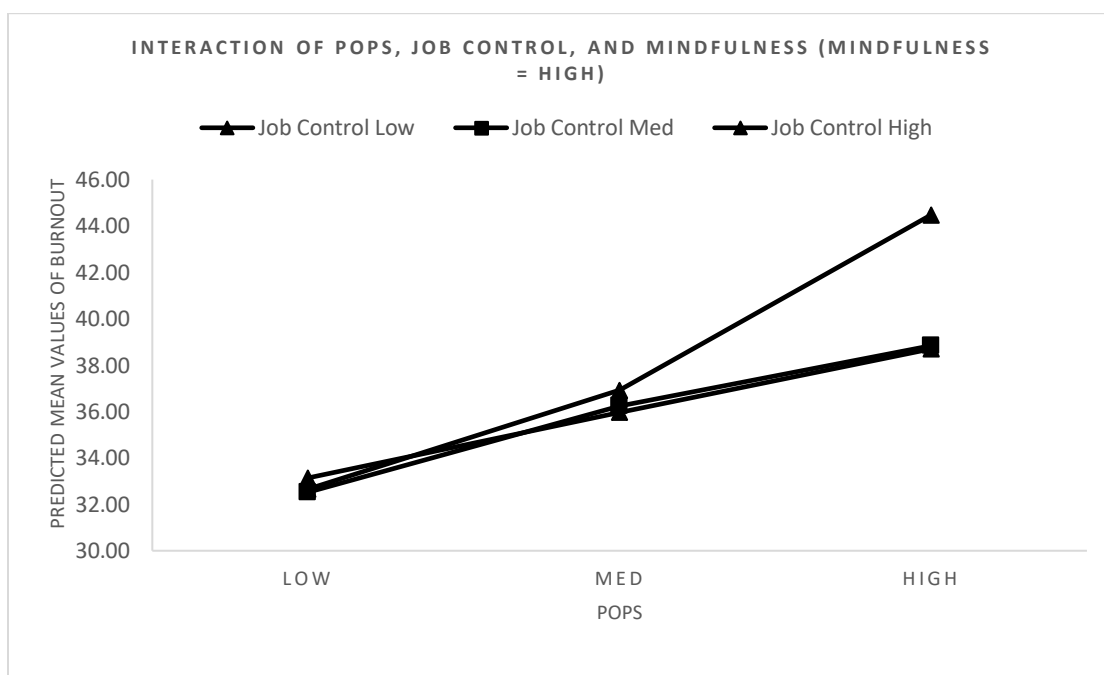


Figure 13. Three-way interaction effect of POPS, job control, and mindfulness on burnout: Mindfulness at high level.

Summary

Several hierarchical regression analyses were conducted to test the JDC model's buffer hypothesis, which was revised to include three types of hindrance job demands (IC, RC, and POPS) and two secondary moderators of LOC and mindfulness. The primary moderating influence of job control and the secondary moderating influence of LOC and mindfulness on the JDC model's dimensions in prediction of burnout was evaluated. The results from the main analyses, tests for nonlinear effects (LOC variable), and exploratory analyses for moderators of LOC and mindfulness failed to support the hypothesized moderating effects. A number of statistically significant interaction terms were detected, but some were not in the expected direction (i.e., an increase in burnout was observed), while others failed to be significantly and negatively related to burnout after additional probing analyses. All in all, the results indicated that high job control alone and in conjunction with high LOC or mindfulness did not weaken the hindrance demands – burnout relationship. The JDC model's buffer hypothesis was only partially supported with results from the nonlinear LOC analyses demonstrating that high job control attenuated moderate levels of the IC job demand. Similarly, partial support for the buffer premise was found in the exploratory analyses for the moderator of mindfulness showing that a combination of high job control and high mindfulness buffered against moderate levels of POPS and IC job demands. With regards to two-way exploratory interactions tested, only one, the job control and mindfulness interaction was significant and negative in the RC model, revealing that mindfulness attenuated the effects of low job control on burnout.

Although not hypothesized in this study, support for the JDC model's strain hypothesis was evident with some interactions such as those with combinations of high IC and low job control (nonlinear LOC analyses) and high RC and low job control (mindfulness analyses) leading to greater burnout. The strain effect was also evident in results showing combinations of high IC or POPS, low job control, and low mindfulness resulting in greater burnout scores (exploratory analyses for the moderator of mindfulness). Additional and partial support for the strain hypothesis was also observed with each job demand consistently being a significant and positive predictor of burnout in all models tested, indicating that higher job demands were associated with higher burnout. All job demands (along with job control) accounted for substantial amount of variance in every model, and especially the POPS models in which their contribution was consistently the largest.

The results for the main effect of job control, however, revealed this variable to be nonsignificant and negative predictor of burnout in all IC and RC models tested, including the POPS model in the moderator of mindfulness analysis. However, it was nonsignificant and positive predictor in all POPS models in the analyses for the moderator of LOC and exploratory mindfulness. For the main effects of moderators LOC and mindfulness, the results differed considerably. LOC emerged as nonsignificant and positive predictor of burnout in all models, but its curvilinear relationship with the outcome seemed to be present in the RC model only. Mindfulness; on the other hand, was found to be a significant and negative predictor of burnout in all job demand models, indicating the higher mindfulness was associated with reduced burnout.

As far as the control effects are concerned, results indicated that only age and sex were found to be significant predictors. Age was a significant and negative predictor of burnout in all RC models and the POPS model in the moderator of LOC, nonlinear analysis, indicating that older age was associated with lower burnout scores. Sex emerged as a significant and positive predictor of burnout in all models tested in the moderator of mindfulness analyses, revealing that being female was associated with higher burnout scores.

In Chapter 5, the results are interpreted in light of the JDC theory as well as other stress theories and relevant research findings. Study limitations are identified and recommendations for future inquires testing the JDC model's buffer hypothesis are proposed. The discussion concludes with theoretical, practical, and social change implications of the findings.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

In this quantitative survey study, I tested Karasek's JDC model's seminal buffer hypothesis, which posits that a limited set of structural factors—namely, job control and job demands—synergistically combine to attenuate the negative effects of job demands on health. Based on the scarce and inconsistent empirical evidence for the proposed buffering effects and being informed by other stress and personality theories and research, including a novel taxonomy of job demands, I modified and tested the JDC model with hindrance job demands (interpersonal conflict, role conflict, and organizational politics) and two dispositional variables of LOC and mindfulness in prediction of burnout. Focusing on job demands as hindering in nature was suggested to mark a boundary condition for the proposed stressor-strain relations in the JDC model. I expected the inclusion of person factors as secondary moderators of the JDC model's dimensions to enhance the moderating power of job control against health damaging high job demands. The revisions seemed necessary to elucidate the path from occupational stress to health, as predicted by the buffer premise. The findings were anticipated to not only contribute to the existing knowledge base, but more importantly, assist organizations in job design efforts aimed at preventing occupational burnout. While the results failed to fully validate the hypothesized moderating effects, some supportive evidence for the JDC model was obtained. The findings are interpreted in the background of the JDC model, personality theory, and other occupational stress theories and relevant research.

Revisions and Summary of Findings

As indicated by the extant research findings on the JDC Model, high job control, although typically associated with salutary outcomes (i.e., greater well-being), has not been consistently shown to moderate the effects of high job demands on employee adjustment (de Lange et al., 2003; Hausser et al., 2010; van der Doef & Maes, 1999). Therefore, to increase chances of detecting the postulated buffering effects of job control on the job demand-burnout relationship, I revised the JDC model and included hindrance job demands (interpersonal conflict, role conflict, and organizational politics) as well as two personality variables of LOC and mindfulness serving the function of secondary moderators. These revisions were based on limitations of the JDC model and inadequate conceptualization of the job demand construct and failure to account for person factors (e.g., dispositions). The revisions were also substantiated by several theoretical perspectives and pertinent research.

The challenge-hindrance stress model (Cavanaugh et al., 2000), with its emphasis on dual dimensionality of stressors, helped recognize the need to focus on hindrance rather than challenge type of job demands typically examined in the JDC research. The differential reactivity of personality theory (Bolger & Zuckerman, 1995), which recognizes the modulating influence of personality in stress responses and adaptation supported the inclusion of LOC and dispositional mindfulness as conjunctive moderators in the exclusively environmentally based JDC model. Tenets of the transactional stress framework (Lazarus & Folkman, 1984) and its emphasis on the person-environment relationship and the influential process of cognitive appraisal of stressors served as a

theme unifying the selected theories, further strengthening the argument for the modifications to the original JDC model.

The moderation analysis was conducted on occupationally diverse sample using a hierarchical multiple regression. Due to insufficient number of respondents with external LOC required for the selected statistical tests, the analysis focused on the internal LOC ($n = 204$), while the entire sample ($N = 300$) was used in the analysis involving mindfulness. Despite carefully considered revisions, the results from the initial analyses failed to support the hypothesized moderating effects. High job control did not exert the predicted buffering effects, including when in the presence of conjunctive moderators of LOC and mindfulness. Thus, none of the formulated hypotheses were confirmed. However, partial support for the buffering effects was obtained in the nonlinear LOC model where high job control buffered against moderate and low levels of the IC job demand and in the exploratory analyses for the moderator of mindfulness where concurrent high job control and high mindfulness buffered against moderate levels of the IC and POPS job demands.

Although not hypothesized, the data also provided supporting evidence for the JDC model's strain hypothesis, as evident by results showing combinations of low job control and high job demands (i.e., IC and RC), including low job control, low mindfulness, and high job demands (i.e., IC and POPS) leading to greater burnout. Also, partial support for the strain premise was observed with all the job demands being significantly and positively associated with burnout and mindfulness being significantly and negatively associated with burnout. The results for the moderating effects of job

control, LOC, and mindfulness are evaluated in the sections that follow. Included in the discussion are findings for control effects and the strain hypothesis. Also, study limitations and recommendations for future research are presented. The discussion concludes with theoretical, practical, and social change implications of the findings.

Interpretation of the Findings

The Primary Moderator of Job Control

Although the main goal of this study was to test a revised hindrance job demand-control model in prediction of burnout with two conjunctive moderators (LOC and mindfulness), the effect of the primary moderator of job control was also examined. The JDC theory postulates that job control is the single most important buffer against the adverse effects of job demands. Thus, I hypothesized that job demand (i.e., interpersonal conflict, role conflict, and organizational politics) and job control interaction would be related to burnout, such that higher levels of job control will weaken the association between high job demands and burnout (hypotheses 1₁₋₃).

The hypothesized moderating influence of job control, however, was not observed in the results. While significant job demand and job control interactions were detected in the nonlinear analyses for the moderator of LOC (IC model) and in the analyses for the moderator of mindfulness (RC model), additional analyses showed that high levels of job control did not weaken the relationship between high IC or RC job demands and burnout. Thus, hypotheses 1₁ and 1₂ were not supported. Despite these findings, high job control mitigated the effects of moderate levels of the IC job demand, providing partial support

for hypothesis 1₁. As expected, high job control also attenuated low levels of the IC job demand, but this result clearly contradicts the JDC model's theory.

These findings are similar to those reported in previous research testing the validity of the JDC model's buffer hypothesis with burnout (Dawson et al., 2016; Pisanti et al., 2015; Pisanti et al., 2016; Wood et al., 2011) and other forms of strain (Baba et al., 2013; Penseau et al., 2014; Tucker et al., 2008). For instance, in examining the interactive effects of the JDC model on burnout using a sample of nurses ($N = 1,479$), Pisanti et al. (2015) found no support for the buffer hypothesis. The data revealed that job control and job demand independently, rather than synergistically, predicted the outcome. In another study, Baba et al. (2013) observed that in one of the sample of nurses studied ($n = 240$), job control moderated the adverse effects of low and moderate rather than high level of job demands. Similarly, Penseau et al. (2014) who used a large sample of nurses and administrators ($N = 2,079$) found that job control moderated the demand-distress relationship by reducing the effects of low, not high demands, which is clearly not in line with the JDC model's buffer premise.

Results from this inquiry and past research (van der Doef & Maes, 1999) demonstrate that the moderating effect of job control predicted by the JDC model is difficult to detect, regardless of the population and sample size used. The inclusion of hindering job demands (interpersonal conflict, role conflict, and organizational politics) in this study rather than those of challenging nature (workload, time pressure) typically examined in the JDC research has not made a difference in the results. In contrast to recent findings (Cheung et al., 2015; Dawson et al., 2016), job control still failed to

buffer against high levels of hindrance job demands. In addition, using a fact-based measure of the job control construct, the FAS (Spector & Fox, 2003), rather than Karasek's (1979) autonomy scale, which has been suggested to be confounded with unrelated constructs (i.e., skill utilization, job variety) also made no difference in terms of detecting the postulated buffering effects.

Considering the scarcity of postulated buffering effects in the JDC literature, the significant interaction term showing job control buffering against moderate levels of the IC job demand may represent an occasional or chance type of finding. However, detection of significant moderating effects in field studies in general has also been extremely difficult, with some authors (e.g., Evans, 1985) suggesting that even those accounting for a marginal amount of total variance (e.g., 1%) should be regarded as meaningful. The significant IC job demand and job control interaction term accounted for 2.6% of the variance in burnout scores. Interestingly, it was detected in the nonlinear analysis for LOC, which contained a quadratic term of this variable. According to Ganzach, (1997), and as more recently demonstrated by Johnston et al. (2103), the relationship between variables may not always be linear, therefore, introducing quadratic terms may increase chances of detecting moderator effects, if present. Thus, it is possible that the inclusion of a quadratic term of LOC into the analysis assisted in uncovering this interaction.

Although counter to the central prediction of the JDC model, the ability of job control to buffer against moderate levels of interpersonal conflict job demand is still a noteworthy finding. Interpersonal conflict has been identified as one of the most

prevalent stressors in a work setting that is associated with deleterious consequences (Spector & Jex, 1998; Fox, Spector, & Miles, 2001). It is often characterized by conflicts with supervisors or co-workers that include various negative reactions (e.g., disagreements, rudeness, verbal or physical aggression), adversely affecting worker health and well-being. Current results, including past research (e.g., Jaramillo, Mulki, & Boles, 2011; Sliter, Pui, Sliter, & Jex, 2011) have shown interpersonal conflict to be an important correlate and predictor of burnout. Therefore, knowing that job control can provide some protection against interpersonal conflict is important to prevention of burnout.

The literature offers some plausible explanations for the observed buffering effects of job control against a stressor such as interpersonal conflict. Job control is associated with greater freedom and independence in performance of work tasks, which reduces pressures that may induce conflict (Liu, Spector, Liu, & Shi, 2011). Perceived job control also influences how work stressors are experienced (Spector, 2000). Here, the process of cognitive appraisal emphasized by the transactional stress framework (Lazarus & Folkman, 1984) is relevant as it points to the role of perception and interpretation of environmental conditions. A worker with greater autonomy may exert effort to alter the appraisal of a hindering stressor like interpersonal conflict to one that is less threatening, and thus, respond more flexibly and constructively. In fact, research has shown that job control, through appraisal-focused or problem-focused coping, mitigates the adverse effects of diverse job demands on workers' well-being (Daniels, 1999; Daniels & Harris, 2005). However, research also suggests that high levels of job demands may outweigh

coping responses associated with job control. For example, Daniels (1999) found that while high job control enhanced appraisal and problem-focused coping capacity, these efforts buffered against moderate, but not high job demands. Thus, even at high levels, job control may not provide sufficient coping resources to protect against high job demands.

The above findings as well as the results obtained on the primary moderating role of job control in this study further reinforce the arguments set forth in Chapter 2. That is, job control, although an important variable in the job stress process, may need to be accompanied by additional resources to exert the hypothesized modulatory influence on the JDC model's dimensions. In his study, the focus was on two person resources of LOC and mindfulness, which were expected to enhance the moderating influence of job control. While their inclusion failed to validate the JDC model's buffer hypothesis, the results provide some insights, helpful in understanding the moderating role of job control in the hindrance job demand-burnout relationship.

The Secondary Moderator of Locus of Control

The personality variable of LOC was examined as the secondary moderator of the hindrance job demand-control and burnout relationship. LOC, which is characterized by an enduring and generalized belief in control over outcomes (Rotter, 1966), has been long regarded as a dispositional antecedent of job control perceptions (Ganster & Fusilier, 1989). In this study, I expected the internal dimension of LOC, which is represented by greater control beliefs to strengthen the buffering effect of job control. Accordingly, I hypothesized that job demand (i.e., interpersonal conflict, role conflict, and

organizational politics), job control, and LOC will be related to burnout, such that higher levels of job control and LOC will weaken the associations between high job demands and burnout (hypotheses 2₁₋₃).

Despite LOC's theorized potential to boost the buffering effect of job control, it failed to exert the moderating influence. The results showed that none of the job demand, job control, and LOC interactions were significant. Thus, the formulated hypotheses 2₁₋₃ were not confirmed.

Unfortunately, such null findings are not an exception in the JDC literature. Research testing the buffer hypothesis of the JDC model and of its expanded version (JDCE) with LOC as the moderator is not only limited and dated, but also mixed in terms of demonstrating the postulated buffering effects (e.g. Daniels & Guppy, 1994; Meier et al., 2008; Parkes, 1991; Rodriguez et al., 2001). For instance, Meier et al. (2008) using a sample of service employees ($N = 96$) found that synergistically combined high levels of internal LOC and job control moderated the adverse impact of job demands on both affective and physical strain. In contrast, Parkes' (1991) cross-sectional and longitudinal studies with civil servants ($N = 590$) and student teachers ($N = 147$), respectively, showed no evidence for the buffering effects. Internal LOC combined additively rather than concurrently to predict mental health outcomes. To illustrate further, results from a prospective study by Rodriguez et al. (2001) who used a sample of administrators ($N = 543$) demonstrated that the interaction between internal LOC and high job control led to a reduction rather than enhancement of job satisfaction, a finding that invalidated the buffer hypothesis.

The current inquiry was not successful in reconciling the conflicting pattern of findings. Internal LOC, a person variable often documented as a resiliency factor against burnout (Dijkstra et al., 2011; Gueritault-Chalvin et al. 2000; Injeyan et al., 2011; Wilski et al., 2015) did not exert the expected moderator effects on the hindrance job demand/control and burnout relationship. This finding is incongruent with stress and personality theories that guided this research. From the transactional stress theory perspective (Lazarus & Folkman, 1984), it is the person (i.e., control beliefs) and environment (i.e., job control) relationship that through the mechanism of cognitive appraisal, affects the stress experience and coping. The differential reactivity of personality theory (Bolger & Zuckermann, 1995) delineates these relations further by designating dispositions as variables that moderate the influence of job stressors on affective outcomes. More specifically, the level of person's attribute (high vs. low) is asserted to impact the stressor-strain linkage. Thus, unlike job incumbents with external LOC (low control beliefs), those with internal LOC (high control beliefs) are expected to perceive more job control, including control over other situational contingencies (i.e., hindering job demands), and therefore, appraise them more positively, and cope more effectively. These assertions have been corroborated by research showing that workers with internal orientation exhibit greater control appraisals (e.g., Parkes, 1984; Peacock & Wong, 1996; Vitaliano, Russo, & Maiuro, 1987) and tend to engage in active coping efforts (e.g., Dijkstra et al., 2011; Khan, Saleem, & Shahid, 2012; Strivastava & Sager, 1999), which facilitates adjustment.

The results from this study, however, are clearly not in line with the above theoretical propositions and research findings. Contrary to expectations and previous research (e.g., Dijkstra et al., 2011; Sprung & Jex, 2012), internal LOC was found to have a positive relationship with all the hindrance job demands, including burnout. Also, in contrast to other reports (e.g., Meier et al., 2008; Parkes, 1991), internal LOC correlated negatively with job control. Such relations may be unique to the sample used, and likely had an impact on LOC's performance as the moderator. A further important reason for the null findings may be attributable to the measurement error of variables forming the interaction term (Frazier, Tix, & Barron, 2004). Particularly relevant and concerning to the present investigation is the low reliability of the LOC measure ($\alpha = .55$), which contributed to the reliability of the three-way product terms (i.e., job demand x job control x LOC), affecting the power to detect any significant interaction effects (Busemeyer & Jones, 1983).

The aforementioned issues help explain the null findings, with the unexpected associations of LOC with all of the key variables being perhaps the most telling. These relations point to higher LOC as a possible stressor rather than a buffer. Although the literature overwhelmingly characterizes internal LOC as a protective factor against stress and strain, some research suggests a much more diverse role of this variable. Such evidence derives from laboratory investigations indicating that control, regardless of type (i.e., dispositional or environmental), does not always attenuate stress, as in some instances, it may have a stress inducing effect (e.g., Burger, 1989; Houston, 1972; O'Donnell et al., 2015; Rodin, 1990; Solomon, Holmes, & McCaul, 1980). For example,

results from an experimental study by O'Donnell et al. (2015) revealed that increased control functioned as a potential stressor due to its association with elevated stress responses on physiological indices (e.g., heart rate variability, salivary alpha-amylase), reduced performance, and no changes to the level of perceived demands. In another earlier experimental investigation, Houston (1972) found that subjects with internal LOC exercising actual control experienced greater physiological arousal compared to their external counterparts. Similar findings demonstrating control leading to negative outcomes have been reported in literature reviews conducted by Burger (1989) and Rodin (1990).

Collectively, research findings suggest that LOC may have favorable as well as adverse impact on worker health and well-being. Such differential effects may be explained by considering the possibility of LOC having a curvilinear, or an inverted U-shaped relationship with the job features examined in this study. Drawing from Warr's (1987) vitamin model of stress, LOC just like vitamins, may be beneficial up to, but not beyond a certain level, after which its positive influence diminishes or may even be harmful. Thus, LOC at high levels could be costly in terms of health. This proposition, although not examined directly, is supported by research showing that intermediate, but not high levels of control beliefs are more adaptive in terms of coping with stress (e.g., Krause & Stryker, 1984; Krause, 1986; O'Brien, 1984). Such results extend to job control with some empirical evidence suggesting that high levels of this variable may have a reverse effect (Padyab et al., 2014; Xie, 1996).

In this study, the possibility of LOC being curvilinearly related to the key constructs, including burnout was considered. As contended by some researchers (e.g., Ganzach, 1997; Lubinski & Humphreys, 1990), a presence of a nonlinear relationship between variables may restrict detection of significant moderator effects. Thus, I employed statistical controls by including a quadratic term of LOC in subsequent analyses. However, while this approach seemed to help uncover a two-way, IC job demand and job control interaction, none of the three-way, job demand, job control, and LOC interactions were significant. The results suggested that while examining for curvilinear effects may be of some value, it may be necessary to consider alternative explanations for the observed performance of LOC.

Although the literature suggests various reasons for the null findings, it may be the lack of a match between resources (LOC, job control) and job demands (interpersonal conflict, role conflict, and organizational politics) that led to the current results. According to the matching hypothesis proposed by de Jonge and Dormann (2006), the moderator effects are most likely to occur when stressors and resources or stressors or resources and strain represent same or similar dimensions of psychological functioning (e.g., cognitive, emotional, physical) being referred to as the *double match*. Further, the effects are proposed to be the strongest when stressors, resources, and strain all match, which is referred to as *the triple-match principle (TMP)*. The authors have generated support for their predictions with results from two longitudinal surveys revealing most significant interactions being detected in cases of the TMP (33.3%), followed by a double match (16.6%), and no match (0.0%) (de Jonge & Dormann, 2006).

In the current study, LOC (control beliefs) and job control (control over breaks, scheduling, tasks, and method) representing cognitive and behavioral domains, respectively, appear to be poorly matched with job demands (interpersonal conflict, role conflict, and organizational politics) characterizing the emotional domain. Although greater general perception of control (i.e., internal LOC) and environmental control (i.e., job control) may mobilize a worker to appraise hindering job demands as less threatening, resulting in a more positive response, it may not be sufficient to manage other aspects of such demands (e.g., negative and lingering emotions). As argued by Spector (2000), work/person resources must be over specific stressors in order to be effective and simply increasing control in general will not be helpful and may even generate more stress. For example, a worker with internal LOC and job control may be less affected by a rude co-worker (a source of interpersonal conflict) due to stronger belief in control over the situation and freedom to select job tasks that do not involve the individual. However, the mere presence of the colleague may evoke negative emotions, which when not managed, may lead to more stress. In another situation, a worker with internal LOC and job control may perceive organizational politics as an opportunity for personal gain rather than a threat. Such an individual will believe that they can control the political process and likely take advantage of greater autonomy to make job decisions that would be recognized and rewarded (e.g., extra pay, promotion). Despite these efforts, however, some of the decisions may be incompatible with individual's personal values and elicit conflicting emotions, resulting in more stress.

It is possible, therefore, that the mismatch between resources (LOC, job control) and stressors (interpersonal conflict, role conflict, and organizational politics) was the reason for the null findings. While both LOC and job control affect the appraisal of stressors and affective responses (Spector, 2000), they may not be adequate to address emotions associated with the hindrance job demands considered in this study. In addition, and as discussed before, control (dispositional or environmental) at high levels, may increase stress, and thus function as stressors, placing further demands on cognitive and emotion regulative processes. Therefore, resources that match with stressors and in this case, have a more direct impact on emotions being triggered by hindrance job demands are likely needed to protect workers against burnout. Indeed, support for this contention has been provided by some, albeit limited, JDC research (Dawson et al., 2016; Konze et al., 2017; van Vegchel, de Jonge, Soderfeldt, Dormann, & Schaufeli, 2004). For example, results from a longitudinal study by Dawson et al. (2016) showed that job control combined with social support (a source of affective support) buffered against hindrance job demands (interpersonal conflict, role conflict, and organizational politics) in prediction of affective strain (i.e., anxiety). In a similar vein, Konze et al. (2017) study findings revealed that job control (e.g., control over tasks/method) moderated the effects of related quantitative job demands (e.g., workload), but not those of emotional dissonance on workers' emotional exhaustion. The need for resources to match stressors was further illustrated by van Vegchtel et al. (2004) who found that job control (e.g., control over work pace) moderated low, rather than high emotional job demands (e.g., troublesome clients) on employees' burnout.

All in all, while various factors may have affected the lack of moderator effects of the LOC variable, the matching hypothesis offers quite a compelling explanation. LOC and job control representing cognitive and behavioral domains, respectively, complement each other, but seem to be inadequately matched with hindrance job demands representing the emotional domain. The mismatch is especially pronounced when combined high levels of LOC and job control operate as stressors, further exacerbating the emotional reactions to hindrance job demands. Such a situation cancels out any prior positive impact that LOC and job control may have had on emotional states. Thus, it seems that in order to weaken the job demand-burnout relationship as posited by the JDC model, job control/LOC would need to be moderated by further emotional resources that would effectively target affective reactions elicited by hindrance job demands. In such a case, resources, stressors, and strain would be better matched in terms of addressing the emotional domain, which could increase chances of detecting interaction effects, as posited by the TMP and supported by relevant research.

The Secondary Moderator of Mindfulness

Dispositional mindfulness was another person variable evaluated as the secondary moderator of the hindrance job demand-control and burnout relationship. Mindfulness is a unique state of consciousness involving a non-judgmental awareness and nonreactive attention to internal and external stimuli. A mindful capacity promotes positive reappraisal of stressors, leading to more flexible and adaptive response (Garland et al., 2009). In this study, I expected that greater mindfulness would enhance the buffering effect of job control. Accordingly, I hypothesized that job demand (i.e., interpersonal

conflict, role conflict, and organizational politics), job control, and mindfulness will be related to burnout, such that higher levels of job control and mindfulness would weaken the associations between high job demands and burnout (hypotheses 3₁₋₃).

The predicted modulatory role of mindfulness was not demonstrated by the data. Concurrent high mindfulness and job control failed to buffer against high job demands in prediction of burnout, a result that refuted hypotheses 3₁₋₃. However, the exploratory analyses revealed that combined high mindfulness and job control exerted a buffering effect on moderate levels of the IC and POPS job demands.

Overall, the data showed that compared to the LOC variable, mindfulness was a more beneficial and influential personal resource in the JDC model. Its better performance as the predictor and moderator may be attributed to the relations it had with the other key variables, including burnout. For example, unlike the internal LOC variable, mindfulness was positively associated with job control, which is consistent with previous research findings (e.g., Grover, Teo, Pick, & Roche, 2016; Taylor & Millier, 2016). Also, mindfulness correlated negatively with all the job demands, which is in line with some of the past reports (e.g., Haun, Nubold, & Bauer, 2018; Valentine, Godkin, & Varca, 2010; Westphal et al., 2015). Finally, it had a negative association with burnout, relations that have been well documented in previous investigations (e.g., Harker, Pidgeon, Klassen, & King, 2016; Testa & Sangganjanavanich, 2015; Voci et al., 2016).

The moderator effects of mindfulness emerged in the exploratory analyses where the two terms (IC job demand x job control x mindfulness and POPS job demand x job control x mindfulness) accounted for 2.1% and .9% of variability in burnout scores,

respectively. While these significant interactions may be true due to mindfulness' positive role in the stress process, their detection may have been influenced by the implemented step-down procedure. More specifically, the exploratory analyses excluded all two-way terms (i.e., job demand x job control; job demand x mindfulness; job control x mindfulness), which increased power to detect interactions. At the same time, this method may have led to biased effects (Overall, Lee, & Hornick, 1981). While some authors (e.g., Aiken & West, 1991; Overall et al., 1981) recommend retaining nonsignificant interactions if they are expected by a theory, others (e.g. Cramer & Appelbaum, 1980) strongly defend their removal as this enhances efficiency in detecting significant results. In this case, dropping the two-way, job demand x job control term from the regression equation in particular, may seem counter to the JDC theory. However, this decision was influenced not only by the nonsignificant results, but also the abundance of null findings plaguing the JDC literature. More importantly, the theory (i.e., buffer hypothesis) was still being tested with an extended model that included the secondary moderator of mindfulness. As such, the approach was reasonable and offered a more focused test of the proposed moderator effects.

The significant three-way interactions found revealed that combined high mindfulness and high job control can offer workers some protection against burnout by attenuating the effects of moderate IC and POPS job demands. Although these findings do not fully support the JDC model's buffer hypothesis, they can be viewed as encouraging in light of current and past research on IC (e.g., Jaramillo et al., 2011; Mulki, Jaramillo, & Locander, 2008) and POPS (e.g., Dawson et al., 2016; Kar & Suar,

2014) identifying the two demands as quite potent work stressors. This study's results showed that while both IC and POPS correlated strongly with burnout, POPS had the largest correlation and its main effect was so powerful that it resembled that of burnout, a finding consistent with previous reports (e.g., Dawson et al., 2016). Considering such relations, the observed conjunctive moderator effect of mindfulness suggest that this variable represents a valuable personal resource that can, to some extent, aid employee adjustment to strain inducing IC and POPS job demands.

Although this study was the first to evaluate mindfulness in the context of the JDC model, the detected buffering effects of this attribute are broadly in line with research demonstrating its moderating influence on the stressor-strain relationship (Fisher et al., 2017; Grover et al., 2016; Haun et al., 2018; Westphal et al., 2015). For example, Westphal et al. (2015) studying a sample of emergency room nurses ($N = 50$) observed that mindfulness buffered the influence of quantitative (e.g., workload) and emotional (e.g., conflicts with colleagues/others) job demands on mental health and burnout. Similarly, Grover et al. (2016) using a sample of nurses ($N = 415$) found that mindfulness attenuated the adverse effects of emotional job demands on psychological strain. In another report, Fisher et al. (2017) who used a sample of police officers ($N = 239$) documented that mindfulness exerted a moderating effect on the relationship between job demands (e.g., workload) and mental as well as physical strain.

The observed secondary moderating influence of mindfulness on the stressor-strain linkages also supports the theories guiding this inquiry. The finding is consistent with the differential reactivity of personality theory (Bolger & Zuckerman, 1995), which

posits that dispositional variables moderate the impact of stressors on the outcomes. It is also concordant with the main tenets of the transactional stress theory (Lazarus & Folkman, 1984), which propose that both, the person (mindfulness) and the environment (job control) jointly shape appraisal of stressors (IC and POPS job demands) and ensuing cognitive-affective responses. The appraisal process is especially relevant to the mindfulness construct as it represents one of the key mechanisms underpinning its salutary effects (Garland et al., 2010; Shapiro et al., 2006). Individuals high in dispositional mindfulness have a greater capacity to engage in positive cognitive reappraisal of stressors (e.g., viewing them as benign or beneficial), which fosters more efficient management of negative emotional states (Modinos et al., 2010). Such meaning-based coping, as posited by the mindful coping model (Garland et al., 2011) and supported by neurological research (e.g., Koenigsberg et al., 2010; Lebois et al., 2015), is initiated by decentering (or disengaging) from the stressor and fixed mental content (e.g., negative thoughts, emotions, sensations), which broadens the state of mindful awareness allowing for more flexible and positive cognitive- emotional responding.

The enhanced cognitive and affective control inherent in mindfulness may help explain its protective function against emotional type of IC and POPS job demands and burnout observed in this study. Consistent with the TMP of the matching hypothesis (de Jonge & Dormann, 2006) discussed earlier, mindfulness and job control representing cognitive-emotional and behavioral domains, respectively, seem to correspond well with IC and POPS job demands and burnout characterizing the emotional domain. In this triple resource-stressor-strain match, mindfulness operates as an internal resource that provides

workers with self-regulatory cognitive control needed to manage emotions associated with IC and POPS job demands and mitigate their effect on burnout. Indeed, research has shown that trait mindfulness protects against emotional reactivity to stressful events (Brown et al., 2013) by attenuating rumination and negative cognitive bias (Paul, Stanton, Greeson, Smoski, & Wang, 2013). Thus, not surprisingly, individuals with high mindfulness tend to respond to interpersonal conflict with less anger and anxiety (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007) as well as less hostility, verbal, and physical aggression (Borders, Earleywine, & Jajodia, 2010). They also react more adaptively (e.g., reduced repetitive negative cognitions and anger) to perceived workplace injustice (Long & Christian, 2015), a key feature of organizational politics job demand (Kacmar & Carlson, 1997).

Clearly, mindfulness promotes cognitive regulation of negative emotions, which may engender a sense of control over stressors (i.e., IC and POPS job demands) as well as other resources (i.e., job control), enhancing adjustment. However, while mindfulness may propel a worker to engage in a more flexible and autonomous action in the face of stressors, it may not be sufficient against high levels of IC and POPS job demands, as found in this study. A possible explanation may be that the trait mindfulness provides limited self-regulatory resources that get exhausted in response to high IC and POPS job demands. In addition, and as discussed before, job control at high levels may be perceived as a stressor (Spector, 2000), consuming mindfulness' coping resources, and further diminishing its effect on demands. Supporting the idea of mindfulness being a limited resource, past intervention research (e.g., Bostock et al., 2018; Gregoire,

Lachance, & Taylor, 2015; Hanley, Garland, & Black, 2014; Mellor, Ingram, Van Huizen, Arnold, & Harding, 2014; Quaglia et al., 2019) has shown that relative to controls, individuals actively cultivating mindfulness through meditative training and practice exhibit greater and sustained self-regulatory capacity (e.g., cognitive, affective, behavioral), linked with most beneficial outcomes (i.e., reduced stress, strain, including burnout). Therefore, workers may need to engage in mindfulness practice to develop resiliency against high levels of IC and POPS job demands.

Taken together, mindfulness represents a promising person variable in the hindrance job demand-control model. Its enhanced capacity for more direct affective regulation likely underlies the observed moderator effects. Workers can tap into this internal resource to ameliorate emotions associated with IC and POPS job demands, which in conjunction with job control can broaden their behavioral responses. Notwithstanding such benefits, mindfulness may offer a limited autonomous self-regulatory capability, that can get more readily depleted with higher levels of job demands. Regular meditative practice may be necessary to both restore and increase the mindfulness skill reservoir from which to draw when responding to high hindrance job demands. A strengthened trait of mindfulness may attenuate the effects of potent hindrance job demands and weaken the job demand-burnout relationship, as posited by the JDC model.

Control Effects

Out of the three control variables, sex and age emerged as significant predictors of burnout. More specifically, sex positively related to burnout in all models for the

moderator of mindfulness analyses, indicating that being female was associated with higher burnout. This finding is constant with past research showing that women are more likely than men to be at risk for burnout (e.g., Dyrbye et al., 2018; Innstrand, Langballe, Falkum, & Aasland, 2011). Such gender differences in burnout have been linked with women facing home demands (e.g., child and elderly care), which in conjunction with work demands result in greater stress and burnout (McCormack & Cotter, 2013).

In terms of the main effect of age, the results showed that it was negatively related to burnout in all RC models and the POPS (nonlinear) model in the moderator of LOC analyses, indicating that being older was associated with lower burnout. This finding adds to the existing research, which has consistently documented older age being related to reduced burnout risk (e.g., Lim, Kim, Kim, Yang, & Lee, 2010; Schadenhofer, Kundi, Abrahamian, Stummer, & Kautzky-Willer, 2017; Sun et al., 2019). Older workers, as found by Johnson, Machowski, Holdsworth, Kern and Zapf (2017) and concluded by Doerwald, Scheibe, Zacher, and Van Yperen (2016) have an enhanced emotion management ability, which tends to improve with age and may help alleviate burnout.

Finally, the control variable of hours worked showed no significant association with burnout and interestingly, its regression coefficient was negative, suggesting that an increase in time spent at work is inversely related to burnout. This finding corroborates past research data (e.g., Marek et al., 2019; Mendelsohn et al., 2019; Sun et al., 2019), which has shown that higher number of hours worked does not affect burnout, implying that other organizational factors such as job demands and job control may exert a far more influential role. The current findings provided support for this contention.

Evidence for the Strain Hypothesis of the Job Demand-Control Model

Although not hypothesized in the current study, the data provided some supportive evidence for the JDC model's strain hypothesis. The strain premise asserts that jobs characterized by high job demands, low job control, and a low level of another resource (i.e., LOC or mindfulness) have the most adverse impact on employees' health, leading to strain (i.e., burnout) (Karasek, 1979). Such high strain work conditions were confirmed in this study by detected interactive effects of high IC (nonlinear LOC analysis) and RC (mindfulness analysis) job demands and low job control resulting in greater burnout. Additional support for the strain hypothesis was observed in the exploratory mindfulness analyses where interactive effects of high IC or POPS job demands, low job control, and low mindfulness lead to higher burnout. These findings are in line with previous reports (e.g., de Jonge et al., 2010; Schmidt & Diestel, 2011) demonstrating that concurrent high demands and low resources lead to high strain outcomes.

In addition, partial support for the strain premise was seen in all hindrance job demands having significant and positive and mindfulness having significant and negative main effect on burnout. Similar additive effects have been reported in past JDC model (e.g., Cheung et al., 2015; Dawson et al., 2016) and mindfulness research (e.g., Fisher et al., 2017; Grover et al., 2016; Westphal et al., 2015) examining burnout and other well-being outcomes. As indicated by current and extant research findings, high job demands have detrimental, while high mindfulness has beneficial impact on worker health.

Limitations of the Study

The results obtained in this study should be considered in light of several important limitations. First, a cross-sectional design was employed, which precludes from drawing causal inferences. Although the JDC model's buffer hypothesis predicts that a combination of high demands and high control, including high level of another resource lead to reduced strain, the analyses performed could only reveal the strength and direction of the relationship between the key variables. Thus, it was not possible to determine any possible casual or reciprocal links.

Second, all data were collected using subjective measures, increasing the risk of results being impacted by common method variance, and more specifically, the self-report bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For instance, scores on the measures used may have been inflated or deflated due to participants attempting to present themselves in most favorable light or being influenced by either positive or negative affective tendencies or states at the time of responding. Such response biases may have not only masked true relationships between variables, but also contributed to overestimated main effects, affecting detection of interaction effects (Evans, 1991). Although some researchers (e.g., Judge, Erez, & Thoresen, 2000) recommend to statistically control for negative affectivity in order to reduce its biasing influence, this was not done in this study. As contended by Spector et al. (2000) and others (e.g., Epstein & Katz, 1992), partialing negative affectivity is not always the best option as it carries the risk of reducing true variance from the examined stressor and strain relationships.

Third, the low internal consistency of the LOC measure might have negatively impacted the obtained results. In particular, the reliability of the I-E scale (Rotter, 1966) contributed to the reliability of the three-way product terms, which likely reduced the power necessary to detect interaction effects (Busemeyer & Jones, 1983). In addition, the general assessment of the LOC construct may have been limited in predicting responses in a work context. Past research has shown that domain specific measures of LOC such as Spector's (1988) Work Locus of Control Scale have stronger relationships with various work-related outcomes, including burnout (Wang, Bowling, & Eschleman, 2010). The RC measure also had a low alpha coefficient due to odd performance of some of its items. While removal of the problem items improved the alpha, the use of a reduced measure may have had an impact on the results.

Fourth, the exploratory analyses involved the use of a step-down procedure, which involved removal of all two-way interaction terms and which may have resulted in biased effects. However, the unchanged null results for the LOC variable suggest that this was not the case. In addition, the recommended method for testing higher-order interactions was followed (Aiken & West, 1991), in that the variables forming the interaction were entered into the regression analysis prior to the three-way term, increasing confidence in the obtained results.

Finally, the use of a nonprobability-based online panel as a sample source likely represents another limitation due to self-selection bias. Some potential respondents may have declined to participate or agreed to complete the survey based on promised rewards. Also, some "professional respondents" or individuals who complete large number of

surveys on regular basis may have engaged in satisficing characterized by reduced cognitive effort when responding to questions (Baker et al., 2010). While this raises concerns for the overall quality of the data, research has shown that the impact of such responding is minimal (Greszki et al., 2014). In addition, while quota sampling was used to obtain a sample representative of the target population, the self-selected participants likely differed in some important characteristics from those representing the population of interest, limiting the generalizability of the results. For instance, the current sample consisted of greater number of younger and more educated individuals, with half of them being employed in “for profit” sectors and residing in the Southern region of the United States. Also, while the sample was culturally diverse and resembled the current U.S. census, no consideration was given to the impact of culture related factors on the findings.

Recommendations for Future Research

This study was the first to examine the buffer hypothesis of a revised hindrance job demand-control model with LOC and mindfulness as conjunctive moderators in prediction of burnout. Therefore, future research is needed to replicate the findings with similar heterogenous samples. Also, new investigations may employ longitudinal or experimental designs that would help illuminate the causal associations between variables, as suggested by the JDC model’s buffer hypothesis. Using a context specific measure of the LOC construct may also help clarify this variable’s moderating influence. Equally helpful would be the use of objective measures of job control and job demands as well as considering the potential of a curvilinear relationship between the variables.

As the findings showed, the interactive effects are more likely to be detected when emotional job demands of IC and POPS are accompanied by an emotional resource of mindfulness. Therefore, future tests of the buffer hypothesis should consider the domains of key variables (e.g., cognitive, behavioral, emotional) and whether or not they represent qualitatively same or similar dimensions. In particular, more research is needed on the moderating role of mindfulness on the JDC model's dimensions. For example, researchers could expand on the current results and examine the buffer hypothesis with state and/or trait mindfulness following a meditative practice or training. Equally informative would be a study evaluating both dimensions of the LOC construct rather than focusing on the internal foci as in the current study. Research has shown that internals and externals differ in their responses to job demands, with the extant empirical evidence being both limited and equivocal (e.g., Daniels & Guppy, 1994; Meier et al., 2008; Parkes, 1991; Rodriguez et al., 2001). Such research would enhance understanding of the mitigating role of mindfulness and LOC on the hindrance job demand-control and burnout relationship and possibly offer more explicit theoretical and practical insights.

In addition, future studies of the JDC model with hindrance job demands may consider inclusion of person moderators such as emotional stability, emotional intelligence, or self-control capacity. The trait of emotional stability is characterized by positive affect and increased ability to regulate negative emotions (e.g., anxiety, anger), which has been found to increase person's resiliency against stressors and strain (i.e., burnout) (Alessandri et al., 2018). Similarly, emotional intelligence is an attribute that refers to an enhanced awareness and understanding of emotions in self and others,

including their management and expression, which has also been found to protect individuals from the effects of stressors and burnout (Sczygiel & Mikolajczak, 2018). A rather new attribute of self-control capacity relates to person's greater control over impulses, negative emotions, and thoughts, which has been linked with improved psychological adjustment to occupational stressors (Schmidt et al., 2012). All three dispositions represent emotional resources that match with emotional job demands as per the matching hypothesis (de Jonge & Dormann, 2006), and thus could potentially modulate the hindrance job demand/control-burnout relationship as predicted by the buffer premise.

Although gender and age are typically examined as covariates in JDC research, current and past research findings suggest that there are differences in susceptibility to burnout between males and females (e.g., Dyrbye et al., 2018) and younger and older individuals (e.g., Sun et al., 2019). Therefore, future research may consider their adjunctive moderating or mediating influence on the hindrance job demand-control model. Also, examining culture related factors (e.g., nationality, ethnicity, cultural values) as additional moderators may be of value. For example, nationality has been found to influence workers' appraisal of stressors and adjustment, including perceptions of job resources such as job control (Fila et al., 2017). Thus, cultural factors may uniquely modulate the stressor-strain relations, leading to differential outcomes. Such information would inform development of the JDC theory and guide future research inquiries.

Theoretical, Practical, and Social Change Implications

Theoretically, the results of this study support the notion that the environmentally based JDC model is limited and that there may be merit in expanding it with additional person variables to explain the complex stressor-burnout relationship. Most notably, the interactive effect of job demand and control as predicted by the buffer premise and representing the central tenet of the JDC model may be contingent on the match between resources, stressors, and strains. Thus, the boundary condition for the JDC model is likely not the type of the stressor (i.e., hindrance demand) as initially suggested, but rather the qualitative match among its components.

The inclusion of emotional hindrance type of demands in this study brought to the fore the need for the JDC model to account for the important role of emotions in occupational stress process. As contended by Lazarus (1999) and others (e.g., Spector & Goh, 2001), emotions influence the stressor-strain relations and failure to consider them in theories significantly restricts understanding of employees' experience of strain. In the work context, negative emotions may be triggered by various job demands and job control being a behavioral response, may not provide coping skills necessary for their effective management. Although personality may influence emotional experiences, shaping the appraisal of demands (Volrath, 2001), it seems that it must have a more direct impact on the emotional states to exert the necessary buffering influence. This was especially evident in case of the LOC variable, which likely provided limited emotional control and at high levels appeared to operate as a stressor, losing its buffering capacity.

Therefore, the JDC model incorporating emotional demands may require an inclusion of similar in nature moderators in order to produce most impactful moderator effect.

In terms of practical relevance, the present findings do not support the proposition held by the buffer hypothesis that increasing workers' job control without reducing the level of demands will result in less strain (i.e., burnout). As indicated by the data, high job control did not exert the predicted moderating influence, and when accompanied by high mindfulness, it attenuated the effects of moderate, not high levels of job demands. Because hindrance job demands were consistently associated with greater burnout, prevention efforts may require their reduction and/or the presence of additional protective person factors (i.e., mindfulness). While the first option may be difficult to achieve, the latter suggests the possibility of an intervention at an individual level. The moderating impact of dispositional mindfulness observed in this study showed that it may be a valuable internal resource for workers responding to emotional hindrance job demands. Although additional research is warranted on the moderating role of both trait and state mindfulness in the context of the JDC model, a myriad of extant intervention research has linked mindfulness training with enhanced and sustained emotion regulation and reduction in stress, including burnout (e.g., Kinnunen et al., 2018; Shapiro et al., 2011; Zolnierczyk-Zreda, Sanderson, & Bedynska, 2016). Thus, at the very least, employers concerned with employees' emotional well-being should explore mindfulness training as a potentially beneficial component of their workplace stress-reduction programs.

Finally, the findings have social change implications in that they demonstrate the adverse effects of hindrance job demands on worker health, and point to a potential

protective person factor (i.e., mindfulness). Such information can help shape organizational policy, planning, and job design efforts focused on improving the well-being of individual workers and reducing as well as preventing burnout. Although it may be easier and more practical to implement interventions at the individual level (e.g., offer mindfulness training to enhance coping skills), institutions should not lose sight of the critical role they have in ensuring psychological health of their workers. Efforts aimed at improving the work conditions by reducing detrimental hindrance job demands like organizational politics or role conflict are likely just as important and needed as enhancing individual resistance to work stressors.

Conclusion

Concerned with the adverse impact of burnout on individual and organizational health, this study sought to delineate the path from stress to health by testing the seminal buffer hypothesis with a revised hindrance job demand-control model. I assumed that the predictive power of the premise; that is, the moderating role of job control on the job demand-burnout relationship, will be improved by an integration of hindrance job demands as well as person factors of LOC or mindfulness. Although the results did not support the hypothesized interactive relationships, the data provided some valuable insights. Perhaps most enlightening was the likely need for stressor/strain specific resources that would most efficiently protect workers from the detrimental effects of demands. The qualitative match among resources, stressors, and strain may constitute an important boundary condition for the JDC model, which could increase chances of finding the seemingly elusive buffering effects. While hindrance job demands emerged as

quite potent work stressors, unlike LOC, mindfulness clearly has the potential of offering needed protection. It is my hope that future tests of the buffer hypothesis of the original and expanded JDC models will consider this study's findings, recommendation made, and expand theoretical and practical knowledge on how to prevent the pervasive burnout phenomenon.

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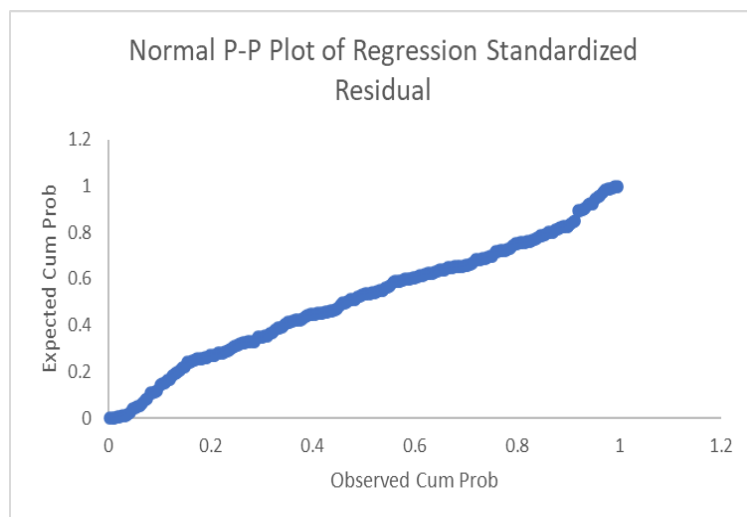
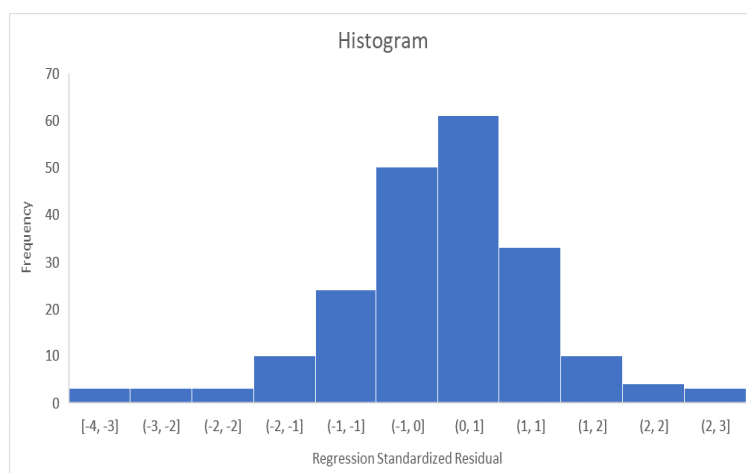
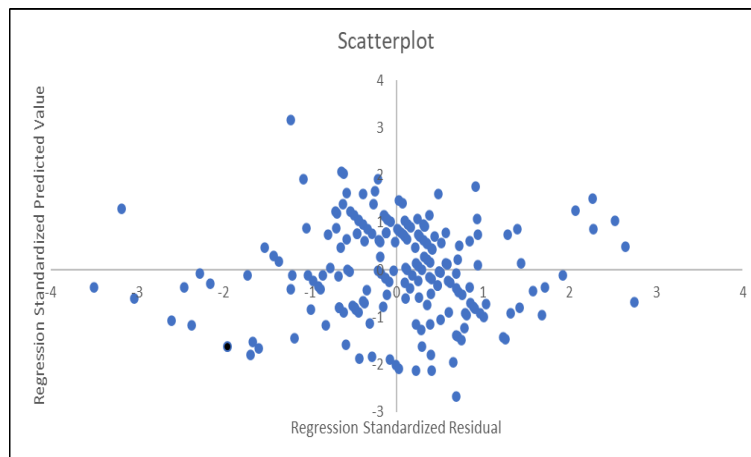
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Appendix A: Burnout and Locus of Control: Scatterplot, Normal P-P Plot of Residuals,
and Histogram



Appendix B: Burnout and Mindfulness: Scatterplot, Normal P-P Plot of Residuals, and

Histogram

