Breaking Down or Breaking Through: The Role of Appraisals in the Challenge-Hindrance Stressors' Effect on Work Engagement and Performance

Raghid Al Hajj

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_____ Chair
Dr. Kamila Sobol

_____ External Examiner
Dr. Usman Raja

_____ External to Program
Dr. Holly Recchia

_____ Examiner
Dr. Ariane Ollier-Malaterre

_____ Examiner
Dr. Linda Dyer

_____ Examiner
Dr. Ingrid Chadwick

_____ Thesis Supervisor
Dr. Muhammad Jamal

Approved by_____
Dr. Kathleen Boies, Graduate Program Director

12/14/2020

_____
Dr. Anne-Marie Croteau
John Molson School of Business

ABSTRACT

Breaking Down or Breaking Through: The Role of Appraisals in the Challenge-Hindrance Stressors' Effect on Work Engagement and Performance

Raghid Al Hajj, PhD
Concordia University, 2020

This thesis investigates the effects of work-related stressors on in-role performance and work engagement. First, it explores whether stressors that have long been categorized as challenging or hindering are appraised commensurately as challenging and hindering, respectively, or whether they are appraised as both challenging and hindering simultaneously. Second, it attempts to better explain the contradictory findings surrounding the relationships between stress and in-role performance and work engagement by including stress appraisals as a mechanism driving these relationships. Finally, this thesis also looks at whether one's beliefs about the debilitating and enhancing characteristics of stress could help to explain not only how stressors are appraised, but also how appraisals eventually influence performance and engagement. On five consecutive work days, 487 Canadian and American full-time employees were asked to report on their stress mindset and to appraise a set of eight stressors destined to capture a wide array of challenging and hindering work stressors, after which they then evaluated their performance and engagement at work. Results showed that employees rarely appraised stress as uniquely challenging or hindering and, in fact, most stressors were appraised as being both at the same time. In addition, challenge and hindrance stressors were evaluated as being less hindering and hindrance stressors were evaluated as being more challenging when employees had increasingly positive views about stress. Stress mindset was thus shown to be an important boundary condition that appears to modulate the genesis of stress appraisals. In addition, including stress appraisals was shown to be beneficial in explaining the stressors' relationship to performance and engagement, with challenge and hindrance stressors boosting and hampering these outcomes, respectively. Although stress mindset was less effective in explaining the appraisal-to-outcome links, it nevertheless played a buffering role by reducing the negative influence of hindrance appraisals on work engagement. This research is important in clarifying some misconceptions about how workplace stressors are evaluated and in providing novel evidence that stress mindset is a key variable in the study of stress at work, in general, and that of stress appraisals, in particular.

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CHAPTER ONE

1. INTRODUCTION

Have you ever felt so overwhelmed at work that you wondered how you were going to muster the energy to overcome the obstacles being faced? Have you ever experienced so much stress that your dedication and job performance were adversely affected? The reality is that most of us have encountered situations like these in which conditions stifle our goal pursuit and hinder our devotion to our work. Despite these challenges, however, there have also been times when we have coped positively with stress, resulting in a bolstering to our drive and an overall feeling of accomplishment. This thesis will try to shed light on such experiences by studying how people perceive stress and how those perceptions influence their in-role performance and engagement at work.

Ever since pioneering research on role stressors first brought to light the relationships between individuals' stressful work conditions and their strained responses (Caplan, Cobb, French, Harrison, & Pinneau, 1975; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; Katz & Kahn, 1978; McGrath, 1976), job stress has largely been depicted in a negative manner with people equating stress with distress (Jamieson, Crum, Goyer, Marotta, & Akinola, 2018). Variously called a "plague" (Blythe, 1973, p. 14) and an "epidemic" (Wallis, Thompson, & Galvin, 1983, p. 1), stress costs US employers over $300 billion annually (Rutigliano & Frost, 2017) and it is believed to be associated with the leading six causes of death (Crum, Salovey, & Achor, 2013; Sapolsky, 1996; Schneiderman, Ironson, & Siegel, 2005). In Canada, 62% of employees report that work is their main source of stress, with 27% claiming they experience 'high' to 'extreme' stress levels on a daily basis (Statistics Canada, 2017).

Scholars in occupational health psychology generally define job stressors as work conditions having the propensity to undermine the health and wellbeing of employees (Hurrell, Nelson, & Simmons, 1998). Moreover, they have differentiated chronic work-related stressors from intense or acute stressors. The most common distinction between these types of stressors rests on their temporality (Dougall & Baum, 2012); whereas the former affect workers through an extended duration and a high probability of recurrence, the latter are characterized by a greater intensity, shorter duration, and a lower likelihood of recurrence (Barling, 1990; Carayon, 1995; Gottlieb, 1997). This distinction between chronic and acute stressors, however, has been criticized as being overly simplistic. For example, scholars have raised three issues with this simplification: 1) individuals may adapt to (or become habituated to) a given stressor following a lengthy exposure; 2) acute stressors may lead to a rippling effect in stress appraisals long after the event or episode is over (i.e., having long-term effects); and 3) the terms 'acute' and 'chronic' may be arbitrary to begin with (see Baum, Cohen, & Hall, 1993). Compas, Connor, Osowiecki, and Welch (1997) argue that this problematic distinction becomes even hazier when one considers that these two types of stressors are often interrelated.

Regardless of the above challenges, chronic work stressors are the most commonly researched of the two (Beehr, Jex, Stacy, & Murray, 2000) and include examples such as role conflict, role ambiguity, job overload, and an absence of social support among others (van Der Ploeg & Kleber, 2003). They are typically conceptualized and measured in generic ways (i.e., same across different jobs), while acute stressors are more likely to be job-specific (Beehr et al., 2000), even though the characteristics of chronic/acute and generic/specific are in fact distinct

dimensions. A central element in understanding chronic stress is the occurrence of intrusive thoughts stemming from the direct experience with a stressor, particularly when the stressor has long subsided. These thoughts constitute one's cognitive arsenal in processing the threatening event and, as such, help the stressed individual "work through the situation" (Dougall & Baum, 2012, pp. 58). Because these intrusive thoughts are both unwanted and not fully under one's control, they often exacerbate and perpetuate the chronic stress (for a detailed review of the impact of stress on health-related outcomes, see Dougall & Baum, 2012).

Over 20 years ago, Jamal (1999) asserted that, faced with chronic job stress, employees will gravitate away from 'normal functioning' (p. 58) toward a dysfunctional work style adversely affecting both the individual and the organization (see also Jamal, 1984; Jamal & Badawi, 1993, 1995). This shift toward both reduced productivity and well-being from chronic stress is thought to be due to an employee's inability to recover fully between workdays, thereby causing sustained physiological strain (e.g., elevated levels of cortisol) and ensuing disease (Jamal & Preena, 1998).

In contrast to chronic stressors, acute ones are sudden disruptive alterations that, by their nature, are more job-specific and include examples such as fire-fighting units and lifeguards attempting rescues, flight crews and hospital intensive-care units during emergencies, and police arriving at the scene while violent crimes are in progress (Eden, 1982). In most organizations, however, critical changes occur infrequently. As such, studies on organizational stress have been mainly impelled by theoretical advances that deal with ongoing or chronic environmental and work-related conditions impacting role behaviors rather than with unexpected events spurring transient episodes of acute stress (Eden, 1982; Jex & Britt, 2008). For these reasons, and in light of the methodological challenge of spending unknown amounts of time to potentially capture an episodic event that promises to trigger acute stress, this thesis will focus on chronic organizational stress.

In spite of the bleak statistics and undesirable outcomes of stress outlined above, not all stress is detrimental. Over 40 years ago, Selye (1976, 1982) distinguished between 'good stress' or eustress and 'bad stress' or distress, a distinction that was based on the type rather than the level of stress. This distinction remained controversial, particularly in the area of job performance, with the majority of studies showing a negative relationship between stress and performance. Muse, Harris, and Field (2003) summarized 25 years' worth of research on the topic of stress and performance and found that nearly half the studies (46%) showed a negative linear relationship between the two, while 13%, 12%, and 4% showed a positive linear relationship, no relationship, and an inverted U-shaped relationship, respectively (see also Jamal, 1984, 1985). The authors also noted that 35% of studies showed mixed results.

Cavanaugh, Boswell, Roehling, and Boudreau (1998, 2000) built on Selye's (1976, 1982) dichotomy and further differentiated work stressors into two categories. Initially, their 1998 working paper drew largely on the conservation of resources theory (COR; Hobfoll, 1989) which holds that individuals seek to maintain, defend, and acquire valued resources while remaining vigilant and experiencing threat at the potential or actual loss of such resources. However, their 2000 published paper saw a shift in their theorizing. Rather than basing their arguments on COR theory, they drew on the transactional theory of stress (Lazarus, 1981; Lazarus & Folkman, 1984), which explains how a person's appraisals of events influence various outcomes such as emotions and social functioning. Cavanaugh et al. (2000) made the distinction between challenge and hindrance stressors. The authors defined 'challenge stressors' as occupational demands that, while stressful, provide an individual with potential gains such as the opportunity for growth and

development. Examples of such stressors include workload and work complexity. On the other hand, they defined hindrance stressors as demands or circumstances that impede one's goal pursuits and achievement at work, and these include stressors like role conflict and role ambiguity (see also Podsakoff, LePine, & LePine, 2007). Following a similar categorization of stressors as either hindrance or challenge, researchers using cross-sectional (Yao, Jamal, & Demerouti, 2015), longitudinal (Tadić, Bakker, & Oerlemans, 2015), and meta-analytic methods (LePine, Podsakoff, & LePine, 2005) have relied on this model of stress to better understand how encounters with various stressors affect a range of outcomes for individuals such as job performance, citizenship behaviors, and commitment, among others.

Collectively, the literature suggests that each of these two broad categories of stressors are believed to differentially impact critical employee outcomes, such as work engagement and performance (Britt & Jex, 2015; Crawford, LePine, & Rich, 2010; Jamal, 2007). That is, not all individuals perceive or appraise a given stressor the same way. In addition, people differ in their beliefs about stress *itself*, with some individuals seeing stress as something that propels them toward self-improvement, while others believing it to be a counterproductive phenomenon that must be curtailed. Therefore, the extent to which a given stressor will affect an employee will depend not only on how a particular stressor is appraised by each employee but also on individual differences that exist between employees.

Therefore, the goal of this thesis is to investigate how workplace stressors are appraised and, subsequently, how each of these appraisals affects employee work engagement and in-role performance. More specifically, I look at how individuals appraise stressors that have been deemed to be either challenging or hindering in previous research, investigate the appropriateness of this dichotomization using theory and data, and explore the elusive relationship between stressors and both performance and work engagement while incorporating stress appraisals. In addition, these relationships will be explored while taking into consideration some individual differences that are thought to act as critical boundary conditions. The theoretical model I intend to test is shown in Figure 1 below. Briefly, the model describes how individuals appraise stressors – traditionally categorized into either challenge or hindrance – and how their beliefs about the nature of stress and its influence affect such appraisals. It then explores how challenge and hindrance stress appraisals influence work engagement and perceived in-role performance and how an individual's beliefs about stress can better explain these.

Insert Figure 1 about here

This research makes three principal contributions. First, it promises to help us better understand the effects of different stressors (i.e., challenge, hindrance) on critical employee outcomes that are tantamount to organizational success, namely work engagement and in-role performance. Researchers have barely scratched the surface when it comes to analyzing these relationships (see meta-analysis by Mazzola & Disselhorst, 2019). Much of the research thus far has portrayed employee stress in a negative light without considering its potentially positive effects. For example, Bakker and Demerouti (2007) have noted that the majority of studies have focused largely on negative outcomes, such as burnout, illness, and repetitive strain (p. 310). Departing from adverse outcomes and focusing more on positive ones, this work also hopes to reveal which aspects of a given job employees consider to be more challenging than hindering,

thereby allowing managers to diagnose potential problems and allocate organizational resources more efficiently. In this vein, it will also help managers to both design and select improved stress intervention and management solutions for their organization.

Second, it makes a case for why stress appraisals, as opposed to the two-factor model of challenge and hindrance stressors, might be potentially better suited to explain the variance in workplace outcomes. As recent reviews show (e.g., Mazzola & Disselhorst, 2019), research involving appraisals is grossly lacking. Therefore, I argue that appraisals are essential to an improved understanding of how people interpret stressors. In doing so, I nevertheless include the dichotomization of stressors as challenges and hindrances in my model because this framework has been pervasive in the literature. While a rethinking of this model is not the premise of this thesis, I will maintain that it may be necessary in light of recent pleas among stress researchers[1].

And third, not everyone holds the same beliefs about the effects of stress. Therefore, accounting for individual differences in such beliefs will clarify our understanding of how employees' attitudes toward stress and its repercussions influence the relationships between 1) stressors and stress appraisals, and 2) these appraisals and employees' work engagement and in-role performance. Having such knowledge promises to empower managers and employees about optimal employee-job fit.

If my dissertation's contributions are not convincing enough, perhaps readers should consider an article published recently in the *Journal of Organizational Behavior* (Mazzola & Disselhorst, 2019) in which the authors passingly recommend that the challenge-hindrance model's predictive power would greatly improve if researchers accounted for both stressor appraisals and stress mindset! Although disappointed as I may be in having to accept that Mazzola and Disselhorst (2019) beat me to the proverbial punch in their suggestion, I am nevertheless relieved that my conclusions are endorsed by other experts in the field, even though they did not empirically test their claims as I do here.

This thesis is structured as follows. First, I trace the evolution of work stress theory over the last 50 years, with a particular emphasis on the frameworks that have guided the motivation for this research. Second, I develop a conceptual model (Figure 1) conveying how stressors are differentially appraised thereby leading to varying degrees of two critical work outcomes, namely work engagement and in-role performance. Third, I test this model using longitudinal data collected from American and Canadian full-time employees working in various industries. They were asked to reflect on their daily experience at work and to report on their encountered stress as well as on their work engagement and perceived in-role performance. Fourth, after presenting and discussing the study's major findings, I describe the limitations inherent in this research. Lastly, I discuss the main managerial implications and conclude with the theoretical contributions and some fruitful opportunities for future research.

[1] See the call for contributions in the journal *Frontiers in Psychology: Organizational Psychology* from topic editors M. Grawitch, L. Barber, M.P. Leiter, and J. Mazzola to the forum "Stress and stress management: Pushing back against existing paradigms" (https://www.frontiersin.org/research-topics/12176/stress-and-stress-management---pushing-back-against-existing-paradigms, retrieved July 8, 2020).

CHAPTER TWO

2. THEORETICAL BACKGROUND

The following chapter sets the scene for the conceptual development of my model by introducing the topic of stress in the workplace and summarizing the foundational theoretical frameworks in the literature. These models include the job demands-resources model of stress, person-environment (P-E) fit, the transactional theory of stress, the job demand-control model, and the effort-reward imbalance model of stress.

2.1. The Forces of Change Acting on Stress in the Workplace

The COVID-19 crisis swept indiscriminately throughout the globe beginning in late 2019, and since then has precipitated on labour markets at a time when worker conditions were threatened by artificial intelligence and employment without permanency was growing. Experts claim that the outlook remains dim for the foreseeable future: jobs involving routine tasks will continue to vanish without replacement even as the global economy improves. In July 2020, the World Economic Forum's (2020) Chief Economists Outlook outlined an agenda whose goal is to address the political, economic, and social disturbances caused by the COVID-19 pandemic. Needless to say, workplace stress is currently at an all-time high (Robinson, 2020). A recent Gallup poll found that, in June 2020, employees were 20% less likely to report having a clear direction by their leaders and felt less prepared to do their job than in the previous month due to the pandemic (Gandhi, 2020).

Even before this global pandemic, earlier reports from the World Economic Forum (2012) on global mental health determined that the costs associated with stress-related consequences in the workplace, examples of which are absenteeism, turnover, and lapses in productivity, mount to some $2.5 trillion annually (for a systematic review of the cost of work-related stress to society, see Hassard, Teoh, Visockaite, Dewe, & Cox, 2018). The Quality of Working Life Survey compiled by Worrall and Cooper (2016) polled about 10,000 managers from a cross-section of several industries and managerial levels and found that 92% of managers work longer than their assigned hours. In fact, this translated to one more hour daily compared to 2012 or approximately 29 days of unpaid work a year. Of this cohort, 78% and 67% reported that work volume and pace had increased, respectively. More importantly, however, is the finding that 54% of managers stated that toiling longer hours was increasing their stress levels.

Dewe and Cooper (2017) list several forces of change that have accelerated the increase of workplace stress over time. Globalization, described as "an undeniable and inescapable part of contemporary experience" (in Bartelson, 2000, p. 180), is one such force which has demanded new work designs, career insecurity, and incessant change. Another is technology with its effect on the speed at which innovation occurs and its insistence that work can now be carried out at any time and location (Tan & Wang, 2010). Finally, demographic (e.g., generational differences, migration, gender issues) and societal changes (e.g., sustainability trends) are additional factors that contribute to what many believe is a new workforce reality (Haigh & Hoffman, 2012; Turner & Williams, 2005). For these reasons, stress research is being ushered into a new age of inquiry. However, one cannot neglect the sheer volume of extant scholarly work on the subject, and theories abound as to its etiology. What is described next is a succinct overview of the important theories of stress that have helped guide us through the cornucopia of perspectives couching the majority of discussions in the literature.

2.2. The Evolution of Theories of Work Stress

2.2.1. The person-environment (P-E) fit framework and stress at work

Spanning nearly seven decades, Kurt Lewin's body of work remains instrumental in our understanding of work behavior in general, and work stress in particular (Edwards, 1996). More specifically, his field theory (Lewin, 1943) specified that behavior observed at work was a mere function of the interaction between the 'environment' in which the behavior manifested itself (or field) and the characteristics of the 'person' (or group) enacting the behavior. At the core of this P-E framework is the premise that stress originates from the extent to which the environment is congruent – that is, matches – with the person (Edwards, Caplan, Van Harrison, 2000). Stress is thus defined as the level of mismatch between these two broad constituents. According to the model, a match or fit occurs in two distinct ways. The first type of fit is between an individual's 'values' (i.e., needs, goals) and the environment's ability to satisfy these values with 'supplies' on hand (S-V fit). The second is that between the environmental 'demands' imposed on the individual and his or her 'ability' to meet them (D-A fit) (French, Caplan, & Van Harrison, 1982; see also Dewe & Cooper, 2017). In a review, Edwards (2008) uttered that one of the weaknesses of P-E fit theory rests with the nebulous meaning of fit and the need for researchers to address this conceptual weakness. This thesis heeds Edwards's (2008) recommendations by making a case for why stress appraisals are needed, a subject to which I turn to next.

2.2.2. The process-oriented transactional model of stress

The idea that work stress can best be seen as a transaction taking place between the individual and the environment derives from Lazarus's seminal work (1966; for a contemporary review, see Lazarus, 1999). By *transaction*, Lazarus meant the psychological processes that connect a person to a given environment and, thus, what he proposed was a causal pathway underlying the stress process (Dewe & Cooper, 2012). Central to Lazarus's theory is the appraisal mechanism which has been broadly characterized as the "relational meaning that the individual constructs from the person-environment relationship" (Lazarus, 2000, p. 665). In other words, appraisals act by binding an individual to his or her environment. There appear to be two types of appraisal. The first type, or *primary appraisal*, helps the individual assess what is at stake in a particular stressful episode and, in doing so, endows the individual with some purposeful meaning to the encounter. Lazarus and Folkman (1987) define 'stakes' as anything that concretely represents an individual's goal and/or commitment hierarchy. Thus, stakes are highly personal and vary widely between persons. The measurement of primary appraisals have traditionally been carried out via two pathways (Lazarus & Folkman, 1987). First, the cognitive pathway is responsible for assessing the stakes at play and, in the context of work, often include evaluations of one's self-esteem such as appearing competent or failing to achieve an important goal. Second, the affective or emotional pathway involves the range of emotions that people report during a stressful episode. For example, these encounters can trigger fear and worry when they are threatening, anger and disgust when they are harmful, eagerness and confidence when they are challenging, and relief and happiness when they are either benign or beneficial.

The second type, or *secondary appraisal*, shifts the focus of attention away from an individual's risk and emotion elicitation toward an assessment of how stress can be coped with. To assess people's various alternatives for coping with a particular stressful encounter, Lazarus and Folkman (1987) employ four different approaches that ask whether the encounter 1) could be altered; 2) needs to be accepted as is; 3) necessitates more information before it could be dealt

with; and 4) requires self-restraint as opposed to doing what one desires. To do this assessment properly, therefore, individuals must evaluate what resources are available to mitigate the stress while gauging implications for wellbeing (Lazarus, 1999, 2001a). Collectively, these appraisals are thought to provide the rationale for why some people differ with respect to how they react to a given stress encounter. In fact, some stress scholars believe that ignoring appraisals results in neglecting the most fundamental aspect of stress (Dewe & Cooper, 2012). While Lazarus's transactional theory has been impactful within the general realm of scholarship on stress, its impact within occupational stress and organizational behavior per se has been surprisingly subdued (Jones & Bright, 2001; for a recent commentary, see Mazzola & Disselhorst, 2019).

2.2.3. The job demand-control model of stress and its variant

In his pioneering work, Karasek (1979) aimed at demonstrating that stress arises from the aggregate effects between demands that are placed on a particular worker (i.e., time pressure, role conflict) and the job-decision latitude or control that he or she has in dealing with those demands. Decision latitude was further comprised of two components, skill discretion and decision authority (Wall, Jackson, Mullarkey, & Parker, 1996). Increases in these constituents of control are thus believed to mitigate the effects of stressors by enabling individuals to confront their job demands at the most appropriate time and in ways that are most optimal. In other words, control provides the opportunity for individuals to adjust to demands according to their needs and circumstances (Karasek & Theorell, 1990).

Accordingly, having high demands combined with low control produce high-strain jobs (e.g., nurse's aide), while low demands and high decision latitude lead to low-strain jobs (e.g., architects). In between reside what Karasek viewed as 'active jobs' (e.g., physicians) having high demands in which workers have much control, and 'passive jobs' (e.g., janitors) wherein both demands and control are low. Such combinations of job demands and the degree of discretionary control one has in addressing them formed the basis of the job demand-control model, or job strain model, which became one of the most influential models in research on the relationship between work and health for two decades (Van der Doef & Maes, 1999). According to the model, having decision latitude over work processes helps decrease employee stress but increases learning, while demands increase both learning and stress.

In the 1980s, Johnson and Hall (1988) refined Karasek's model to include a key resource, namely social support, since researchers had long claimed that interactions with coworkers could modulate the impact of psychological demands in the workplace. According to this job demand-control-support model, or JDCS model, the social dynamics taking place on the job in addition to the job's demands and the latitude or control one possessed in meeting them were the critical factors in the development of any adverse health reactions. Thus, jobs typified as having elevated demands, reduced control, and low support – with isolation representing the extreme case – were considered to be the most harmful occupational contexts. While this 'iso-strain' hypothesis attracted much empirical attention, findings were mixed. On the one hand, Van der Doef and Maes's comprehensive review (1999) revealed that longitudinal studies were generally non-supportive of the hypothesis as were those whose samples were predominantly females (see pp. 103-105). Gender differences and design methodologies are two reasons for which the authors note that the "iso-strain hypothesis of the JDCS model [...] is supported in roughly one-half of the studies" (p. 107). On the other, de Lange, Taris, Kompier, Houtman, and Bongers (2003) noted that finding inconsistencies were due to (but not limited to) the fact that the majority of studies 1) were based on partly the same data set, 2) were cross-sectional (i.e., little research on

the impact of various time lags), and 3) explored normal causal rather than reversed or reciprocal relationships.

In spite of the contradictory findings, Karasek's model and its JDCS variant are useful in that they view control and social support as valued *resources* that help individuals "cope with the environment" (Karasek, 1979, p. 303). While coping emerges from these theoretical traditions as something useful to consider in managing stress, it remains beyond the main scope of this thesis. In fact, the meaning of resources warrants a closer inspection given Hobfoll's (2002) assertion that any understanding of stress mandates an understanding of resources, in particular, resource gains and losses which are issues I discuss in the conceptual development of this work and in its section on future research.

2.2.4. The conservation of resources theory

Hobfoll (1989) introduced a theoretical model that, compared to the prevailing stress frameworks at the time, was allegedly 'better' in its testability, comprehensiveness, and parsimony. His overarching goal was to provide researchers and practitioners a more clear direction for future work on stress, and argued that previous stress theories fell short in bridging "the gap between environmental and cognitive viewpoints" (p. 516). In other words, he believed that previous theories had failed to strike a balance between the contextual features of the environment in which the stressful episode was occurring and the cognitive effort that people were exerting in assessing the stressful stimuli.

The model's basic premise was that individuals seek to preserve, develop, or safeguard valued resources and are they sensitive to and feel stress each time those resources are lost, threatened, or fail to accrue. Thus, this theory provides an explanation for resource gain, maintenance, and loss prevention that enable a person to engage in a host of beneficial behaviors related to the self (e.g., seeking pleasure, health, and success). Specifically, resources are thought to be the sole unit of analysis in understanding stress. They are broadly operationalized as "objects, personal characteristics, conditions, or energies" (p. 516) that are not only valued by a person, but also serve as a means to attain them in the first place; resources therefore are sought in their own right but end up reinforcing each other's development. Hobfoll offered many examples of resources including mastery (Pearlin & Schooler, 1978), self-esteem (Rosenberg, 1965), and socioeconomic status (Worden & Sobel, 1978). While a person's environment may be conducive to fostering resources of all kinds, it may also threaten or deplete them. The potential for resource loss is an aversive feeling for most individuals because resources are instrumental to their goals and, more abstractly, help them define their identity in relation to others – a notion that has been known to psychologists for a long time (see James, 1890).

The conservation of resources model also specifies what individuals actually *do* during periods of stress and non-stress. In the former case, they would seek to reduce the net loss of resources while, in the latter, they would strive to build resource surpluses as a protective strategy against potential future losses. Not surprisingly, then, people experiencing a resource surplus would also likely experience positive wellbeing (and vice versa, i.e., they would feel vulnerable and the negative effects of stress during a resource deficit or in situations where they would be ill-equipped to amass resources).

2.2.5. The effort-reward imbalance model of stress

In an attempt to draw on stress-related knowledge from disparate disciplines for the purpose of developing a more generalizable theory, Siegrist (1996) synthesized material from

multiple psychological traditions (e.g., social, health, organizational psychology), as well as from epidemiology, occupational sociology, psychosomatic and behavioral medicine. Similar to the job demand-control model (Karasek, 1979) and the person-environment fit model (French et al., 1982), Siegrist's goal was to adequately assess the nefarious health implications that arise from stressful experiences at work. However, unlike these traditional models, Siegrist's model tried to shed light on several unresolved issues, one of which was the conceptualization of the term 'control.'

With his effort-reward imbalance model, Siegrist (1996) proposed that life at work could be viewed through the lens of social exchange or reciprocity. More specifically, costs or efforts that are extrinsic (e.g., demands, obligations) and intrinsic (e.g., need for control) were expected to be met with three different types of gains or rewards: money, esteem, and status control. Siegrist (1996) felt that the control one had over his or her status at work was much more potent and likely to override any concerns about task or job control emphasized by Karasek and others. Siegrist's model thus explained that work conditions in which high efforts are met with low-status control, such as few or no promotions, downward mobility, and threats to job continuity undermine the balance between the reciprocity of efforts (costs) and rewards (gains) and, consequently, produce emotional distress that is endemic to stressful work contexts.

2.2.6. The job demands-resources model of stress

It has been said that the simplicity of the job demand-control model and the effort-reward imbalance model is simultaneously a strength and a weakness (De Jonge, Mulder, & Nijhuis, 1999; Van Vegchel, De Jonge, Bakker, & Schaufeli, 2002). While both models are parsimonious and intuitive, they are neither applicable to "the universe of job positions" (Bakker & Demerouti, 2007, p. 311) nor are they flexible in allowing for the integration of other critical factors that have been shown to be associated with wellbeing. To address these limitations, Bakker and Demerouti (2007) fused together into one theoretical model two distinct research areas: job design and work stress. The strength of their framework derives from amalgamating the motivational features of job resources from job design research with the stress of job demands from the occupational stress literature (Dewe & Cooper, 2017). In doing so, Bakker and Demerouti were able to capture more of the intricacies of today's dynamic workplace particularly because they widened the scope of the term 'resources' to include more than merely job control.

Central to their job demands-resources theory is the assumption that every risk factor related to work stress can be categorized in either one of two general groups: job demands or job resources. Bakker and Demerouti (2007) broadened the meaning of job demands to refer to the collective aspects at work that are physical, psychological, social, and/or organizational in nature and that necessitate continued physical (behavioral) and psychological (cognitive, affective) effort. Examples of demands, therefore, include intense job pressure, hazardous work settings, and emotionally taxing interactions with clients or other organizational members. It must be pointed out that job demands need not always be aversive; however, they may metamorphose into potent job stressors if individuals meeting those demands lack the requisite resources (Meijman & Mulder, 1998). Job resources, in turn, also take on a wider significance to encompass any aspect of a job that 1) is instrumental to goal achievement, 2) reduces job demands and the ensuing physiological and psychological costs, and 3) stimulates growth, learning, and personal development. Therefore, the function of a resource is to go beyond simply dealing with job demands and instead to be seen as vital in its own right, which is consistent in

many ways with Hackman and Oldham's (1980) job characteristics theory and Hobfoll's (1989) conservation of resources theory. The general thinking here is that resources matter in and of themselves because they facilitate the achievement, maintenance, and protection of other valued resources. Moreover, resources can be found at numerous levels, such as the organizational level (e.g., pay, promotions), the interpersonal/human relations level (e.g., supervisor and/or coworker support), the work level (e.g., role clarity), and even the task level (e.g., skill variety).

The job demands-resources model also postulates that two psychological processes are at play in the development of stress. The first, labeled the health impairment process, proposes that jobs which are either poorly designed or whose lofty demands are chronic exercise a toll on a person's reservoir of mental and physical resources, thereby leading to resource depletion, exhaustion, and the onset of health problems (for a detailed discussion of the process, see Bakker & Demerouti, 2007, pp. 313-314; see also Hockey, 1993). The second process assumes that job resources have the potential to motivate employees and, consequently, promote high work engagement and performance. This motivational role may be either intrinsic since resources can foster personal growth and self-actualization, or extrinsic because resources also aid in goal achievement (see also Schaufeli & Taris, 2014).

In sum, the job demands-resources model asserts that whereas high job demands and low job resources lead to strain, both high demands and resources lead to greater motivation, such that resources become more valuable as the job becomes more demanding. In addition to these main effects, the model posits that demands and resources jointly interact to produce job strain and work motivation. Specifically, it proffers that resources, the most well-known of which is social support (Haines, Hurlbert, & Zimmer, 1991), may buffer the impact of job demands on job strain, including burnout (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003). Many reasons explain why job resources would act as buffers, yet again this discussion is beyond the purview of this thesis (see p. 315 in Bakker & Demerouti, 2007; see also Schaufeli & Taris, 2014).

Other theories of stress have been proposed since the 1960s, and have contributed to our understanding of work stress and coping. For example, the role stress model by Kahn et al. (1964) is an influential model that focuses on how role expectation and pressure resulting from the interaction of various organizational factors could lead to the experience of role conflict (i.e., incompatible expectations on role bearer), ambiguity (i.e., unpredictability of role bearer's performance), and overload (i.e., too many tasks need to be performed under time restrictions). Beehr and Newman's (1978) facet model focused mainly on the stressor-strain relationship and discussed seven interconnected facets that influence occupational stress including personal (e.g., personality traits and behavioral characteristics), environmental (e.g., job demands and task characteristics), and time (e.g., sequential reactions), among others. Parker and DeCotiis's (1983) organizational model of stress avoids individual differences as moderators of the stressor-stress relationship and outlines how certain stressors (e.g., nature of the work, organizational role, relationships) affect job stress, itself defined as "a particular individual's awareness or feeling of personal dysfunction as a result of perceived conditions or happenings in the work setting" (p. 161). According to the authors, job stress is a first-level outcome that, in turn, influences second-level outcomes including organizational commitment, job satisfaction, avoidance behaviors, and job performance.

As one might correctly assume, a major challenge of stress research is the vast array of proposed models and theories that have been put forward over the last half-century. In an effort to be concise, however, I have focused only on frameworks that have the most utility for the present research.

CHAPTER THREE

3. CONCEPTUAL DEVELOPMENT AND HYPOTHESES

This chapter begins by discussing how stressors are appraised and argues against the commonly held notion that individuals perceive stressors as uniquely challenging or hindering, an assumption that prevails amongst most studies even today. Next, I discuss how harboring different beliefs about the impact that stress has on the self – i.e., on one's stress mindset – will influence people's stress appraisals. I then delve into the various and at times, contradictory, findings on the relationships between stress and work engagement and stress and performance. Considering that these relationships are germane to productivity, I introduce both stress appraisals as a mechanism to better explain them, and stress mindset as a moderator that intends to improve our understanding of the boundary conditions under which they will hold.

3.1. Stress is a Matter of Interpretation: The Role of Appraisals

Until recently, researchers have used a similar approach to Cavanaugh et al. (2000) in differentiating stressors as being either challenges or hindrances but overlooked the possibility that a stressor could be both types simultaneously (e.g., Byron, Peterson, Zhang, & LePine, 2016; LePine, Zhang, Crawford, & Rich, 2016; Rodell & Judge, 2009; Yao et al., 2015). For example, Byron et al. (2016) measured challenge and hindrance stress separately and found that individuals reporting more challenge than hindrance stress showed better performance if they had a promotion-focused approach that is characterized by a stronger focus on gain and accomplishment (Higgins, 2005; Spiegel, Grant-Pillow, & Higgins, 2004). The researchers showed that the opposite occurred for those individuals having a prevention focus which is characterized by a focus on safety and loss avoidance (Higgins, 2005; Spiegel et al., 2004). Among individuals experiencing lower hindrance than challenge stress, prevention focus was positively related to performance and this association became negative at higher hindrance stress levels. This study was among the few that failed to report a significant correlation between the two types of stress (b = .06, ns). In two correlational studies, Yao et al. (2015) employed the same measure used by Cavanaugh et al. (2000) and found that the two dimensions were significantly correlated with both types of stress leading to an increase in emotional exhaustion. LePine et al. (2016) created a measure to capture challenge and hindrance appraisals but, again, neglected to test whether challenge (or hindrance) stressors could lead to hindrance (or challenge) appraisals. Another anomaly in LePine et al.'s (2016) study is the fact that although hindrance appraisals were negatively and significantly correlated with challenge appraisals in Study 1 (b = -.36, p < .05), they were not in Study 2 (b = .03, ns) despite using the same measure, thus raising concerns about the existence of low reliability of the hindrance appraisal measure (α = .70).

This rationale of dichotomizing stressors as unilaterally challenging or hindering originates from the stimulus-response model of stress and the assumption that reactions to stressors are fairly homogeneous across individuals (Brief & George, 1995). As such, stressors that are seen as being under one's voluntary control and that offer the opportunity for personal growth and development are considered to be challenges (e.g., deadlines, cognitively taxing demands, and lengthy work hours). Those, however, that are viewed as less controllable and that obstruct one's goal pursuits are seen as hindrances (e.g., organizational politics, role ambiguity, and job insecurity).

This rigid binary classification is problematic in that it violates the tenets of the transactional theory of stress (Lazarus & Folkman, 1987; Lazarus, 1966, 1991), which holds that both individual and situational characteristics interact in a given stress encounter to influence how much a person appraises the encounter to be *simultaneously* challenging and hindering (see also Crum et al., 2013; Tuckey, Searle, Boyd, Winefield, & Winefield, 2015). In addition, these appraisals are the mechanism by which the stressor leads to immediate or proximal effects (e.g., emotions) as well as more consequential or distal effects (e.g., wellbeing and social functioning) (Lazarus & Folkman, 1987, p. 145). Empirical evidence of such a mechanism was shown recently by Webster, Beehr, and Love (2011) who surveyed a sample of non-teaching university employees and showed that two common challenge stressors (workload and responsibility) and two hindrance stressors (role conflict and ambiguity) are appraised equally as challenging and hindering. In particular, they demonstrated that correlations between a stressor and each of its appraisals could be similar (e.g., the correlations between workload and challenge and hindrance appraisals were .29 and .23, respectively). Later, Gerich (2017) came to a similar conclusion regarding appraisal equivalence, thus suggesting that stressors are not fixed binaries when it comes to how they are appraised. The most obvious reason why individuals evaluate stressors as being both a challenge and a hindrance is the fact that both forms of stress deplete one's energy during the coping process, resulting in an increase in strain (Cohen, 1980; Zhang, LePine, Buckman, & Wei, 2014). Even if the benefits (e.g., increased motivation) associated with challenging stress offset some of the negative influence of strain on work outcomes, it still remains that both types of appraisals are resource depleting and require any given individual to contemplate and resort to various coping mechanisms (Crawford et al., 2010; LePine et al., 2005). Finally, a recent narrative review and meta-analysis by Mazzola and Disselhorst (2019) concluded that the challenge-hindrance model as proposed in its original form failed to garner convincing support partly because it "fails to account for this appraisal process" (p. 951). As such, my first set of hypotheses posit that both types of stressors will be appraised as challenging and hindering:

Hypothesis 1: Challenge stressors are positively related to challenge appraisals.
Hypothesis 2: Challenge stressors are positively related to hindrance appraisals.
Hypothesis 3: Hindrance stressors are positively related to challenge appraisals.
Hypothesis 4: Hindrance stressors are positively related to hindrance appraisals.

3.2. Stress Mindset: A Matter of Difference in the Perception of Stress

Research that explores boundary conditions for the stressor-to-appraisal link is nascent, particularly in the area of organizational behavior. One exception is LePine et al.'s (2016) work in which the authors looked at how a leader's style influences employees' appraisal of various challenge and hindrance stressors, and found that employees of charismatic leaders tend to evaluate challenge stressors as more challenging; charismatic leadership, however, failed to moderate the association between hindrance stressors and hindrance appraisals. Given the importance that the transactional theory of stress places on individual differences, it seems odd, to say the least, that the inclusion of such differences has largely not been taken into account.

An important and overlooked individual difference when it comes to the study of stress, especially in management research, is stress mindset defined as "the extent to which one holds the belief that stress has enhancing consequences for various stress-related outcomes (referred to as a stress-is-enhancing mindset) or holds the belief that stress has debilitating consequences for

those outcomes (referred to as a stress-is-debilitating mindset)" (Crum et al., 2013, p. 716). Unlike appraisals which are evaluations of the valence and intensity of the experienced stress at particular moments and contexts, stress mindset is a meta-cognitive belief about the nature and the outcomes of stress in general (Crum et al., 2017). There is now a body of psychological research on the beneficial effects of having a positive stress mindset during stressful episodes (Crum et al., 2013, 2017; Duckworth, 2016). For instance, compared to individuals possessing a negative stress mindset, those having a positive one showed improved affectivity and cognitive ability and flexibility when placed in stressful situations that were seen as challenging rather than threatening (Crum et al., 2017). However, as a construct, stress mindset has been scarcely used to study challenge and hindrance stressors and their associated appraisals. This, in spite of its reputation of having a "significant impact on the manner in which stress is behaviorally approached as well as the manner in which stress is psychologically experienced" (Crum et al., 2013, p. 718).

Individuals possessing a stress-is-enhancing or positive stress mindset are more motivated to approach a stressor since they believe it to have enhancing outcomes. These individuals are more likely to exhibit moderate increases in the stress hormone cortisol and an approach-oriented mentality and behavioral tendencies when faced with stressors (Crum et al., 2013, 2017; Jamieson et al., 2018). Perceptual selectivity, a higher level of optimism, and an affinity toward positive affect ought to make these individuals more likely to not only anticipate the existence of challenge-inducing characteristics in a certain stressor, but also overemphasize these characteristics when they are present. On the other hand, individuals having a stress-is-debilitating or negative stress mindset are more likely to show greater fluctuations in cortisol and are more likely to face stressors with an avoidance-oriented approach and a higher affinity towards negative affect and pessimism (Crum et al., 2013, 2017; Jamieson et al., 2018). These individuals are more likely to obsess about the minutiae of the hindering and uncontrollable characteristics of the encountered stressor irrespective of how it is categorized in the literature. Hence, my second set of hypotheses predict that:

Hypothesis 5: Stress mindset will moderate the positive relationship between challenge stressors and challenge appraisals such that, for individuals with a more positive mindset, the relationship will be stronger than for individuals with a less positive mindset.

Hypothesis 6: Stress mindset will moderate the positive relationship between challenge stressors and hindrance appraisals such that for individuals with a more positive mindset, the relationship will be weaker than for individuals with a less positive mindset.

Hypothesis 7: Stress mindset will moderate the positive relationship between hindrance stressors and challenge appraisals such that for individuals with a more positive mindset, the relationship will be stronger than for individuals with a less positive mindset.

Hypothesis 8: Stress mindset will moderate the positive relationship between hindrance stressors and hindrance appraisals such that for individuals with a more positive mindset, the relationship will be weaker than for individuals with a less positive mindset.

As discussed, much of the research over the last half-century has portrayed employee stress in a negative light without considering its potentially positive effects. For example, Bakker and Demerouti (2007) have noted that the majority of studies have focused on negative outcomes, such as burnout, illness, and repetitive strain. This lopsided focus on mental illness

rather than wellness or flourishing has spurred organizational psychologists to shift their attention on work engagement (Bakker, Schaufeli, Leiter, & Taris, 2008), an effort that coincided with the surge of interest in positive work psychology and wellbeing (Danna & Griffin, 1999; Seligman & Csikszentmihalyi, 2000). Next, I discuss the relationships between stressors, appraisals, and work engagement, and discuss whether stress mindset could also be valuable in explaining them.

3.3. Stress and Work Engagement: A Relationship Revisited with Appraisals

Kahn (1990) first defined work engagement as an individual's full dedication into a role in which there is a physical, cognitive, and emotional investment throughout the task's duration. Maslach and Leiter (1997) later conceptualized engagement as the opposite of burnout. As such, they characterized it with high energy levels rather than emotional and physical exhaustion, involvement rather than cynicism, and efficacy rather than diminished personal accomplishment. Schaufeli, Salanova, González-Romá, and Bakker (2002), on the other hand, considered work engagement to be an independent concept albeit one that remained negatively related to burnout, and defined it as a "positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (p. 74). Vigor represents high energy, mental grit, and the desire to invest large amounts of effort during a work-related task. Dedication, on the other hand, corresponds to a feeling of importance and pride when one is confronted by the challenges of the work. Finally, absorption is the act of concentrating deeply on one's work, being completely immersed in it to the point at which time passes unnoticeably (see also González-Romá, Schaufeli, Bakker, & Lloret, 2006). Thus, whereas work engagement is associated with elevated energy and a strong identification with one's work, burnout is characterized by depleted energy and poor work identification. Consequently, organizations whose employees report being engaged have benefitted from several positive outcomes including higher shareholder returns, profitability and productivity, and lower turnover and absenteeism to name a few (see meta-analysis by Crawford et al., 2010). Although scholars have been divided on the meaning of engagement and whether it is a new name for an existing construct (Macey & Schneider, 2008), studies have shown that it is, in fact, distinct from other seemingly related constructs like job satisfaction, job involvement, intrinsic motivation, task performance, and citizenship behavior (Rich, LePine, & Crawford, 2010).

In the majority of empirical studies on work engagement, researchers have grounded their explanations using the job demands-resources theoretical model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), which posits that job demands lead to burnout via a process that depletes one's energy, whereas resources promote engagement by eliciting one's motivation. Demands including workload, time pressure, and hazardous physical job settings comprise aspects of the job that require continued physical and/or cognitive effort and are linked to various psychological costs such as mental strain. Resources refer to job aspects that stimulate personal growth and are deemed instrumental in achieving work goals. Resources also help decrease aversive psychological and physiological costs associated with job demands and examples include job control, participation in decision making, task variety, feedback, and social support.

Despite the model's parsimony and its ability to predict that job demands contribute to the onset of burnout, evidence over the years from studies on the relationship between demands and engagement has been ambiguous and, as a result, scholars have concluded that demands alone – without considering *types* of demands – are problematic for predicting engagement (Crawford et al., 2010). Unlike the positive relationship found consistently between job demands

and burnout, the relationship between demands and work engagement has produced contradictory findings. For example, using four different samples, Schaufeli and Bakker (2004) found that demands conceptualized as a combination of workload and emotional demands did not adequately predict work engagement. In another study, Bakker, van Emmerik, Geurts, and Demerouti (2008) observed that the relationship between job demands and work engagement was moderated by the amount of time lapse needed away from the job to restore one's vitality, known as 'recovery time.' In other words, given enough off-the-job recovery time, individuals' work engagement became positively related to job demands. The authors hypothesized that, under recovery conditions, demands typically seen as stressors could also act as challenges that energize employees. Paradoxically, however, they found no support for the expected negative relationship between job demands and engagement when recovery time was low. Crawford and colleagues (2010) argued convincingly that such inconsistencies could be resolved if demands were to be differentiated into either challenges or hindrances, and found that the meta-analytic correlation between overall or undifferentiated job demands and work engagement was negative. In spite of this, the effect size was very small, and the confidence intervals nearly included zero (ρ = -.08, *C.I.* [-.13, -.03]). After dichotomizing demands into challenge and hindrance demands, the effect sizes improved considerably and the confidence intervals around these effects was much better; challenge demands were positively related to work engagement (ρ = .16, *C.I.* [.11, .21]), while hindrance demands were negatively associated with engagement (ρ = -.19, *C.I.* [-.23, -.16]). Mazzola and Disselhorst (2019) meta-analyzed only three papers that are guided by the challenge and hindrance model of stress, and found that challenge and hindrance stressors are positively (r = .09) and negatively (r = -.11) correlated with engagement, respectively. These correlations, however, were nonsignificant. The small number of studies included in this meta-analysis makes it difficult to properly judge the findings' validity. In addition, the authors failed to consider research that studied the relationships between various challenge and hindrance dimensions and work engagement. I discuss these findings next.

3.4. Additional Evidence for the Relationship between Stressors and Work Engagement

A similar pattern is witnessed when examining the relationships between specific types of challenge and hindrance demands and work engagement (for details see Table 2 in Crawford et al., 2010, p. 842). A more recent meta-analytic study investigated the same relationships within the job demands-resources model and found corroborating results, with challenge and hindrance stressors being positively and negatively related to work engagement, respectively (Goering, Shimazu, Zhou, Wada, & Sakai, 2017). Moreover, using improved methodological approaches such as meta-analytic structural equation modeling, Goering and colleagues (2017) concluded that engagement and burnout are distinct entities (i.e., they are not opposite or antipodal) that differentially predict a host of behavioral and attitudinal outcomes, thereby substantiating the 'distinct states' view in which burnout and engagement possess different nomological networks (Schaufeli & Bakker, 2004).

Correlational studies differentiating between challenge and hindrance stressors have shown similar findings as well. For instance, using two large yet diverse samples of call agents (N = 261) and police officers (N = 441), Van den Broeck, De Cuyper, De Witte, and Vansteenkiste (2010) found that hindrance stressors, operationalized as emotional demands and work-home interferences, were negatively related to vigor. On the other hand, vigor was positively related to challenge stressors (e.g., workload and cognitive demands). Using the three-dimensional framework of work engagement and two diverse samples of secondary school

teachers ($N = 460$) and users of information and communication technology ($N = 596$), Ventura and colleagues (2015) found that engagement was positively related to challenge and negatively related to hindrance demands.

Longitudinal studies looking at the stress-work engagement linkage and using the challenge-hindrance dichotomy approach are few in between. In one such study, Bakker and Sanz-Vergel (2013) sampled a group of nurses and found that the positive relationship between personal resources and engagement was moderated by emotional demands, a challenge stressor in this particular work setting. Personal resources led to improved engagement only when this challenge stressor was high. Work pressure was considered to be a hindrance stressor in this context and played no role in the resources-engagement relationship. Karatepe, Yavas, Babakus, and Deitz (2018) used a time-lagged design to survey frontline hotel employees about the effects of management's commitment to service quality on challenge and hindrance stress and, subsequently, engagement. They found that hindrance stress negatively influenced engagement but the hypothesized positive relationship between challenge stress and engagement was nonsignificant.

In a diary study of primary school teachers, Tadić et al. (2015) tested the moderating role of job resources on challenge and hindrance stressors' effects on work engagement. Similar to Bakker and Sanz-Vergel's findings (2013), they found a significant interaction between challenge stressors (e.g., workload, time urgency) and job resources, with challenges leading to higher engagement levels whenever more resources were prevalent compared to fewer resources. However, in this case, job resources buffered a negative relationship between hindrance stressors (e.g., role ambiguity, role conflict) and work engagement. In a more recent diary study, again drawing from a sample of secondary school teachers, Tadić, Oerlemans, and Bakker (2017) found that autonomous motivation was an indirect path by which hindrance stress negatively influenced work engagement. They also found initial support for a positive indirect effect of challenge stress on work engagement through autonomous motivation, even though it failed to achieve significance ($p < .10$). In research involving employees across occupational domains, Baethge, Vahle-Hinz, Schulte-Braucks, and van Dick (2018) studied both within- and between-person effects of time pressure on work engagement in a diary study using intervals of five days and three weeks, respectively (Study 1), and a panel study spanning six to eight weeks (Study 2). The authors found that the temporal nature of stress affected the extent to which employees evaluated the stress as either a challenge or a hindrance. More specifically, work engagement increased when time pressure was short in duration (i.e., up to one week); when exposure to time pressure endured over a lengthy period (i.e., six weeks or more), engagement suffered. Hence, whereas short bursts of time pressure acted as challenge stressors, longer ones were evaluated as hindrance stressors. Other recent longitudinal research focused on the motivational mechanisms by which challenge and hindrance stressors differentially affect work engagement. Kim and Beehr (2018) collected data from full-time US employees at two separate time points, two weeks apart. Using the job demands-resources theory of stress, they argued that psychological empowerment and organization-based self-esteem (OBSE) are two forms of intrinsic motivation that represent personal resources enabling employees to effectively control and influence their work environments. The authors found, not surprisingly, that workload (a challenge stressor) was positively related to engagement through a positive effect on both empowerment and OBSE, while role conflict, role ambiguity, and interpersonal conflict (i.e., hindrance stressors), showed opposite relationships with engagement through both mediators.

The current state of knowledge regarding the association between work stressors and work engagement suffers from several important gaps. First, few empirical studies were designed to measure the differential effects of challenge and hindrance stress on engagement. As already mentioned, Mazzola and Disselhorst (2019), for example, found only three studies testing all of the dimensions of challenge and hindrance stress advocated by Cavanaugh and colleagues (2000). Most studies consolidated or "lumped together" demands into one category (Cole, Walter, Bedeian, & O'Boyle, 2012, p. 1574). This consolidation of demands is troublesome given that differentiating them might be critical in explaining the demands-engagement relationship as purported by other organizational scholars (Crawford et al., 2010). The lack of such studies is evident not only in the review presented above but also in the demonstrable lack of comprehensive meta-analyses on the topic (for a critique, see Goering et al., 2017). As a result of this dearth of studies, and considering the scientific community's recent plea for replication in the social sciences (Open Science Collaboration, 2015), there appears to be an unequivocal need for empirical studies investigating the promising relationships between the differentiated types of job demands utilizing the challenge-hindrance model of stress and work engagement.

Second, although there is some indication that a modicum of the work cited above was guided by the process-oriented transactional theory of stress, few studies currently exist which measure stress appraisals as a means of predicting work-related outcomes. Following one extensive search, one meta-analytic study (Crawford et al., 2010) was believed to be an exception but to no avail. In their paper, the authors claimed that the job demands-resources model failed to account for how employees appraise different types of demands (i.e., challenges or hindrances), and this shortcoming was largely responsible for the ambiguous relationships found between job demands and engagement. However, when testing their model, the authors made no provisions for including appraisals as separate entities from the demand types themselves. Mazzola and Disselhorst, (2019) also looked at the challenge-hindrance link to engagement, but their meta-analysis again failed to include any appraisals. To their credit, the authors did argue for the need to move toward a more appraisal-based treatment.

As such, challenge appraisals pose evaluations of obstacles that could nevertheless be surmounted and toward which employees can use an active problem-based coping style that is characterized by increased effort and strategic thinking rather than an emotional-based one (Crawford et al., 2010). Stressors evaluated as challenges have been shown to improve thriving, positive affect (e.g., eagerness and excitement) and approach motivation, in addition to cognitive performance and flexibility (Crum, Akinola, Martin, & Fath, 2017; Kassam, Koslov, & Mendes, 2009). Challenges, being growth inducing and more controllable than hindrances, also facilitate goal achievement by offering opportunities to satisfy the needs of achievement and power and, ultimately, contribute to health and wellbeing. Since work engagement is at its core a "persistent and pervasive affective-cognitive state" (Schaufeli et al., 2002, p. 74), the benefits to positive affectivity and cognitive performance and flexibility brought on by challenges should reflect increased engagement. In contrast, hindrance appraisals represent hostile constraints on employees who, in turn, might rely on emotion-based coping such as dissociation and withdrawal. Hindrances also frustrate the satisfaction of basic needs like competence, autonomy, and relatedness and, consequently, impede the achievement of employee goals (Gagné & Deci, 2005). Moreover, they are negatively associated with health and wellbeing and have been linked to deteriorations in cognitive ability and increases in negative affect (e.g., fear, anxiety) (Crum et al., 2017; Kahn, 1990; Kassam et al., 2009). Given this line of reasoning, and the fact that this type of stress is known to stunt growth potential and goal achievement, individuals are less likely

to be invested in the job which will lead to reduced engagement (Bakker & Heuven, 2006; Demerouti, Taris, & Bakker, 2007). Therefore, following this rationale and the findings already discussed on the relationship between the two kinds of stress *appraisals* and work engagement, I posit that:

Hypothesis 9: Challenge appraisals are positively related to work engagement.
Hypothesis 10: Hindrance appraisals are negatively related to work engagement.

3.5. Not Everyone is Equally Engaged: The Role of Stress Mindset

Of the studies designed to explore the differential effects of challenge and hindrance stress appraisals on employees' work engagement, few to my knowledge have accounted for the impact of employee individual differences. A recent exception involves the work of Mitchell and colleagues (2019) who employed an experience sampling methodology to investigate the effect of performance pressure – the urgency to achieve high performance levels that are tied to beneficial rewards – on two types of appraisals (challenges and threats) which, in turn, influence a host of outcomes like engagement, incivility, and citizenship behaviors. Relying on Lazarus's (1966) transactional theory of stress, the authors argued that trait resilience, i.e., hardiness enabling individuals from withstanding and bouncing back from hardship, would be deemed an important individual difference in the study of performance-based stress. In particular, they accurately predicted that the positive indirect effect of performance pressure on engagement through challenge appraisal would be stronger at higher (rather than lower) trait resilience. However, similar to Crum and her colleagues (2017), the authors equated threats with hindrances. This is surprisingly inaccurate since the research drew heavily on the transactional theory of stress which clearly differentiates the two as being dissimilar entities (Lazarus, 1991; see detailed discussion in Tuckey et al., 2015).

In my estimation, aside from this recent exceptional case, this dearth in scholarly activity on individual differences constitutes a tertiary gap in the literature. Since work engagement involves both emotional and cognitive dimensions, individual differences become critical in any study, particularly one focused on stress. At first glance, an exception seemed to be the work of Crum et al. (2017). The authors manipulated participants' evaluation of a mock job interview by giving positive (the 'challenge' evaluation condition) and negative feedback (the 'threat' condition). They also manipulated individuals' stress mindset by showing them video clips depicting either the enhancing or debilitating consequences of stress. The authors found that challenge evaluations combined with a positive mindset resulted in improved positive affect and cognitive ability compared to the other conditions. This one study stands out in its novel approach of integrating stress mindsets and stress appraisals, something that remains in its infancy in organizational research yet promises to gain momentum in the coming years (see reviews by Jamieson et al., 2018; Mazzola & Disselhorst, 2019).

In spite of this progress, Crum et al.'s (2017) study is not without its limitations when it comes to properly addressing the challenge-hindrance stress model. One such limitation involves the way in which the researchers manipulated the participants' experience so they would evaluate the stressful situation as either a challenge or threat. Threats and hindrances are not synonymous terms or interchangeable constructs and are hypothesized to be different appraisals altogether (Lazarus, 1991). Tuckey and colleagues (2015) offered empirical proof that hindrances and threats are separate constructs, with hindrances representing "obstacles to growth and accomplishment" and threats being "work-related demands or circumstances that tend to be

directly associated with personal harm or loss" (p. 7). While their manipulation included negative and positive feedback on participants' interview performance, they failed to investigate the effects of perceived hindrance stress. Also, as the authors aptly noted, their stress manipulation represented a form of acute short-term stress. Hence, they did not monitor the effects of stress beyond the study's duration of 90 minutes. Furthermore, their study does not allow for causality claims to be made since it lacked pre-manipulation measures of the outcome variables.

In this thesis, I attempt to resolve these issues in a twofold manner. First, by employing a measure of appraisals that concurs with the definitions of challenge and hindrance stress according to Lazarus's (1991) transactional theory of stress and, second, by gathering longitudinal data about a full typical work week from full-time employees about more prevalent chronic stressors at work.

When it comes to work engagement, my belief is that individuals having varying stress mindsets should experience work engagement differently following a stressful period. Macey and Schneider (2008) discussed how some work characteristics can have a positive influence on work engagement. They stipulated that challenging work is more inducing of work engagement than painless or undemanding work, a theme found across a plethora of motivation theories. Both goal-setting theory (Locke, 1968) and the Job Characteristics Model (Hackman & Oldham, 1980) discuss how challenging but achievable goals that require the use of a variety of skills – and that give employees a sense of significance and autonomy – can result in an increase in intrinsic motivation which is critical for work engagement. Employees with a stress-is-enhancing or positive stress mindset are more likely to evaluate stressors as being more challenging and less hindering and are thus more likely to react to these challenging stress appraisals by demonstrating vigor, dedication, and absorption at work. These individuals are both more willing and motivated to spend energy and other resources at work because they expect that rewards will follow. Furthermore, those same individuals that 'see opportunities' when faced with stressors are more emotionally and cognitively motivated by challenge appraisals, benefit more from handling these stressors, notice and appreciate the growth and control potential in the stressors appraised, and are more likely to be engaged at work (Britt, Aldler, & Bartone, 2001; Crum et al., 2017).

Another rationale for this relationship comes from work on personal resources and how they fit within the Job Demands-Resources model of stress which focuses largely on job resources (Bakker & Demerouti, 2007). Personal resources are defined as "the psychological characteristics or aspects of the self that are generally associated with resiliency and that refer to the ability to control and impact one's environment successfully" (Schaufeli & Taris, 2014, p. 49). The literature has integrated personal resources into the job demands-resources model in various ways (for a detailed discussion see Schaufeli & Taris, 2014), and such resources include optimism, self-efficacy, and self-esteem among others (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007).

Given this rather broad operationalization, one can reasonably include stress mindset as a personal resource in the pantheon of dispositional constructs essential to the study of stress (e.g., like the Big Five). Individuals that have a stress-is-enhancing mindset are more optimistic when faced with stress and more likely to perceive opportunities for achievement, growth, and control compared with those having a stress-is-debilitating mindset. The boosting hypothesis (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Bakker, van Veldhoven, & Xanthopoulou, 2010) claims that resources are especially relevant under stressful job conditions and describes that

high demands coupled with high resources should jointly predict a surge in engagement whenever individuals appraising the stress as challenging have a more positive, than negative, stress mindset. As such, I hypothesize that:

Hypothesis 11: Stress mindset will strengthen the positive relationship between challenge appraisals and work engagement, such that individuals with a more positive stress mindset will experience a higher level of work engagement than those with a less positive stress mindset.

Contrary to challenge appraisals, hindrance appraisals indicate an evaluation on behalf of the individual that the situation is uncontrollable and that opportunities for growth and advancement are lacking. Again, based on a careful reading of the literature, my sense is that stress mindset is essential in understanding the previously hypothesized negative link between hindrance appraisals and work engagement. According to goal-setting theory (Locke, 1968), people are more intrinsically motivated if they are committed to, and have a sense of relatedness with, the desired goal. Organizations can achieve commitment by including employees in the decision-making process and by selecting goals that fit employees' abilities and expectations. The Job Characteristics Model (Hackman & Oldham, 1980) emphasizes how meaningfulness at work is a key psychological component in achieving commitment and motivation. The less a given stressor is evaluated as a hindrance, the more likely that employees will become engaged at work.

I have already hypothesized that a positive stress mindset assists in reducing the hindrance appraisals attributed to stressors. Therefore, this type of mindset should also reduce the hypothesized negative effects of these appraisals on work engagement. Unlike pragmatic individuals whose positive stress mindsets enable them to perceive a stressor's rewarding features, those with negative stress mindsets ought to also experience less engagement because they ruminate about aspects of the hindrance stressor that block goal attainment (Crum et al., 2017). Individuals with a negative stress mindset are more sensitive to the lack of control and the low probability of achievement associated with hindrance appraisals hence reducing their vigor, dedication, and absorption. The stress-is-debilitating mindset has also been associated with lower cognitive ability and flexibility and increased negative affect (Crum et al., 2017; Jamieson et al., 2018), all of which should make the adverse effect of hindrance appraisals on work engagement more pronounced. A meta-analysis by Harter, Schmidt, and Hayes (2002) revealed that work engagement is more likely to surface when individuals are both emotionally and cognitively engaged and that obstacles such as role and task ambiguity will hinder both types of engagement and overall work engagement as a result. Again, by viewing stress mindset as a personal resource, one may be guided by the buffering hypothesis of the job demands-resources model – i.e., the opposite counterpart to the boosting hypothesis – which suggests that resources lessen the negative effects that high demands have on engagement and lessen the positive effects that high demands have on burnout (Schaufeli & Taris, 2014). A positive stress mindset should thus be valuable in mitigating the predicted negative effect of hindrance appraisals on work engagement. Based on this rationale, I posit that:

Hypothesis 12: Stress mindset will weaken the negative relationship between hindrance appraisals and work engagement, such that individuals with a more positive stress mindset will experience a higher level of work engagement than those with a less positive stress mindset.

An in-depth exploration of the current literature shows that only a few studies have measured appraisals and tested them as a mechanism or conduit through which stressors affect business-related outcomes. Scholars investigating such a mechanism have found that when appraisals are taken into consideration, the effect of the stressor on the outcome is greatly diminished and becomes nonsignificant at times. For example, Gerich (2017) showed that, across many work conditions, the relationship between various work stressors and health outcomes became nonsignificant after introducing challenge and hindrance appraisals into the model (see also Prem, Ohly, Kubicek, & Korunka, 2017; Searle & Auton, 2015). Collectively, these findings propose that a good portion of the variance in stressors (influencing a myriad of outcomes) is carried through appraisals. Appraisals thus appear to be a key mediator in the stress-to-outcome link.:

Hypothesis 13: Challenge appraisals will mediate the relationship between challenge stressors and work engagement.
Hypothesis 14: Challenge appraisals will mediate the relationship between hindrance stressors and work engagement.
Hypothesis 15: Hindrance appraisals will mediate the relationship between hindrance stressors and work engagement.
Hypothesis 16: Hindrance appraisals will mediate the relationship between challenge stressors and work engagement.

This thesis began by chronicling the major theories on stress and revisiting the relationship between stressors and engagement. Next, I turn to the relationship between stressors and in-role performance by focusing on how appraisals also influence this important link.

3.6. Stress, Appraisals, and In-Role Performance

Performance has a rich history in organizational behavior, often considered one of the most far-reaching variables in the field. Much of the occupational stress research that has investigated the effect of stressors on job performance measured in-role performance using supervisory ratings (Jex, 1998) as this type of performance is directly related to the organization's core processes (Borman & Motowidlo, 1993). The effect of stress on job performance has been the subject of extensive scholarly debate, with studies variously suggesting negative, positive, curvilinear, and null relationships (see Jamal, 2007; Muse et al., 2003). Whereas laboratory studies have revealed that stressors negatively influence performance because they hinder cognitive functioning, field studies have been less conclusive (Jex, 1998; Sonnentag & Frese, 2003). Some field studies have replicated findings of the negative relationship between job stress and job performance among corporate employees in collectivistic non-Western societies. For example, Jamal (2007) found that overall job stress – in addition to four stressors consisting of work overload, ambiguity, conflict, and resource inadequacy – were negatively related to job performance among Malaysian and Pakistani workers, thereby providing some evidence of cross-cultural generalizability of findings (for studies showing a

similar negative stress-performance association in individualistic Western contexts, see Jamal, 1984, 1985).

Growing research has also been devoted to the positive effects that result whenever workers are placed under demanding stressful conditions (Britt & Jex, 2015; Nelson & Simmons, 2011). For example, Wallace, Edwards, Arnold, Frazier, and Finch (2009) showed that greater levels of stressors that challenged employees were associated with better performance ratings by supervisors, particularly among those workers who believed they were supported by the organization; when employees perceived no organizational support, challenging work demands were unrelated to performance evaluations. Authors reporting such positive stress-performance relationships, however, have been careful to confess that "discussing the positive outcomes that may result from stressful work does not discount the negative effects these stressors may have" (Britt & Jex, 2015, p. 135).

Nevertheless, such contradictory findings with weak-to-moderate negative relationships between stress and job performance (and positive ones between stress and negative work outcomes) became some of the main catalysts for further research on the dimensionality of stress (Cavanaugh et al., 2000). Wallace and colleagues (2009) examined the effects of challenge and hindrance stressors on role-based performance, a construct they operationalized collectively as task performance, customer service performance, and citizenship behaviors. In a specific field context involving the department of motor vehicles after Hurricane Katrina in the southern United States, the authors found support for both positive challenge stressor-performance and negative hindrance stressor-performance relationships. In another study surveying alumni from a Midwestern US university employed in various white-collar professions, and using the Cavanaugh et al. (2000) stress measure, Webster, Beehr, and Christiansen (2010) found that hindrance stress negatively influenced performance through physical symptoms, whereas they did not observe the expected positive influence of challenge stress on performance through work self-efficacy. Meta-analytic studies have also analyzed this relationship. LePine and colleagues (2005) found weak positive and negative correlations between performance and challenge and hindrance stressors, respectively. However, they contrived the challenge-hindrance distinction since the primary sources for the meta-analysis rarely included measures of the two stressors. Mazzola and Disselhorst (2019) meta-analyzed five studies and found a negative correlation between hindrance stressors and performance (r = -.22), as well as a nonsignificant relation between challenge stressors and performance. Although a good first step, the studies included only other-reported measures of performance (i.e., not self-reports) and the meager number of studies included again makes the validity of the results questionable.

Also recently, Zhang et al. (2014) looked at the stressor-performance relationship under different leadership styles and found that transformational leadership enhanced the positive effect of challenge stressors on performance while transactional leadership buffered that between hindrance stressors and performance. Lin, Ma, Wang, and Wang (2015) drew from a sample of Chinese employees to study stressor impact on supervisory ratings of performance and showed that challenge stress positively affected performance for highly conscientious individuals but negatively affected performance for those low on conscientiousness. This singular personality trait, however, did not appear to moderate the negative hindrance stress-performance link. Abbas and Raja (2019) used a Pakistani sample in a very similar study that analyzed the effects of challenge and hindrance stressors on performance while taking into account conscientiousness as a moderator. Highly conscientious people performed better than less conscientious ones exposed to challenge and hindrance stressors, with the interaction of conscientiousness and challenge

stress being partially significant. However, these conscientious individuals were more likely to think about leaving the organization when faced with increasing challenge stressors. Low conscientious workers actually performed better when faced with challenge stressors compared to hindrance stressors. Unlike Li et al. (2015), these authors did not find a significant direct positive relationship between challenge stressors and performance (b = -.04, ns) nor did they find a significant negative relationship between hindrance stressors and performance (b = -.01, ns). In both cases the effect sizes presented were very small. The researchers attributed some of these conflicting findings to the dissimilar cultural background of participants in both studies. Lin and Ling (2018) followed a sample of Chinese tourism workers to study the effects of role overload (a challenge stressor) and role ambiguity (a hindrance stressor) and found that while role ambiguity negatively affected service quality, role overload had no positive relationship with quality. Last, a recent meta-analytic study found that the correlations between challenge and hindrance demands and task performance were positive (b = .15, p < .05) and negative (b = -.15, p < .05), respectively (Goering et al., 2017).

Together, these findings suggest that the stressor-performance link does not reside in any one particular research stream and that it is up to scholars to decide how to explore it. While some may wish to delve into a specific situational context, others may be more inclined to focus on individual differences acting as boundary conditions in producing a given effect.

A gap pervading the scholarship which explores the stress-performance link is not only the timid reference to the challenge-hindrance model of stress and the limited use of the different stressors, but also the blatant absence of stress appraisals. Although Crawford et al. (2010) discussed at length the importance of appraisals, they did not measure them in their meta-analysis due to a lack of empirical findings. The same problem persists in the Mazzola and Disselhorst (2019) meta-analysis. Another such example rests with Webster et al. (2010), who state that "the appraisal process is thought to be at the heart of the hindrance-challenge distinction" (p. 70) but who also failed to assess it. Even meta-analyses that hone on the issue of stress and performance neglected to consider appraisals. For example, Gilboa, Shirom, Fried, and Cooper (2008) meta-analyzed 169 studies dealing with the relationship between work demands and performance and, despite mentioning that appraisals represent a mechanism underlying the phenomenon and that they are "not mutually exclusive and can occur simultaneously" (p. 230), they analyzed studies that mostly measured stressors rather than appraisals. The authors concluded by stating that "enhancing our understanding of the process of stress appraisal as combining and integrating challenge and hindrance appraisals would enable a more valid testing and a better understanding of the effect of a stressor on performance" (p. 255).

Despite these pleas for increased attention on appraisals, few researchers have looked at stressor appraisals in relation to job performance. González-Morales and Neves (2015) investigated the mediating roles of affective commitment and psychosomatic stress in the connection between challenge appraisals and both in- and extra-role performance. In crafting their argument, they hypothesized that challenge stressors could be appraised as either threats or opportunities. While affective commitment was found to be a mediator connecting challenge appraisals to performance, psychosomatic stress mediated only the effect of threat appraisals, not opportunities, on performance.

As with all research, this study was also fraught with its share of limitations. First, the authors made no use of hindrance stressor measures, justifying this oversight with the rationale that the association between hindrance stressors and performance was already established. A diligent review of the literature, as presented above, shows otherwise. In addition, this reasoning

does not take into account one of the most robust findings in the stress appraisal literature and a central point of this thesis, namely that hindrance stressors can sometimes be appraised equally as both challenges and hindrances. Second, the authors failed to consider salient individual differences when it came to the appraisal–performance relationship. This may be one reason explaining the conflicting findings. We have already seen how weak-to-nonexistent relations with stress could be witnessed when differences in the nature of the stressor are considered (e.g., Crawford et al., 2010). Therefore, one must take into consideration individual differences that might influence how stressors are appraised because appraisals are more proximal to stress outcomes than the stressors themselves (Lazarus, 1999). Individual differences should also be instrumental in how these appraisals get translated to stress responses. Preliminary work in the area of stress interventions has shown that changes in mindset can interact with stress evaluations to predict various outcomes (Crum et al., 2017). Reviews on the topic have called for the empirical testing of models that integrate mindset theories and the more implicit theories of stress appraisals (see Jamieson et al., 2018). Third, the segregation of challenge appraisals into opportunities and threats, though logical, needs further empirical justification given the need for various sampling and research design choices, in addition to the fact that the transactional theory of stress includes challenge, threat, and benefit appraisals as representing distinct constructs (Lazarus, 1991).

In all, given the scant literature on the relationship between challenge and hindrance stressors and performance and the paucity of scholarly activity on the role of appraisals, much value is to be derived from choosing job performance as a second outcome variable. Here, I focus on in-role performance and exclude extra-role performance (e.g., OCB) for brevity. However, from a broader philosophical perspective, although extra-role behaviors do impact individual outcomes in addition to organizational outcomes, their in-role counterparts are believed to be the more impactful of the two (Borman & Motowidlo, 1993; Jex, 1998). Another reason for this choice is that I wanted to use and measure a performance variable, i.e., in-role performance, similar to ones reported routinely in published research for the purpose of comparing findings given improvements, both methodologically and theoretically, made here.

Several frameworks have been alluded to in studying the stress-to-performance link. For example, fairness theory (Folger & Cropanzano, 2001) focuses on the assignment of blame and accountability and includes three main components: 1) the existence of injurious conditions, 2) the attribution of such conditions to another's behavior, and 3) the judgment that such a situation represents a violation of a moral principle (see p. 3). Since work demands are the "basis for the exchange relationship between the employee and the organization" (Zhang et al., 2014, p. 679), fusing fairness theory with Blau's (1964) social exchange theory could help explain the differential effects of both types of appraisals on performance. In situations where stressors are appraised as challenges, individuals interpret such situations as being controllable and, as such, ripe for growth and achievement (Cavanaugh et al., 2000; Lazarus & Folkman, 1984). While appraisals are strain-inducing irrespective of how a stressor is evaluated (i.e., as hindrance or challenge), challenge appraisals render the exchange as being 'fair' because any expenditure of energy and resources in handling the stressful situation is expected to lead to goal attainment, growth, control, and an overall positive return on investment. This sense of fairness will prompt employees to reciprocate their organization's goodwill by means of increased effort and performance. On the other hand, hindrance stressors are associated with a lack of control and little-to-no potential for growth or advancement. Faced with such a predicament, employees will come to perceive any resource expenditure as being 'unfair' since the exchange fails to provide

them with benefits that outweigh or, at the very least, cover the costs incurred in handling the stressful situation. According to Locke's range of affect theory (1976), this discrepancy between desired outcomes and ones that are perceived to be received results in lower job satisfaction and lower work performance.

Researchers have also relied on motivational theories to justify how different stressors affect performance. Perhaps one of the most cited works on this endeavor is that by LePine and colleagues (2005). Using Vroom's (1964) expectancy theory, the authors argued that individuals who appraise stressors as challenges are more likely to expect that they will be able to overcome them. Consequently, their expectancy rises. However, since hindrance appraisals are generally associated with uncontrollable stressors that dissuade goal attainment, expectancy in this situation should be much lower. In addition, since the outcomes expected from overcoming challenge stress are believed to be growth inducing and positive, individuals tend to evaluate the valence of those outcomes more favorably compared to those who appraise stressors as hindrances. Lastly, a main differentiating aspect between challenge and hindrance stress is that challenges are associated with the belief that one will benefit from overcoming an encountered stressor, whereas this is not the case with hindrances which are typically not associated with any positive outlook. As such, the probability of receiving advantageous returns (e.g., professional growth) in the hindrance case is low. This implies that challenge appraisals should also be associated with higher levels of instrumentality toward wanted outcomes than hindrance appraisals, with instrumentality representing the degree to which an employee believes that performing at level *X* will bring with it the achievement of outcome *Y* (Vroom, 1964).

The above arguments suggest that challenge stress appraisals will lead to a higher level of motivation than hindrance appraisals and, thus, to a higher level of performance. A similar conclusion could be reached if one was guided instead by the self-determination theory (SDT) of motivation (Gagné & Deci, 2005). According to SDT, contexts that satisfy employees' needs for autonomy, competence, and relatedness yield higher levels of autonomous motivation while those that do not lead to controlled motivation. Research has shown that autonomous motivation improves performance and wellbeing compared to controlled motivation (Gagné & Deci, 2005). When comparing challenge and hindrance stress appraisals, one could reasonably assume that need satisfaction is more likely to be met under challenging circumstances. By definition, contrary to hindrance stress, challenge stress is associated with a high level of perceived control which is central to satisfying the need for autonomy (Cavanaugh et al., 2000; LePine et al. 2005; Wallace et al., 2009). Decision latitude and increased control have been shown to attenuate the negative effects of stress (Karasek & Theorell, 1990; Wall et al., 1996). Challenge stress should also satisfy the need for competence because it is perceived to be associated with growth and goal achievement compared to hindrance stress which is associated with barriers to such pursuits. Finally, although not the direct focus of the challenge-hindrance model of stress, one may even extrapolate the effects of both types of appraisals on satisfying the need for relatedness, the third requirement for self-determination to materialize as suggested by SDT. The literature on the relationship between stress and burnout is more extensive than that between stress and engagement. Whilst both types of stress induce emotional exhaustion (Crawford et al., 2010), i.e., the affective dimension of burnout (Maslach, 1982), the link between hindrance stress and exhaustion has been shown to be stronger than that between challenge stress and exhaustion (see Yao et al., 2015, for empirical evidence using two samples). Emotional exhaustion is akin to emotional depletion. As such, hindrance appraisals that are more responsible for exhaustion should be more preventative in the satisfaction of the need for relatedness compared to challenge

appraisals. Research on interpersonal relations and stress have consistently shown that positive social interaction and peer support are necessary for allaying the negative reactions of stressful job demands (Johnson & Hall, 1988). All things considered, SDT predicts that challenge appraisals can satisfy the three needs for autonomy, competence, and relatedness more effectively than hindrance appraisals and therefore would be associated with an increase in autonomous motivation and performance. Hence, I propose that:

Hypothesis 17: Challenge appraisals are positively related to in-role performance.
Hypothesis 18: Hindrance appraisals are negatively related to in-role performance.

If studies investigating the effect of stressors on performance through stress appraisals are paltry, those incorporating individual differences as boundary conditions, and in particular, stress mindsets, are sorely lacking in organizational behavior. This is somewhat surprising given that individual differences as they relate to various occupational domains and contexts are a foundational subject within the field. In the next section, I conclude the thesis's conceptual development section by articulating how stress mindset modulates both challenge and hindrance appraisals' influence on work performance.

3.7. Stress mindset and the association between appraisals and performance

As discussed, stress mindset represents a meta-cognitive belief about the nature and outcomes of stress in general (Crum et al., 2017). Research has shown that individuals with a stress-is-enhancing mindset show more cognitive flexibility, cognitive abilities, positive affectivity, wellbeing, and more approach motivation compared to individuals who have a stress-is-debilitating mindset (Crum et al., 2017; Kassam et al., 2009). Broadly speaking, a feature that separates positive from negative mindsets is an individual's belief about the impact of stress on performance and productivity. Opposite to those with a stress-is-debilitating mindset, employees having a stress-is-enhancing mindset believe that stress positively influences performance and, as such, will exert more effort under stress, especially if the stress is appraised as challenging.

A consistent finding about stress mindsets is their influence on experienced affect during a stressful encounter. Challenge stressors are strain inducing but the pernicious effects of this strain on one's affective state is counteracted by their motivational potential. Individuals with a positive stress mindset are more likely to experience positive affect associated with a challenge stress appraisal because they are more attentive to the growth-inducing aspects of the situation. These individuals are also the ones who are more likely to experience a lower level of negative affect when encountering hindrance appraisals because they are more likely to be optimistic in harsh situations. Affective events theory (Weiss & Cropanzano, 1996) explains how emotions resulting from work characteristics or events can result in matching affect-driven behaviors. Therefore, people with a positive stress mindset are more likely to behave in a manner that matches this affective state, which would result in increased work performance.

The same picture could be drawn from a demand-resource perspective. Stressful job demands require emotional and cognitive effort (Cooper, Dewe, & O'Driscoll, 2001; Lazarus & Folkman, 1984; Lin et al., 2015). As discussed, Hobfoll's (1989, 2001) conservation of resources theory stipulates that one's reservoir of available resources is limited. Any combination of situational and individual characteristics that maximizes resource availability should produce high performance while a reduction in resources should do the opposite (Wang, Liao, Zhan, & Shi, 2011; Witt & Carlson, 2006). Individuals with a positive mindset have been shown to

possess higher cognitive ability, cognitive flexibility, and positive affectivity compared to their negative-mindset counterparts. These individuals ought to access more cognitive and emotional resources when faced with stress, regardless of its type. Compared to a person possessing a stress-is-debilitating mindset, one with a stress-is-enhancing mindset – and faced with challenge or hindrance stress – will be able to funnel more resources toward handling the stressor and achieving the task at hand, all of which are intended to boost performance. Therefore, I predict that a stress-is-enhancing mindset will help augment the propitious effects of challenge appraisals and buffer the inauspicious effects of hindrance appraisals on performance:

Hypothesis 19: Stress mindset will strengthen the positive relationship between challenge appraisals and performance, such that individuals with a more positive stress mindset will perform at a higher level than those with a less positive stress mindset.

Hypothesis 20: Stress mindset will weaken the negative relationship between hindrance appraisals and performance, such that individuals with a more positive stress mindset will perform at a higher level than those with a less positive stress mindset.

So far, I have discussed how experiencing various stressors can lead to differential appraisals of challenge and hindrance stress based on one's stress mindset, the latter of which also moderates the relationships between appraisals and performance. Following the transactional theory of stress (Lazarus, 1981; Lazarus & Folkman, 1984), I expect that appraisals will be the mechanism by which stressors will influence performance. Given this line of reasoning, I posit the last set of hypotheses:

Hypothesis 21: Challenge appraisals will mediate the relationship between challenge stressors and performance.

Hypothesis 22: Challenge appraisals will mediate the relationship between hindrance stressors and performance.

Hypothesis 23: Hindrance appraisals will mediate the relationship between hindrance stressors and performance.

Hypothesis 24: Hindrance appraisals will mediate the relationship between challenge stressors and performance.

3.8. A note on the relationship between engagement and in-role performance

Work engagement has been studied as a precursor to and, at times, a consequence of performance. Goering et al.'s (2017) meta-analysis on the nomological networks of burnout and engagement explored the indirect path, i.e., from demands to performance via work engagement. Their inquiry resonated well with the recommendations made in Crawford et al.'s (2010) earlier meta-analysis. In particular, the authors criticized the lack of differentiation among stress types and the one-sided focus on burnout as the main mediator in the study of the stress-to-work outcomes relationship without taking engagement into consideration as if they assume that "demands have no relationship with engagement" (p. 845). Goering and colleagues (2017) tested the mediating role of engagement in the stress-to-performance link and found that the engagement-to-performance one was positive but very weak thereby concluding that the nature

of "engagement effects on task performance is ambiguous" (p. 32). They then suggested that engagement might be a better predictor of extra-role rather than in-role performance (see also the meta-analysis by Christian, Garza, & Slaughter, 2011). Given the many issues that appear to obfuscate the field of stress research, I will not be focusing on the link between engagement and performance.

3.9. Synopsis of Hypotheses

This brief section enumerates all the hypotheses which are tested herein. They are grouped not chronologically as they are discussed in chapter 3, but according to their location in the conceptual model.

The relations of challenge and hindrance stressors to challenge and hindrance appraisals

Hypothesis 1: Challenge stressors are positively related to challenge appraisals.
Hypothesis 2: Challenge stressors are positively related to hindrance appraisals.
Hypothesis 3: Hindrance stressors are positively related to challenge appraisals.
Hypothesis 4: Hindrance stressors are positively related to hindrance appraisals.

The moderating role of stress mindset on the stressor-to-appraisal link

Hypothesis 5: Stress mindset will moderate the positive relationship between challenge stressors and challenge appraisals such that, for individuals with a more positive mindset, the relationship will be stronger than for individuals with a less positive mindset.
Hypothesis 6: Stress mindset will moderate the positive relationship between challenge stressors and hindrance appraisals such that for individuals with a more positive mindset, the relationship will be weaker than for individuals with a less positive mindset.
Hypothesis 7: Stress mindset will moderate the positive relationship between hindrance stressors and challenge appraisals such that for individuals with a more positive mindset, the relationship will be stronger than for individuals with a less positive mindset.
Hypothesis 8: Stress mindset will moderate the positive relationship between hindrance stressors and hindrance appraisals such that for individuals with a more positive mindset, the relationship will be weaker than for individuals with a less positive mindset.

The relations of challenge and hindrance appraisals to engagement and performance

Hypothesis 9: Challenge stress appraisals are positively related to work engagement.
Hypothesis 17: Challenge appraisals are positively related to in-role performance.
Hypothesis 10: Hindrance stress appraisals are negatively related to work engagement.
Hypothesis 18: Hindrance appraisals are negatively related to in-role performance.

Stress mindset as a moderator of the appraisal-engagement and -performance links

Hypothesis 11: Stress mindset will strengthen the positive relationship between challenge appraisals and work engagement, such that individuals with a more positive stress mindset will experience a higher level of work engagement than those with a less positive stress mindset.
Hypothesis 12: Stress mindset will weaken the negative relationship between hindrance appraisals and work engagement, such that individuals with a more positive stress mindset will experience a higher level of work engagement than those with a less positive stress mindset.
Hypothesis 19: Stress mindset will strengthen the positive relationship between challenge appraisals and performance, such that individuals with a more positive stress mindset will perform at a higher level than those with a less positive stress mindset.
Hypothesis 20: Stress mindset will weaken the negative relationship between hindrance appraisals and performance, such that individuals with a more positive stress mindset will perform at a higher level than those with a less positive stress mindset.

The mediating roles of challenge and hindrance appraisals

Hypothesis 13: Challenge appraisals will mediate the relationship between challenge stressors and work engagement.

Hypothesis 14: Challenge appraisals will mediate the relationship between hindrance stressors and work engagement.

Hypothesis 21: Challenge appraisals will mediate the relationship between challenge stressors and performance.

Hypothesis 22: Challenge appraisals will mediate the relationship between hindrance stressors and performance.

Hypothesis 15: Hindrance appraisals will mediate the relationship between hindrance stressors and work engagement.

Hypothesis 16: Hindrance appraisals will mediate the relationship between challenge stressors and work engagement.

Hypothesis 23: Hindrance appraisals will mediate the relationship between hindrance stressors and performance.

Hypothesis 24: Hindrance appraisals will mediate the relationship between challenge stressors and performance.

CHAPTER FOUR

4. Methods

This chapter discusses how participants were recruited and the criteria used to decide whether their data should be retained or dropped. Also discussed in detail are the various measures used to test the model and the criteria used to select items whenever shorter instrument versions were necessary. Scales, sample items, and reliabilities are presented where needed.

4.1. Participants and Procedure

With few exceptions (Prem et al., 2017; Rodell & Judge, 2009; Tadić et al., 2015; Tadić et al., 2017), studies tracking fluctuations in challenge and hindrance stressors are lacking. This scarcity is even more pronounced when it comes to assessing variations in stress appraisals. In a study that looked at short-term changes in appraisals, Prem et al. (2017) asked knowledge workers to answer three questionnaires per day over five days pertaining to two challenge stressors (time pressure and learning demands). They then asked them to appraise the stressors using three-item measures on how challenging/hindering the work was, and found that the effects of challenge and hindrance stress on learning and vitality were mediated by appraisals.

Although a good start, the study revealed several major weaknesses. For example, while the authors correctly identify appraisals as the mechanism by which stressors affect the outcome under consideration, they restrict their predictors to what they consider to be challenge stressors. This is problematic because, as argued in the conceptual development of this thesis, extant research has shown that what authors classify as hindrance stressors could be extended to both types of appraisals, sometimes equally. Another weakness rests with the appraisal measure used which follows that in Ohly and Fritz (2010). The three (3) items used to gauge appraisals actually inquire about perceptions of stress at work in a general sense. This is a subtle yet critical issue because participants might respond to such an inquiry based on the most salient stressor to them, and not necessarily one of the two employed in the study. Bureaucracy, for instance, may be a common cause for time pressure and hindrance appraisals and, as such, may turn out to confound the tested relationship and reduce the study's internal validity. The issue with appraisal measurement surfaces when one looks at the low internal consistency reliabilities reported (Cronbach alpha of challenge appraisal = .60; alpha of hindrance appraisal = .59). These low reliabilities might help explain the nonsignificant-to-small correlations between the appraisals at the person (b = .16, ns) and day levels (b = .16, p < .05). Lastly, as the authors remark, the focus on knowledge workers may lower the external validity of the study limiting its generalizability. As I discuss next, this thesis builds upon previous research and tries to address the various methodological shortcomings identified using an improved design and more reliable measures. The methodological approach used here is discussed in great details in the next chapter.

Data for this thesis was collected from two main sources, one from participants who were compensated for their participation and the other from volunteers. Diversifying data sources should increase the generalizability of the research compared to most other studies that have relied exclusively on one source. Each participant source is described in greater detail below.

Regarding the first data source, full-time employees from both Canada and the United States were recruited via Amazon Mechanical Turk (or MTurk) to take part in a study about their daily work experiences in return for financial compensation. Published studies on challenge and hindrance stress featuring participants recruited online and employing experience sampling have demonstrated the appropriateness and validity of such a sample and research design, respectively

(e.g., Rodell & Judge, 2009). Research participation via MTurk has been the subject of numerous scholarly discussions and, overall, has been shown to yield high-quality responses (Bartneck, Duenser, Moltchanova, & Zawieska, 2015; Buhrmester, Talaifar, & Gosling, 2018; Chandler & Shapiro, 2016; Hauser & Schwarz, 2016).

I opted to limit potential participants to either Canadian or American full-time employees. Given the confusion surrounding the numerous links being studied with some being explored for the first time, this decision was made to increase the cultural variability of the sample whilst maintaining its ecological validity. That is, the sample under study was intended to represent natural variability in the community without being 'forced' through selective sampling from different countries whose work cultures may differ drastically from one another. In the past, differences in findings from stress research have been attributed to extreme differences in a given sample's reciprocity and social binding norms, to name a few (e.g., Abbas & Raja, 2019). Most studies have also come from fairly homogenous samples. After conducting a pilot study to determine the compensation that would be deemed fair for the task at hand, I offered $14.00 USD, $4.00 for the lengthy first questionnaire, and $2.50 for each of the four subsequent shorter ones. Discrepancy between what one receives and what one wants results in higher levels of dissatisfaction (Berry, 1997). Such a dissatisfaction might add unwanted noise to measures that are largely based on one's perception thus lowering one's motivation to complete the questionnaires with attentiveness. To address this issue, at the end of the last questionnaire, an open-ended question was added inquiring about compensation fairness. No issues were reported.

As mentioned, to be included in the study, participants were required to answer a series of questionnaires for five consecutive workdays. All questionnaires were administered online using the electronic survey design platform powered by Qualtrics (https://www.qualtrics.com/). Ethics approval was received by Concordia University for research involving human participants (# IRB 30009139). Although all of the hypotheses here reside at the level of the individual and not the day (i.e., Level 2 or between-individuals rather than Level 1 or within-person), I collected data about participant experiences during all five consecutive workdays beginning on Monday and ending on Friday. This is meant to control, by inclusion, any fluctuations in the measured variables that might be due to factors such as the specific day of the week in which data was collected. For example, we know that predictable changes in affect happen throughout the week. Normally considered products of cognitive appraisals (Lazarus & Folkman, 1987), emotions arising from contextual factors can influence consequent appraisals (Keltner, Ellsworth, & Edwards, 1993). Patterns in affect such as the clichés 'Blue Monday' or 'Thank God It's Friday' (TGIF) have received empirical support, with studies showing that happiness indeed varies depending on the weekday (Csikszentmihalyi & Hunter, 2003). Using a large national survey of 340,000 participants, Stone, Schneider, and Harter (2012) observed that mood was generally more positive on Friday compared to other weekdays. Asking for measures on five consecutive work days, as such, will make the between-person analysis more valid as the aggregate measures for all of the participants would be based on the same combination of workdays. In total, 157 individuals completed the questionnaires via MTurk.

The second data collection was derived from the alumni base of a private liberal arts college in central New York State. In collaboration with the college's Office of College Relations and Communications, and after securing ethics approval for research involving human participants (# IRB 0218-16bx1), an invitation to participate in a study on workplace stress was sent electronically to its alumni base; potential participants were therefore graduates from all disciplines. All back and forth communications were channeled through one of the college's full-

time management professors. Alumni who expressed interest in completing the study were offered four possible work weeks (Monday thru Friday) from which they would select one work week for the study's completion. The use of four possible starting dates was decided not only to provide flexibility to participants, but also to render the logistics more manageable given the large number of respondents. These logistical tasks centered around communicating with participants on each day, prompting them to complete the day's questionnaire as well as fielding technical questions. To incentivize participation, prospective participants were given the chance to win a $200 Amazon.com gift card. From the initial email sent by the college to solicit research participation from alumni, 540 individuals expressed an interest in participating. Of these, 336 completed all of the questionnaires over five consecutive work days (or 62.22%).

Collectively, my initial total sample from both data collection sources mounted to 493 individuals aged between 21 and 74 years (M = 38.18 years and SD = 11.94). First, participants were given a definition of a challenge and hindrance work experiences similar to previous protocols (Cavanaugh et al., 2000; Pearsall, Ellis, & Stein, 2009; Webster et al., 2011). The body of the explanation read as follows:

> *"The following set of questions will ask you to evaluate some of your work experiences TODAY. You will be asked to evaluate how much that experience is a challenge experience or a hindrance experience using the following definitions of challenge and hindrance:*
>
> ***Challenge experience**: Any challenging circumstance that, although potentially stressful, is something you think you can overcome. These circumstances can help you meet your work goals and/or be motivated.*
>
> ***Hindrance experience**: Any circumstance that interferes with your work and can stand in the way of you being able to achieve your goals. These circumstances seem like a roadblock and almost impossible to overcome."*

Participants had to confirm that they read and understood these basic definitions before they were able to move forward with the study. To gauge how focused they were during survey completion, I embedded two attention test questions, each one being a short 'fill-in-the-blanks' statement based on the above definitions. The attention questions read as follows:

> *"If the situation is something you think you can overcome and/or can help you meet your work goals and/or be motivating, then according to the definition above this is most likely appraised more as a _____.than as a _____".*
>
> *"If the situation interferes with your work and can stand in the way of you being able to achieve your goals and/or seems like a roadblock or impossible to overcome, then according to the definition above this is most likely appraised more as a _____.than as a _____".*

Each question had four possible answers among which resided the correct one. In each case, if respondents failed to select the correct option confirming their understanding, they were shown a message which repeated the definition and showed them the correct answer. Six participants who answered both questions incorrectly on all five days were removed from the sample because this provided convincing evidence of the lack of attention or effort in completing the task. Although the use of two different data sources did not add variance in age ($M_{\text{compensated}}$ = 35.77 and $M_{\text{volunteers}}$ = 39.04), tenure ($M_{\text{compensated}}$ = 7.00 and $M_{\text{volunteers}}$ = 7.17), or ethnicity (percentage White $_{\text{compensated}}$ = 83.2% and percentage White $_{\text{volunteers}}$ = 93.0%), the two samples did show some differences when it came to industry (with the compensated sample coming mostly

from technical services and the information industry while the majority of the volunteer sample came from educational and health services) and gender (percentage female $_{\text{compensated}}$ = 36.1% and percentage female $_{\text{volunteers}}$ = 71.4%). Therefore, the final sample consisted of 487 full-time employees (ages ranging from 21 to 74, *M* = 38.00, *SD* = 11.80), of which 60.2% were females (two did not indicate their gender). Average organizational tenure was 7.11 years (*SD* = 7.45). The majority (90.5%) identified as being White, while a minority identified as being either Asian (3.9%, including South, West, and East Asian) or Black (2.1%). Last, regarding industry sector, sampled participants worked mainly in educational services (21.8%) and in health care (15.4%), with 12.1% and 9% reporting that they worked in the professional/technical services and in entertainment and recreation, respectively.

4.2. Measures on Day 1

4.2.1. Challenge and hindrance stressors

I used the 16-item measure developed by Rodell and Judge (2009). The scale assesses challenge stressors using eight items to measure four types including perceived levels of workload, job responsibility, time urgency, and job complexity. Sample items include, "Today, my job has required me to work very hard" (workload), "Today, I've felt the weight of the amount of responsibility I have at work" (job responsibility), "Today, I have experienced severe time pressures in my work" (time urgency), and "Today, my job has required me to use a number of complex or high-level skills" (job complexity). The average of the daily Cronbach alphas of the challenge stressors measure was .86.

The scale measures hindrance stressors also using eight items to measure four types including red tape, role ambiguity, role conflict, and hassles. Sample items include "Today, I have had to go through a lot of red tape to get my job done" (red tape), "Today, I have not fully understood what is expected of me" (role ambiguity), "Today, I have received conflicting requests from two or more people" (role conflict), and "Today, I have had many hassles to go through to get projects/assignments done" (hassles). The average of the daily Cronbach alphas of the hindrance stressors measure was .80. This 16- item measure uses a seven-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and has been utilized in previous diary studies with acceptable reliabilities. For example, Rodell and Judge (2009) reported a mean alpha (across days) of .92 for challenge and .83 for hindrance stressors. Tadić et al. (2015) reported reliabilities of .97 and .94 for challenge and hindrance stressors, respectively. More recently, Tadić et al. (2017) reported reliabilities of .94 for challenge and .85 for hindrance stressors. In addition to adequate reliability, the measure encompasses a number of stressors at work solving two recurrent and interrelated oversights in stress research, namely 1) the selection of which stressors to investigate and 2) the rationalization for such a selection which, incidentally, is not always lucid. Here, the average reliability of the entire 16-item measure was .87.

4.2.2. Challenge and hindrance stress appraisals

Based on an existing manipulation (Cavanaugh et al.; 2000; Pearsall et al., 2009), Webster and colleagues (2011) measured appraisals by presenting participants with clear definitions of hindrance and challenge stressors. A similar approach was used here. Specifically, following exposure to the concepts, participants evaluated each stressor item, and were then asked to evaluate on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) how much they "experienced this as a challenge" and how much "they experienced this as a hindrance." This

renders each stressor to be left with the same number of challenge and hindrance appraisal items, a method that has been used in recent empirical work on stress appraisals (Gerich, 2017). Another variation of the method includes using two challenge and two hindrance appraisal items for each stressor item (Liu & Li, 2018). The rationale for such an approach resides in the notion that when evaluating a stressor, a respondent will be appraising the level of the stressor. Therefore, to capture the various appraisals, we need to assist the participant to focus on certain aspects of the stressor. Asking about specific types of appraisals, after clearly defining them, will help the respondent think about the challenging or hindering aspects of the stressor. Balancing the need for survey depth with the risk of respondent fatigue and heeding to Webster et al.'s (2011) advice, I opted to use the one-item challenge and hindrance appraisal measure for each. The average of the Cronbach alphas for the challenge and hindrance appraisals measures were .92 and.93, respectively.

4.2.3. Stress Mindset

I used the Stress Mindset Measure-General (SMM-G; Crum et al., 2013). The measure includes eight items, including samples such as "The effects of stress are negative and should be avoided," and "Experiencing stress facilitates my learning and growth." The original scale is a five-point Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). However, to keep the scales consistent and fearing that a zero (0) might connote a different meaning for research participants beyond its representation as an anchor, I used a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The average of the Cronbach alphas for the stress mindset measure in this study was estimated at .92.

4.2.4. Work Engagement

I used the highly reliable nine-item version of the Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker, & Salanova, 2006) which has been the dominant work engagement instrument in scholarly research. Sample items include "At my work today, I felt bursting with energy" (vigor), "Today, I was enthusiastic about my job" (dedication), and "Today, I felt happy when I was working intensely" (absorption). All items were scored on a seven-point rating scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Slight modifications were made to the original measure, including 1) making inquiries about the current day and 2) changing the scale from 0 to 6 to 1 to 7 for consistency. Similarly modified uses of the measure have shown suitable reliabilities (e.g., alpha of .92 in Tadić et al., 2017). The average of the Cronbach alphas for the work engagement measure was found to be .93.

4.2.5. Perceived In-Role Performance

I used the performance measure developed by Goodman and Svyantek (1999) with a reference shift to measure a participant's perceived in-role performance. Measures with the same reference shift have been used before in diary studies with sufficient reliability (e.g., alpha = .90 in Schreurs, Hetty van Emmerik, Günter, & Germeys, 2012). The measure has nine items and uses a seven-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Sample items with a reference shift include "Today, I achieved the objectives of my job" and "Today, I fulfilled all the requirements of my job." The average Cronbach alphas for the in-role performance measure in this study was .80.

4.2.6. Demographics and Work-Related Information

The most pertinent questions in this area included those on age, gender, organizational tenure, industry, and ethnic background.

4.3. Measures on Days 2 to 5

The "full" questionnaires were used every day with the alumni participant cohort (volunteer) as the initial pitch included a longer estimate of the time required for the completion of Day 2 thru 5 online surveys. For those participants recruited via MTurk (paid), to minimize the dropout rate and consistent with methodological suggestions for diary studies (Fisher, & To, 2012; Ohly, Sonnentag, Niessen, & Zapf, 2010) and other experience sampling approaches in stress research (Prem et al., 2017; Rodell & Judge, 2009), the questionnaires involved shortened versions of psychometrically validated measures presented in the sections below.

4.3.1. Work Engagement

Originally, I planned to use two items per dimension of work engagement, instead of three, resulting in a six-item measure relying on the same original scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Specific items for vigor were "At my work today, I felt bursting with energy" and "Today, when I got up in the morning, I felt like going to work"; for dedication, they were "I am proud of the work I did today," and "I was inspired by my work today"; and for absorption, they were "I was completely absorbed in my work today," and "Today, I felt happy when I was working intensely." The choice of items was based on their successful previous use (e.g., Ouweneel, Le Blanc, Schaufeli, & van Wijhe, 2012; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009). Due to a technical problem while replicating the Qualtrics questionnaires, the third vigor item was not dropped resulting in a final seven-item work engagement measure. The average reliability of this measure was .93.

4.3.2. In-Role Performance

I chose four out of nine items used on Day 1 to measure performance and employed the same seven-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). These items have been previously used in diary studies (Schreurs et al., 2012) and have demonstrated adequate reliability. The items were "Today, I achieved the objectives of the job," "Today, I fulfilled all the requirements of the job," "Today, I was competent in all areas of my job and handled tasks with proficiency," and "Today, I performed well in the overall job by carrying out tasks as expected." The average reliability of the performance measure was .82.

4.3.3. Stressors (Challenge and Hindrance) and their Appraisals

As discussed, challenge and hindrance stress measures for this dissertation work included two items for each of the eight subcategories of stress, for a total of 16 items. Reducing these to single-item measures risks jeopardizing the instrument's reliability (Pedhazur & Schmelkin, 1991). For appraisals, I used the same total of 16 items per appraisal as on Day 1. Other researchers have opted to use two challenge and two hindrance appraisal items for each stress item (e.g., Liu & Li, 2018). However, they only explored one type of challenge and hindrance stress, whereas my measure includes four challenge and four hindrance stressors. Therefore, I did not shorten the stressor and appraisal measures.

CHAPTER FIVE

5. Results

This chapter first introduces the overall statistical treatment and includes all the necessary steps and analyses that support the validity of various approaches, e.g., aggregation among others. Next, as I question the issue of stressor dichotomization, I provide substantial statistical support against its continued use before I proceed to hypothesis testing. A note worth mentioning to the reader at this juncture is that the order by which hypotheses were tested does not follow the one by which they were posited; this ordering choice was meant to reduce redundancies and to help streamline the discussion. As such, I first test the moderated relationships between challenge and hindrance stressors and challenge and hindrance appraisals. I then test each of the predictions pertaining to the in-role performance model followed by those involved in the work engagement model. In doing so, I include all the relevant tables and figures needed to help the reader better comprehend the results. Finally, I conclude this chapter with a synopsis of the key findings.

5.1. Statistical Analyses and Hypotheses Testing

First, I verified whether or not data aggregation was warranted in order to test my between-person hypotheses. To do so, I followed the suggestions outlined by LeBreton and Senter (2008) and Biemann, Cole, and Voelpel (2012) and utilized the Excel MACRO that was designed to accompany the latter work. I first calculated and analyzed the interrater agreement index $r_{WG}(j)$ followed by an examination of the interrater reliability indices ICC(1) and ICC(2).

Next, I calculated the agreement index for each participant on every variable of interest. Before doing so, I followed best practice suggestions (see James, Demaree, & Wolf, 1984 and LeBreton & Senter, 2008) and tried to select one or more defendable null distribution(s) that represent(s) a total lack of agreement. Basically, one has to ask the following question: ‘‘If raters responded randomly, what would be the form of the distribution of scores?’’ (LeBreton & Senter, 2008, p. 829). Different biases in answering might require different null distributions to represent full lack of agreement. For example, a triangular distribution is used if the researcher suspects a central tendency bias, a skewed distribution is used in the case of either a leniency or harshness bias, and a uniform rectangular distribution is used if there are no biases (for a full discussion, see LeBreton & Senter, 2008). Normally, researchers opt to use the uniform distribution because it has the largest expected error variance and, as such, will result in the largest agreement indices. Best practices strongly recommend that researchers present several theoretically defendable distributions. Since I did not have any a priori ideas about possible biases, I will use and present the rectangular distribution coupled with a slightly skewed distribution. Participants answering questions about stress might become more cognizant of their experiences and progressively have a more biased evaluation of the stressor and the accompanying challenge and hindrance assessment. The skewed distribution represents a more conservative evaluation of the indices in this dissertation. Another issue worth considering deals with what to report in particular. Given that I am calculating the agreement indices for several hundred participants and for multiple variables, I again followed best practices and present the means, standard deviations, medians, and significance of the indices utilizing both distributions in Table 1.

Insert Table 1 about here

Traditionally, researchers have used .70 as a cutoff benchmark when making a decision about whether or not the agreement index justifies aggregation. A more in-depth examination of this heuristic by James et al. (1984) shows that this association is not, in fact, true. LeBreton and Senter (2008) called this "a line in the sand" (p. 835) and suggested a revised set of standards with agreement indices below .30 indicating lack of agreement, those between .31 and .50 indicating weak agreement, between .51 and .70 indicating moderate agreement, between .71 and .90 indicating strong agreement, and above .90 indicating very strong agreement. A closer inspection of the various agreement indices reported in Table 1 illustrates that the means and medians of the indices for all variables of interest are larger than .70 with most falling above .90. In addition, following the suggestions of Lebreton and Senter (2008) regarding proper data handling from individuals having low agreement values, I looked at the percentage of cases featuring low agreement on all the variables and found one case utilizing the uniform distribution and three using the more conservative skewed distribution. Scrutinizing each variable individually, I found that the percentage of participants who had an agreement index above the traditional .70 cutoff point ranged between 88.11% and 98.19% for the uniform distribution and between 73.57% and 96.38% for the skewed distribution. Lastly, I also followed their recommendations by testing the extent to which the computed agreement values were significantly different from zero. The analysis showed that the test was significant for the indices of all of the variables in the study (in-role performance F ratio = 4.54, p = .00; work engagement F ratio = 8.20, p = .00; stress mindset F ratio = 35.41, p = .00; challenge stressors F ratio = 9.31, p = .00; hindrance stressors F ratio = 14.01, p = .00; challenge appraisals F ratio = 13.76, p = .00; hindrance appraisals F ratio = 13.97, p = .00). All in all, the $r_{wg(j)}$ agreement indices support aggregation.

I then examined the interrater reliability indices, ICC(1) and ICC(2), to determine if they also support aggregation (see Table 1). While ICC(2) represents the reliability of group means, ICC(1) is the variance that can be attributed to group membership and can be looked at as an effect size estimate (i.e., the effect of group membership on the variance in an individual's ratings). For instance, an ICC(1) of .05 indicates that 5% of the variance in Level 1 ratings are attributed to Level 2 membership. Researchers have thus suggested that ICC(1)'s of .01, .10, and .25 are indicative of small, moderate, and large effects, respectively. Moreover, ICC(1) is important because one can only obtain large ICC values by having good interrater reliability and agreement (Biemann et al., 2012; LeBreton & Senter, 2008). Although Likert-type response formats tend to underestimate both ICC(1) and ICC(2), a close look at Table 1 shows that my variables' ICC(1) values ranged between .23 and .74 and that their ICC(2) values ranged between .78 and .97 thereby showing 1) a large-to-very large effect of group membership and 2) a reliable group mean – both of which support aggregation.

Correlations, means, and standard deviations are presented in Table 2.

Insert Table 2 about here

5.2. Challenge and Hindrance Stressors: Are they Appraised Correspondingly as Such?

As I alluded to in the literature review, researchers have dichotomized stressors into challenge and hindrance stressors and, even when they rarely include appraisals, they also dichotomize appraisals assuming that challenge and hindrance stressors are each appraised in this exact manner. In other words, a given person will always appraise a challenge stressor (e.g., increased workload) as a challenge and never as a hindrance. I also discussed how this flawed or simplistic assumption contradicts the theoretical frameworks on which several researchers base their hypotheses and included the modicum of papers that challenged this dichotomization (e.g., Webster et al., 2011). My first four hypotheses argue against dichotomization in appraisals and predict that both challenge and hindrance stressors will be positively related to each appraisal. In contrast to the traditional view that challenge and hindrance stressors are 'neatly' appraised as challenging and hindering, respectively, I propose that irrespective of the nature of the stressor individuals will appraise it as challenging *and* hindering albeit to different degrees.

Insert Figure 2 about here

Table 3 depicts the daily and overall correlations between each challenge stress dimension and its respective challenge and hindrance appraisal. Table 4 does the same for the hindrance stress dimensions, and Table 5 shows the values for the four challenge stressors combined and the four hindrance stressors combined.

Insert Table 3 about here

Insert Table 4 about here

Insert Table 5 about here

Please note here that when checking the relationship between the four challenge and hindrance stressors and their appraisals, I only used the appraisals associated with these stressors (i.e., the relationship between the four challenge stressors and the challenge appraisals of these four challenge stressors and hindrance appraisals of these four challenge stressors) (see Figure 2). Table 5 also includes the same analyses for the aggregated eight stressor dimensions (i.e., both challenge and hindrance stressors combined) and the challenge and hindrance appraisals of this aggregated stressor. As mentioned, the traditional approach in the literature assumes that people experiencing what is deemed to be a purely challenge stressor will evaluate it purely as challenging and the same will apply for hindrance stressors. Looking at Table 3, regardless of which stressor category one examines, any given stressor is significantly correlated with *both* of its appraisals, with the exception of the hindrance appraisal associated with workload on Day 3 which reached marginal significance. In addition, the correlations were positive except for that between job complexity and its hindrance appraisal which was significantly negative. Table 4 looks at the same correlations but for the stressors that are normally categorized as being hindering. The same story unfolds here: the stressors were significantly and positively correlated with their challenge and hindrance appraisals. A few exceptions were three daily role ambiguity challenge appraisals with one being nonsignificant and two being marginally significant. In

summary, the dimension-level daily correlations (and that over the five days) show a strong support for my prediction that stressors will be positively related to both types of appraisals with the exception again being job complexity which was positively correlated to its challenge appraisal but negatively correlated to its hindrance appraisal.

Before testing hypotheses, a factor analysis was performed to see if the eight dimensions loaded on their respective factors. Two factors emerged with an eigenvalue above 1 and collectively explain 73.74% of the variance in the data. All of the dimensions loaded on their respective factors with loadings above .60, except role conflict which had a loading of .47 but managed to still load more strongly on the hindrance factor. Looking at the challenge and hindrance stressor measures (Table 5), there is strong evidence of support for my reasoning. As predicted, both challenge and hindrance stressors and even the measure of combined stressors depict that the correlations between the stressors and their respective challenge and hindrance appraisals were always positive and significant. Challenge stressors correlated more strongly with their challenge appraisals compared to their hindrance appraisals, and hindrance stressors correlated more strongly with their hindrance appraisals compared to their challenge appraisals. This difference disappears when looking at the combined measure of stressors for which the correlations with the two appraisals were basically equal (challenge appraisal = .61, p = .00 and hindrance appraisal = .60, p = .00).

Multivariate regression was then employed to test the relationships. Similar to the correlation analyses, I investigated the issue at both the dimension and stressor levels, as well as at the overall level. Table 6 shows the relevant effect sizes, standard errors, t and p values for the various associations between the challenge stress dimensions and their respective challenge and hindrance appraisals. Table 7 includes the same information for the hindrance dimensions, and Table 8 again displays the findings but at the stressor level and portrays the relations between challenge and hindrance stressors and each of their challenge and hindrance appraisals in addition to those of combined stressors.

Insert Table 6 about here

Insert Table 7 about here

Insert Table 8 about here

Looking at the findings for the challenge and hindrance stressor dimensions, as expected, the results were similar to the previous correlational analyses with the exception of one daily workload-hindrance appraisal relationship (marginally significant) and two daily responsibility-hindrance appraisal relationships with one being nonsignificant and the other being marginally significant. The five-day correlations between challenge stressors and appraisals of both kinds (challenge and hindrance) were positive except the one between job complexity and hindrance appraisal which was, like for the correlational analyses, significantly negative (Table 6). The same general findings are begotten when looking at the relationship between hindrance stressors and their corresponding appraisals. The majority of variable relationships over the five working days were positive and highly significant. Exceptions included role ambiguity which showed one

nonsignificant relationship with its challenge appraisal on Day 2 and a marginally significant relationship with the same appraisal on Days 3 and 5.

When it comes to challenge and hindrance stressors (each including four stressor dimensions) and their relationship with their respective challenge and hindrance appraisals, Table 8 shows that both challenge and hindrance stressors are positively related to their challenge (B = .72, p = .00) and hindrance appraisals (B = .26, p = .00). Challenge stressors are more strongly related to their challenge appraisals than to their hindrance ones which could be attributed to the only negative association between job complexity and its hindrance appraisal. The appraisals of the hindrance stressors tell a similar story with the association between the stressors and their hindrance appraisals (B = .78, p = .00) being stronger than those of their challenge appraisals (B = .50, p = .00). Last, I looked again at the link between the combined stressors (including all eight stressor dimensions) and their respective appraisals; the stressors were basically equally related to their challenge (B = .67, p = .00) and hindrance appraisals (B = .65, p = .00). As such, from these results, we could say that there is strong evidence in favor of hypotheses 1 through 4 which predict that challenge and hindrance stressors will be positively related to both their challenge and hindrance appraisals. This finding is noteworthy in stress research, in particular, because of the overt reliance on stressor dichotomization and an avoidance for appraisal assessment.

5.3. Testing the Predictions in the Model with In-Role Performance

Before testing my other hypotheses, I first tested the predictive power of the *undifferentiated* stressors on in-role performance. Combined stressors predicted a very small but statistically significant decrease in performance (B = -.073, p = .031, C.I. [-.140 -.007]) with the model explaining only 1% (R = .098) of the variance in in-role performance. This is consistent with Muse et al. (2003) who observed that 46% of studies spanning 25 years found a negative relationship between stress and performance. Using the *differentiated* stressors, as suggested in the current literature, tells a different story altogether. Challenge stressors positively and significantly predicted performance (B = .18, p = .00, C.I. [.114 .236]) whereas hindrance stressors negatively and significantly predicted performance (B = -.26, p = .00, C.I. [-.325 -.198]). This model also explained 12.4% of the variance in performance (R = .352). These clear results seem to differ slightly from the findings of a recent meta-analysis by Mazzola and Disselhorst (2019) in which the authors indicate a significant negative correlation between hindrance stressors and performance and a nonsignificant correlation between challenge stressors and performance. This meta-analysis, although a good effort to test the challenge-hindrance model, is based only on five effect sizes. Another major difference is that none of the studies included in the meta-analysis measured perceived in-role performance, but rather used performance reported by others (mainly supervisors) and one used a single-item performance measure. According to the transactional theory of stress (Lazarus, 1991), appraisals are more proximal to stress outcomes than the stressors; that is, stressors are said to be more distal to stress-related outcomes. Performing the same analyses here, challenge appraisals positively and significantly predicted in-role performance (B = .18, p = .00, C.I. [.125 .230]) and hindrance appraisals negatively and significantly predicted in-role performance (B = -.30, p = .00, C.I. [-.355 -.234]). The present model's effect sizes were slightly larger than those obtained using stressors and the model here explained 18.4% of the variance in in-role performance (R = .429). Putting it all together, I tested a model with the two stressor categories as independent variables,

the challenge and hindrance stress appraisals as mediators (including the link between stressors and their opposite appraisals), and in-role performance as the outcome variable (see Figure 3).

Insert Figure 3 about here

For hypotheses testing that included mediation and moderation analyses, I used conditional process analysis (Hayes, 2013, 2017, PROCESS version 2.16, Models 4 and 58) which calculates all model paths simultaneously. The analysis of the performance and engagement models includes four moderated relationships each (i.e., two models × four interactions), and considering that the employed measures show high reliabilities, PROCESS is useful in this case as it alleviates potential issues with non-normal interaction terms by using bootstrapping via repeated sampling with replacement. I used the recommended 10,000 bootstrap samples. The complete results of the mediation analyses are presented in Table 9.

Insert Table 9 about here

The initial analyses (presented in Tables 3, 4, and 5 and represented in Figure 2), tested the degree to which stressor dimensions and categories are positively related to *their* challenge and hindrance appraisals by using the appraisals associated with the stressor dimension or category. For example, I tested the relationship between workload and the challenge and hindrance appraisals of workload and between the challenge stressor dimension (including the four challenge dimensions) and the challenge and hindrance appraisals of those four stressors. What I found was that there is strong evidence for a significant positive relationship between the stressor and both of its appraisals at the dimensional (e.g., workload, job complexity, hassles), categorical (challenge stressors and hindrance stressors), or overall levels (i.e., all stressors).

The analyses involving the mediators represent the challenge and hindrance appraisals of all of the stressors as these appraisals are predicted to be related to both challenge and hindrance stressors as depicted in Figures 1 and 3. Thus, the relationships tested in the model do not represent a 'pure' test of stressor-appraisal associations as before, but rather a test of the relationships specific to the model presented in this dissertation. Challenge appraisals were positively related to both challenge stressors (Effect =.50, p = .00, C.I. [.424 .572]) and hindrance stressors (Effect = .16, p = .00, C.I. [.079 .234]). Hindrance appraisals were positively related to hindrance stressors (Effect = .63, p = .00, C.I. [.560 .704]) but not to challenge stressors (Effect = .04, p = .27, C.I. [-.031 .108]). We could therefore say that, for this model in particular, support was found for hypotheses 1, 3, and 4, but not for 2. The analysis showed that overall challenge appraisals positively predicting performance (Effect = .17, p = .00, C.I. [.087 .244]). This lent support for hypothesis 17. In addition, overall hindrance appraisals negatively predicted in-role performance (Effect = -.21, p = .00, C.I. [-.293 -.126]) thereby supporting hypothesis 18. Since PROCESS does not allow the inclusion of two (2) independent variables simultaneously, I followed Hayes's (2013) recommendations (section 6.4) and ran the model twice, once with challenge stressors as the independent variable and hindrance stressors as a covariate and the reverse assignment in the other. All model parameters remained the same but the two analyses provided the needed various indirect effects. Challenge appraisals mediated the link between challenge stressors and in-role performance (Effect = .08, Boot SE = .03, C.I. [.030 .140]), whereas hindrance appraisals did not (Effect = -.01, Boot SE = .01, C.I. [-.027 .007]). The direct effect of challenge stressors on in-role performance was significant (Effect = .10, p = .01,

C.I. [.030 .171]). As such, the hypothesis positing that challenge appraisals will mediate the association between challenge stressors and performance (H21) was supported; yet the one predicting the same mechanism through hindrance appraisals was not (H24). In the case of hindrance stressors, the direct effect of hindrance stressors on in-role performance was still significant (Effect = -.15, p = .00, C.I. [-.234 -.075]). Looking at the two indirect effects, i.e., the relationships between hindrance stressors and in-role performance, we find that the effect through challenge appraisals (Effect = .03, Boot SE = .01, C.I. [.006 .057]) as well as that through hindrance appraisals (Effect = -.13, Boot SE =.03, C.I. [-.206 -.069]) were significant supporting both hypotheses H22 and H23, respectively.

5.4. Stress Mindset Moderating the Stressors-to-Appraisals Relationships

Model 58 in PROCESS represents a mediational model with one variable moderating both the independent variable-to-mediator link and the one connecting the mediator to the dependent variable. Such a relation wherein moderators are operating on both sides of a mediation is dubbed 'moderated moderated mediation.' Complete results of both the moderation and moderated moderated mediation analyses for in-role performance are presented in Table 10.

Insert Table 10 about here

Stress mindset did not moderate the relationship between challenge stressors and challenge appraisals (Effect = .02, p = .52, C.I. [-.033 .066]), failing to provide support for hypothesis 5. Stress mindset, however, moderated the challenge stressor-to-hindrance appraisal relation (Effect = -.06, p = .02, C.I. [-.107 -.010]). This moderation effect was also in the predicted direction: people having a more positive stress mindset reported lower hindrance appraisals at higher challenge stressor levels in contrast to those having a less positive stress mindset.

Insert Figure 4a about here

This can be seen in Figure 4a which shows the relationships between challenge stressors and hindrance appraisals at three levels of stress mindset, namely low representing scores 1 SD below the mean, high representing scores 1 SD above the mean, and moderate representing scores in between. As can be noticed, individuals with a high positive mindset show the least positive slope followed by those individuals with a moderate positive mindset and then finally those with a low positive stress mindset. Simple-slope analysis offers more details of this phenomenon. The strongest effect of challenge stressors on hindrance appraisals was for the low positive stress mindset cohort (Effect = .43, p = .00, C.I. [.228 .636]). Individuals having a low positive stress mindset expressed more hindrance appraisals at increasingly higher challenge stressors. This group was closely followed by individuals having a moderate positive stress mindset (Effect = .36, p = .00, C.I. [.273 .453]) and showcasing a smaller effect of stressors on appraisals. For individuals having a high positive stress mindset, the relationship was not significant (Effect = .11, p = .25, C.I. [-.074 .284]). This is an interesting finding because it shows that those with high levels of positive stress mindset are not appraising the challenge stressors to be hindering even at very high stressor levels. This also lends support for hypothesis 6 which stated that the stronger the positive mindset, the weaker the link between challenge stressors and hindrance appraisals.

Next, I looked at the moderating role of stress mindset on the hindrance stressors-to-appraisals relationship. I hypothesized that people having a more positive stress mindset will be more likely to realize the challenging aspects of hindrance stressors compared to those with a less positive stress mindset. Mindset did, in fact, moderate the relationship between hindrance stressors and challenge appraisals (Effect = .07, p = .01, C.I. [.021 .123]). This interaction was in the expected direction and Figure 4b illustrates the relationship between hindrance stressors and their challenge appraisals at three levels of stress mindset.

Insert Figure 4b about here

As one can see from the figure, the sharpest increase in challenge appraisals at increasingly higher hindrance stressors is that associated with individuals having high positive stress mindset, followed by those with a moderate positive stress mindset and finally by those with a low positive stress mindset. Again, a simple-slopes analysis demonstrated that the effects for all three levels were significant, the largest being among individuals with a high positive stress mindset (Effect = .57, p = .00, C.I. [.375 .772]), followed by those with a moderate stress mindset (Effect = .43, p = .00, C.I. [.339 .527]), and finally by those with the lowest stress mindset (Effect = .27, p = .00, C.I. [.087 .450]). Thus, these findings lend strong support for hypothesis 7.

Finally, I analyzed the moderating role of stress mindset on the positive relationship between hindrance stressors and hindrance appraisals. I had expected that a high positive stress mindset would buffer this positive association. The moderation was both significant and in the predicted direction (Effect = -.10, p = .00, C.I. [-.153 -.055]). Figure 4c shows the relation between hindrance stressors and hindrance appraisals at the three levels of stress mindset.

Insert Figure 4c about here

As depicted graphically, individuals with a high positive stress mindset reported the lowest hindrance appraisals at increasingly higher levels of hindrance stressors compared to those having a lower positive stress mindset. The sharpest increase in hindrance appraisals was, again, associated with individuals scoring low in stress mindset. Again, a simple-slopes analysis revealed that the effects for all three levels were significant, with the effect being the weakest for individuals reporting high positive stress mindset (Effect = .25, p = .01, C.I. [.071 .438]), followed by an effect slightly stronger for those with a moderate mindset (Effect = .70, p = .00, C.I. [.622 .770]), and finally the strongest effect for those reporting the lowest levels of stress mindset (Effect = .76, p = .00, C.I. [.619 .898]). Together, these findings offer strong support for hypothesis 8.

5.5. Stress Mindset Moderating the Link between Challenge and Hindrance Appraisals and In-Role Performance

Based on the myriad of stress theories raised at the outset of this dissertation, I anticipated stress mindset to play a critical role in how stressors would be appraised and found good evidence for this conjecture. I also envisioned that this effect might extend beyond merely the appraisal formation phase, and that stress mindset might influence how these appraisals are related to various work outcomes such as in-role performance and work engagement. When considering in-role performance, significant positive and negative effects were obtained, respectively, for challenge and hindrance appraisals. Stress mindset, however, did not moderate

the challenge appraisal-to-performance relationship (Effect = -.01, p = .83, C.I. [-.054 .043]) failing to find support for hypothesis 19. When it comes to the hindrance appraisal-to-performance link, the appraisal × stress mindset interaction term was in the predicted direction but was only marginally significant (Effect = .05, p = .09, C.I. [-.007 .100]). Thus, hypothesis 20 was not supported, but there is some evidence that stress mindset plays a role in how hindrance stress appraisals impact performance. I probed this interaction further by again plotting the relationship between hindrance appraisals and in-role performance at three levels of stress mindset. Figure 5a shows this graphically.

Insert Figure 5a about here

As one can see, as levels of hindrance appraisals increase, the sharpest drop in performance is among people whose positive stress mindset is lowest, followed by those having a moderate positive stress mindset, and with the least pronounced decrease in performance among those having a high positive stress mindset. Again, I performed a simple-slope analysis to statistically explore these relationships. Individuals with low positive stress mindset had the largest significant negative effect size (Effect = -.33, p = .00, C.I. [-.482 -.181]), followed by those with a moderate positive stress mindset (Effect = -.14, p = .00, C.I. [-.210 -.066]). The interesting thing is that the effect, though negative, was nonsignificant for individuals with a high positive stress mindset (Effect = -.11, p = .14, C.I. [-.252 .037]). As such, the performance of individuals with a high positive stress mindset seems not to be influenced by higher hindrance stress appraisals compared to people with a moderately positive stress mindset and, especially, to those having a low positive stress mindset.

I have hypothesized and tested the various mediations presented in Figure 3. Although no a priori hypotheses were made about the moderated indirect effects, I will now look at these mediations while taking into consideration the moderating role of stress mindset (all relevant statistical results are presented in Table 10). When analyzing moderated moderated mediation relationships of interest, PROCESS does not enable testing for significance. However, it does provide bootstrapped confidence intervals which were used here. When looking at challenge appraisals as a mediator of the challenge stressors-to-performance link, the previously presented findings were supportive (see H21). Looking at the same mediation at the three levels of mindset, we see that the mediation remains significant at all levels: at low positive stress mindset (Effect = .07, Boot SE = .03 C.I. [.012 .144]), at moderately positive stress mindset (Effect = .07, Boot SE = .03 C.I. [.018 .129]), and at high positive stress mindset (Effect = .07, Boot SE = .03 C.I. [.005 .135]). When studying hindrance appraisals as a mediational mechanism of the challenge stressors-to-performance association, the findings did not support hypothesis 24; at the three levels of stress mindset, we see that the mediation is significant but only at low positive stress mindset levels: At low positive stress mindset (Effect = -.03, Boot SE = .02 C.I. [-.065 -.002]), at moderately positive stress mindset (Effect = -.01, Boot SE = .01 C.I. [-.023 .010]), and at high positive stress mindset (Effect = .01, Boot SE = .01 C.I. [-.009 .034]).

Next, for the hindrance stressors-to-performance link, both hypotheses regarding the mediating roles of challenge (hypothesis 22) and hindrance appraisals (hypothesis 23) were supported. Looking at the moderated moderated mediation analysis at the three levels of stress mindset, we find that the mediation via hindrance appraisals was significant at all three levels of mindset: At low positive stress mindset (Effect = -.19, Boot SE = .06 C.I. [-.312 -.0.89]), at moderately positive stress mindset (Effect = -.12, Boot SE = .03 C.I. [-.195 -.060]), and at high

positive stress mindset (Effect = -.07, Boot SE = .03 C.I. [-.136 -.014]). The mediation through challenge appraisals was nonsignificant at low positive stress mindset but was significant at both moderate stress mindset (Effect = .02, Boot SE = .01 C.I. [.005 .054]), and high positive stress mindset (Effect = .03, Boot SE = .02 C.I. [.003 .077]).

5.6. Mediational Analyses for Work Engagement

As discussed in detail in Chapter 2, the association between stress and work engagement still remains unclear (e.g. Crawford et al., 2010). To shed some light on this relationship, I first looked at how well stressors in general predicted work engagement. Undifferentiated stressors were unrelated to work engagement (B = .06, *p* = .14, C.I. [-.020 .140]) with the model explaining only about .4% (R = .067) of the variance in engagement. Using the differentiated stressors, the results became radically different. That is, challenge stressors positively and significantly predicted work engagement (B = .39, *p* = .00, C.I. [.322 .460]) and hindrance stressors negatively and significantly predicted engagement (B = -.35, *p* = .00, C.I. [-.425 -.281]) with the model explaining 23.3% (R = .483) of the variance in engagement. Mazzola and Disselhorst (2019) do report findings that are in the same direction but they lacked significance. Again, the meta-analysis is based on only three papers, two of which show significant results supporting the challenge-hindrance model. Similar to the analysis for in-role performance, I then used the more proximal challenge and hindrance appraisals to predict engagement and, again, found a noticeable improvement in the results in terms of both effect sizes and variance explained. Challenge appraisals positively and significantly predicted engagement (B = .48, *p* = .00, C.I. [.402 .548]) while hindrance stressors negatively and significantly predicted work engagement (B = -.44, *p* = .00, C.I. [-.516 -.367]), with the model explaining about 28.8% (R = .537) of the variance in engagement.

Second, I tested the mediational model in which challenge and hindrance appraisals mediate the relationships between challenge and hindrance stressors and work engagement (Figure 3). Again, using PROCESS Model 4 and the same technique used for in-role performance, I investigated the four indirect effects connecting the two stressors to work engagement via both types of stress appraisals. Results for all analyses pertaining to work engagement are presented in Tables 11 and 12.

Insert Table 11 about here

Insert Table 12 about here

The analysis showed that overall challenge appraisals positively predicted work engagement (Effect = .35, *p* = .00, C.I. [.266 .433]), supporting hypothesis 9. In addition, overall hindrance appraisals negatively predicted work engagement (Effect = -.32, *p* = .00, C.I. [-.410 -.231]), thus supporting hypothesis 10.

Third, I used the same procedure (Hayes, 2013, section 6.4) to perform the various mediational analyses. The direct effect of challenge stressors (Effect = .23, *p* = .00, C.I. [.154 .305]) and hindrance stressors (Effect = -.21, *p* = .00, C.I. [-.290 -.120]) on work engagement remained significant in the mediated model. Hindrance appraisals did not mediate the association between challenge stressors and work engagement (Effect = -.01, Boot SE = .01 C.I. [-.040 .011]), thereby failing to provide support for hypothesis 16. However, challenge appraisals did

mediate the association between challenge stressors and work engagement (Effect = .17, Boot SE = .03 C.I. [.127 .230]), thus supporting hypothesis 13. When assessing the indirect effect of hindrance stressors on work engagement, both mediations through challenge appraisals (Effect = .05, Boot SE = .02 C.I. [.020 .095]) and through hindrance appraisals (Effect = -.20, Boot SE = .03 C.I. [-.268 -.141]) were significant thereby supporting hypotheses 14 and 15, respectively.

5.7. Stress Mindset Moderating the Link between Challenge and Hindrance Appraisals and Work Engagement

This subsection focuses on the degree to which stress mindset acted as a moderator of the significant relationship between challenge and hindrance stress appraisals and work engagement. As was the case with in-role performance, stress mindset did not moderate the link between challenge stress appraisals and work engagement (Effect =-.04, p = .11, C.I. [-.092 .009]), failing to support hypothesis 11. Since the significance level in this case was close to what is commonly considered marginal significance, I looked at this interaction in more detail. I plotted the relationship between challenge stress appraisals and work engagement and analyzed the simple slopes at the three different levels of stress mindset. Figure 5b shows this analysis graphically.

Insert Figure 5b about here

As one can see from the figure above, individuals with a high positive stress mindset reported a higher work engagement at all levels of challenge appraisals compared to those having a low or moderate stress mindset. Moreover, this high level of engagement for individuals with a high positive stress mindset seems to increase as individuals report higher challenge appraisals; the increase, however, is marginally significant suggesting a high level of engagement that is relatively stable for those individuals (B = .14, p = .06, C.I. [-.005 .291]). An increase in the appraised challenge characteristics of the stressor was associated with significantly higher reported levels of work engagement for individuals with low (B = .24, p = .02, C.I. [.038 .442]) and moderate (B = .24, p = .00, C.I. [.150 .321]) positive stress mindsets.

When it comes to the relationship between hindrance stress appraisals and work engagement, positive stress mindset was found to play a significant moderating role (Effect = .08, p = .00, C.I. [.026 .136]). Figure 5c shows this interaction at the three levels of mindset.

Insert Figure 5c about here

I predicted that a higher positive stress mindset would buffer the negative effects of hindrance appraisals on work engagement. Two important points must be mentioned when viewing Figure 5c. First, both the graphical and the simple-slope analyses show that, when stressors were being appraised as hindering, the sharpest (and also significant) decrease in reported work engagement occurred for individuals having the lowest positive stress mindset (B = -.35, p = .00, C.I. [-.520 -.187]). A smaller decrease in engagement was observed for individuals with moderate (B = -.10, p = .03, C.I. [-.187 -.011]) and high positive stress mindset (B = -.20, p = .03, C.I. [-.384 -.023]). Second, individuals with a high positive stress mindset reported higher levels of engagement at every level of appraised hindrance compared to individuals with a lower positive stress mindset. Together, these findings provide strong support for hypothesis 12.

Although not hypothesized, and similar to the analyses of the various mediations for in-role performance, I tested the indirect effects of the work engagement model while taking into account stress mindset as a moderator. Again, since PROCESS does not provide a significance test for these relationships, bootstrapped confidence intervals were employed in order to draw conclusions. The moderated moderated mediation of challenge stress appraisals of the challenge stressor-to-work engagement link was significant at low (Effect = .15, Boot SE = .03 C.I. [.091 .224]), moderate (Effect = .13, Boot SE = .02 C.I. [.087 .184]), and high levels of positive stress mindset (Effect = .11, Boot SE = .03 C.I. [.055 .171]).

The predicted mediation of hindrance appraisals of the challenge stressors' relation to work engagement (H16) was not supported. This remained the case at all levels of stress mindset as all three (3) confidence intervals included zero. The moderated moderated mediation of hindrance stress appraisals of the hindrance stress-to-work engagement relationship was significant at low (Effect = -.29, Boot SE = .05 C.I. [-.386 -.207]), moderate (Effect = -.18, Boot SE = .03 C.I. [-.240 -.124]), and high levels of positive stress mindset (Effect = -.09, Boot SE = .03 C.I. [-.160 -.037]). The moderated moderated mediation of challenge stress appraisals of the hindrance stressor-to-engagement association was significant at moderate (Effect = .04, Boot SE = .01 C.I. [.019 .075]) and high levels of positive stress mindset (Effect = .05, Boot SE = .02 C.I. [.025 .095]), but not at low levels of stress mindset (Effect = .02, Boot SE = .02 C.I. [-.015 .067]).

5.8. Synopsis of findings

This thesis sampled a cohort of full-time employees from Canada and the US to explore a multivariate model comprised of various types of stressors experienced at work, their appraisals as challenges and hindrances, and two key outcomes of interest to organizational behavior, namely in-role performance and work engagement. It also investigated the extent to which positive stress mindset acted as a moderator of these interrelationships. The research design involved an experience sampling study lasting five consecutive days during a typical work week.

For brevity, in this section, I provide readers with a simple overview of the main thesis findings, leaving the full details to the forthcoming section. One point worth noting, if it was not made evident already, is that the chronological flow of the posited hypotheses and their theoretical rationale in Chapter 3 does not match the order in which the hypotheses were tested in Chapter 5. As such, this section presents a brief summary of the findings to give a bird's eye view of the empirical goals of this thesis. In addition, Table 13 was developed to help readers identify in the most efficient manner the order in which the hypotheses were tested, and which received support and which did not. As shown on the left-hand column of Table 13, I present the hypotheses in the order in which they were tested, rather than hypothesized.

Insert Table 13 about here

When considering the association between challenge and hindrance stressors and their respective appraisals, I had suggested that they are not solely appraised as either challenging or hindering, respectively. Analyses of the daily and weekly data at the level of the stressor dimension (e.g., workload, red tape) and category (challenge and hindrance stressors), as well as when both types of stressor categories were collapsed, showed that individuals positively and significantly appraised stressors as *both* challenging and hindering irrespective of what categorization the literature gives those stressors. The sole outlier was the negative correlation

between job complexity – identified in the literature as a challenge stressor – and its hindrance appraisal. Although the relationship for this singular dimension was not positive, it still illustrates that this challenge stressor, whenever appraised, is not appraised exclusively as challenging.

Stress appraisals were then included in the model as mediators describing the mechanism by which the two types of stressors impacted in-role performance, with positive stress mindset acting as a moderator in each of these relationships. In this analysis, the mediators had to include the overall challenge and hindrance appraisals (i.e., appraisals of all stress dimensions used) as they were hypothesized to be predicted by both types of stressors. First, I found a strong and significant positive relationship between challenge stressors and challenge appraisals but not hindrance appraisals. Second, hindrance stressors were positively and significantly related to challenge and hindrance appraisals. Third, as foretold, challenge appraisals predicted a significant increase in in-role performance while hindrance appraisals predicted a significant decrease in performance. With the exception of one predicted mediation—that is, that of hindrance appraisals mediating the challenge stressors-to-in-role performance association—all other indirect effects were significant. Moreover, and with the exception of the moderation of the challenge stressors-to-challenge appraisals link and the challenge appraisals-to-in-role performance one, all interactions were significant and in the expected direction [Note: Marginally in the case of the moderation of the hindrance appraisal-to-performance link]. Lastly, I inspected the model's various moderated moderated mediations, specifically the levels of the moderator where the indirect effects were significant. For instance, the nonsignificant mediation of the challenge stressor-to-performance link via hindrance appraisals was significant but only for individuals having a low positive stress mindset.

The second model investigated the effects of challenge and hindrance stressors and their appraisals on work engagement, again while considering the moderating role of positive stress mindset in these relationships. The first part of the model is common to both outcomes and, as such, I will avoid repeating summary findings. In assessing the relationship between stress appraisals and work engagement, as hypothesized, challenge and hindrance stress appraisals were significantly positively and negatively related to engagement, respectively. Support was also found for the moderation of positive stress mindset on the association between hindrance stress appraisals and work engagement, with individuals having a high positive stress mindset showing a less detrimental effect of hindrance stress appraisals on work engagement compared to individuals possessing a low positive stress mindset. However, the stress mindset × challenge appraisal interaction failed to predict work engagement and, since it approached marginal significance, I probed more deeply into the moderation analysis and found that the positive relationship was significant for those individuals with a low-to-moderate positive stress mindset albeit it was more stable (i.e., the simple-slope analysis was marginally significant) for individuals having a high positive stress mindset. Finally, I studied the moderated moderated mediation of the various indirect effects, paying particular attention to the levels of the moderator at which the indirect effects were significant. The relationships were similar, in both direction and significance, to the nonmoderated mediation relationships except for the mediation pertaining to challenge appraisals connecting hindrance stressors to work engagement which was nonsignificant at low positive stress mindset.

CHAPTER SIX

6. Discussion

I start by explaining how people tend to appraise workplace stressors by emphasizing the degree to which these appraisals are dichotomous; that is, the extent to which challenge and hindrance stressors are interpreted as "purely" challenging and hindering, respectively, or whether they might be "mixed," i.e., both types of stressors being appraised as challenging and hindering *simultaneously*. I then move to discussing how stress mindset moderates the stressors' appraisals followed by an evaluation of the appraisals' influence on in-role performance and work engagement. In this breath, I also articulate the moderating role that mindset plays in these relationships. I also explain the mediational role that appraisals play in both the stressors-to-performance and stressors-to-engagement links and comment on these mediations while taking the moderation of stress mindset into account. This discussion is also informed with additional analyses which help to illuminate the findings. Other points include managerial implications, research limitations, and theoretical contributions all of which help to carve a path toward future research horizons.

6.1. Detailed Discussion of the Findings

6.1.1. Re-evaluating the Stressor-to-Stress Appraisal Relationship

A fair portion of the theoretical review was meant to convey the importance of evaluating stress appraisals in any study dealing with the effects of stress on a given work-related outcome. In particular, I argued that the seminal work of Lazarus and colleagues (1984, 1999, 2000), on which growing research has since been published starting with Cavanaugh et al. (2000), has been foundational in espousing the centrality of appraisals as a core concept in the stressor-to-outcome relationship. There are even studies (e.g., Crawford et al., 2010) that either convincingly or passively mention appraisals in their theorizing yet do not account for them in their measurement efforts. As discussed, even those that have managed to measure appraisals either use a restricted number of stressor dimensions or make the same problematic dichotomization with appraisals as they do with stressors, an issue to which I turn to next. Even the stressor categorization is nebulous at times, with most authors classifying workload as a challenge stressor while others see it as a hindrance stressor. For example, Bakker and Sanz-Vergel (2013) characterize work pressure as a hindrance stressor and emotional demands as a challenge stressor and justify these categorizations by the type of occupational sample used (in their case, employees in a health care organization). That said, one of the contributions of this thesis is to heed previous recommendations from stress scholars by including stress appraisals as a mediating mechanism in the stressor-to-work outcomes relationship.

Another contribution of this thesis stems from what seems to be a general, but not absolute, consensus that challenge stressors and hindrance stressors are always and solely evaluated as *either* challenging *or* hindering. In most studies that survey appraisals, stressors deemed as being challenging typically have their appraisals measured as purely challenging and those deemed as hindering have their appraisals measured as exclusively hindering. In other words, scholars seem to have taken for granted that any stressor typified as a challenge will correspondingly be appraised as such without questioning the notion that some people may appraise challenge stressors as hindrances and vice versa with hindrance stressors. In recent years, however, researchers have argued for this notion by providing some preliminary evidence

for its support (e.g., Prem et al. 2017; Webster et al. 2011). This thesis contributes additional empirical support for this argument and addresses another limitation in these studies, namely the limited number of investigated stressor dimensions. For instance, Webster et al. (2011) looked at four (4), whereas Prem et al. (2017) looked at two (2). Gerich (2017), on the other hand, employed dimensions that were more numerous but largely incongruent with those used by Cavanaugh et al. (2000) on whose work he relied on. Hence, this dissertation research examines the stressor-to-stress appraisals relationship using a more exhaustive list of stressors that are consistent with Cavanaugh et al. (2000), as well as appraisal measures that have been tested before. Furthermore, I abide by the tenets of Lazarus's (1991) transactional theory of stress which is the principal theoretical framework behind the two-factor model of stress, and investigate the degree to which dichotomizing both stressors and appraisals—when the latter are rarely, if ever, used—is methodologically sound.

Here, I utilized eight (8) stressor dimensions, four (4) categorized as challenge stressors and four (4) as hindrance stressors, and looked at the correlations and the multivariate regression coefficients between each of the eight (8) stressor dimensions and their challenge and hindrance appraisals, both daily and weekly. Out of 80 daily correlations (8 dimensions × 2 appraisals × 5 days), two (2) were nonsignificant and two (2) were marginally significant. All of the correlations were positive, as predicted, except that between job complexity and its hindrance appraisal which remained negative. In sum, over the entire week and with this one exception, all of the correlations were positive and significant (see Tables 3 and 4). All correlations between stressor categories or even between the stressors combined (i.e., all 8 stressor dimensions) and their respective challenge and hindrance appraisals at the daily and weekly levels were positive and significant. The multivariate regression corroborates these findings showing only two (2) out of the 80 daily, and 16 weekly, stressor-to-stress appraisal relationships being nonsignificant and four (4) being marginally significant (with none at the weekly level). As predicted, most relationships were significant and positive except for that between job complexity and its hindrance stress appraisal (see Table 5).

When looking at the negative correlation and regression results pertaining to the relationship between job complexity and hindrance appraisals, one would expect that extreme complexity would be interpreted as a major hindrance because the opportunity for success or growth would be thwarted due to insurmountable barriers. To delve deeper into this issue, I trichotomized job complexity and retested the correlation at low (mean at -1SD), high (mean at +1SD), and moderate job complexity (in between). Results show that the correlation between job complexity and its hindrance appraisal was negative at low ($r = -.23$, $p = .04$) and moderate complexity ($r = -.34$, $p = .00$), and that it became positive with only marginal significance at high complexity ($r = .26$, $p = .09$). A similar observation consisting of a positive and marginally significant correlation between high job complexity and challenge appraisals ($r = .27$, $p = .08$). Similar results emanate from performing a multivariate analysis at the three (3) levels of job complexity. Jobs described as being low in complexity (Effect = -.19, $p = .04$ CI [-.358 -.013]) and even those described as moderately complex (Effect = -.28, $p = .00$ CI [-.364 -.200]) were significantly and negatively related to hindrance appraisals. The relation between highly complex jobs and hindrance appraisals, however, was positive yet only marginally significant (Effect = .66, $p = .09$ CI [-.102 1.414]) as was the case with the job complexity-to-challenge appraisal relationship which remained positive but became marginally significant (Effect = .18, $p = .08$ CI [-.022 .381]). This offers evidence that people may associate low to moderately complex jobs with less hindrance stress appraisals (and more challenge appraisals) but that, at extreme

complexity, these stressors start to be appraised as more hindering and less challenging. The differentiation between the two (2) stressor appraisals at various stressor levels is something I discus in the future research section.

All of the analyses presented herein support the original assumption of the transactional theory of stress (Lazarus, 1991), namely that individuals appraise stressors as both challenging and hindering. Moreover, they refute the longstanding assumption that challenge stressors are appraised only as challenges and that hindrance stressors are appraised only as hindrances. If one inspects the relationship between challenge stressors and their appraisals at the week level (i.e., averaged over Days 1 thru 5), as well as that between hindrance stressors and their appraisals (Table 7), one observes the magnitude of the relationship between each stressor category and the appraisal that fits that category (challenge stressors → challenge appraisal, Effect = .72; hindrance stressors → hindrance appraisals, Effect = .78). As such, one could understand why using dichotomized stressors could sometimes be effective in research, particularly because of the ease and convenience of measurement. However, this strategy ends up neglecting the other relationships (challenge stressors → hindrance appraisal, Effect = .26; hindrance stressors → challenge appraisals, Effect = .50) which may threaten internal validity through the unintended development of hypotheses that violate the theories they are based on and, consequently, lead researchers to erroneous findings. As such, this thesis contributes to scholarship by offering evidence to support the inclusion of both types of appraisals in any testable model that attempts to explain a workplace outcome associated with a particular stressor. A key takeaway from this thesis, therefore, is that any stressor could potentially be appraised as both challenging and hindering.

6.1.2. The Role of Stress Mindset on the Link between Stressors and Appraisals

A recent critical review and meta-analysis by Mazzola and Disselhorst (2019) urged researchers to find alternatives to the challenge-hindrance model of stress and one of their recommendations was to gravitate to an appraisal-based approach, something which I have been strongly arguing for in this dissertation. They also mention briefly in their concluding remarks that future research should look at the concept of stress mindset which is again something that I have been arguing even before this article was published.

As mentioned, while testing the hypothesis that stressors are simultaneously appraised as both challenging and hindering, I looked at the relationship of each stressor with its respective the dimension (e.g., workload and its challenge and hindrance appraisals), category (challenge and hindrance stressors and their respective appraisals), and all types of stressors (i.e., all stressors and the challenge and hindrance appraisal of all the stressors combined). When testing the two models (Figure 1), the mediators had to consist of the challenge and hindrance appraisals for all stressors because they are being predicted by both challenge and hindrance stressor categories. As expected, hindrance stressors were positively related to both hindrance and challenge appraisals; the more hindrance stressors individuals reported, the more challenge and hindrance appraisals they reported, and the association between hindrance stressors and hindrance appraisals was the stronger link of the two.

Also predicted was that individuals with a more positive stress mindset tend to see more ‘opportunities’ in hindrance stressors compared to their counterparts having a less positive stress mindset and, in turn, would more likely ascribe to hindrance stressors higher challenge appraisals. As represented in Figure 4b, those having a high positive stress mindset evaluated hindrance stressors as more challenging compared to those with a moderate and low positive

stress mindset. More precisely, simple-slope analyses showed that the effect (or slope) by which these differences became manifest was strongest for individuals high in positive stress mindset, followed by those having a moderate and then a low positive stress mindset. Another important finding was that positive stress mindset moderated the association between hindrance stressors and hindrance appraisals. Specifically, the argument made was that an individual having a high positive stress mindset will have the tools to defend against the unfavorable perceptions of hindrance associated with hindrance stressors and, in effect, have the hindrance appraisals buffered compared to a person who has a lower positive stress mindset. This moderation was substantiated, and the interaction was significant and in the expected direction. As can be clearly seen in Figure 4c, at high levels of hindrance stressors, individuals with a low-to-medium positive stress mindset appraise these stressors as much more hindering than individuals having a high positive stress mindset. Looking again at the simple-slope analyses, we notice that an average increase in hindrance appraisals for the same increase in hindrance stressors is highest for those with a low positive stress mindset followed, in descending order, by those with a moderate and a high positive stress mindset. In fact, for the same difference in stressor evaluation, individuals with a low positive stress mindset report, on average, three (3) times as much hindrance appraisals as those with a high positive stress mindset.

For challenge stressors, predictions pertaining to their association with challenge stress appraisals were identical: challenge stressors were positively related to overall challenge stress appraisals. However, positive stress mindset did not moderate this relationship. Acknowledging that this hypothesis failed to garner support, I noted the simple-slope analyses and the effects were indeed similar (Effect Low = .53, p = .00; Effect Moderate = .57, p = .00; and Effect High = .64, p = .00). Be it that the three (3) groups did not differ significantly in how challenging they described the challenge stressors, one could spot a noticeable trend in the effect sizes such that persons having the highest positive stress mindset demonstrated the strongest effect followed by those with a moderate and finally those with the lowest positive stress mindset. This is also shown graphically in Figure 4d.

Insert Figure 4d about here

Nevertheless, this was not a significant interaction. One might argue that, although stressors are associated with both challenge and hindrance appraisals, researchers perhaps selected stress dimensions that have a distinctive characteristic or predominant quality/flavor and, as such, this 'selective strategy' has been better accomplished in the challenge rather than in the hindrance category. This logic follows from the fact that the difference between hindrance stressors' relation to their challenge (B = .50, p = .00) and hindrance appraisals (B = .78, p = .00), at the week level, is much smaller than that between challenge stressors and their challenge (B = .72, p = .00) and hindrance appraisals (B = .26, p = .00) (see Table 7). This obvious "challenge flavor" within challenge dimensions might very well cause the lack of difference among the various stress mindset levels.

Challenge stressors were expected to be positively related to overall hindrance appraisals, a prediction that turned out to be affirmative in direction (positive), not in significance. This was a surprising finding given the consistent positive relationships between challenge stressor dimensions (except job complexity) and challenge stressors combined with their respective hindrance appraisals. As remarked previously, even though challenge and hindrance stressors – as categories of stressors each with four (4) dimensions – were positively related to their

respective challenge and hindrance appraisals, the relationship of the stressor category with the matching appraisal (e.g., challenge stressors → challenge appraisals) was stronger than its relation with the opposite appraisal (e.g., challenge stressors → hindrance appraisals).

The only negative relationship to surface was that between job complexity (i.e., part of the challenge group of dimensions) and its hindrance appraisal. The nonsignificant relationship between challenge stressors and overall hindrance appraisals might be due to that negative relation suppressing the already small positive ones. To test this rationale, I created a challenge stressor variable void of job complexity and two (2) new challenge and hindrance overall appraisals that also excluded job complexity appraisals. I reran the mediational analysis using these new variables in the same manner as before, and the challenge stressor-to-hindrance appraisal link now became positive and significant as predicted (Effect = .07, p = .04, C.I. [.004 .144]). Although such a change in the dimensionality of a stressor might aid in rendering this relationship significant, I felt it was necessary to stick to an existing measure and only present this data as a possible rationale explaining why the original relationship was nonsignificant. In addition, job complexity loaded on the challenge stressor factor which made removing it arbitrary. Another explanation for the nonsignificant association between challenge stressors and overall hindrance appraisals could be found when one notices that the challenge stressors × stress mindset interaction predicts hindrance appraisals, with the moderation being significant and in the predicted direction. Individuals with a high positive stress mindset were expected to report lower hindrance appraisals compared to those with a lower positive stress mindset at higher levels of reported challenge stressors. We do find this pattern with individuals having higher stress mindsets reporting lower hindrance stress appraisals at higher challenge stress levels (Figure 4a). The simple-slope analysis shows that the effects are significant and positive for those having a low-to-moderate positive stress mindset, but not for those having a high one. This high positive stress mindset group seems to show a stable hindrance appraisal of challenge stressors at the various challenge stressor levels and might be causing the entire relationship to become nonsignificant by buffering the positive and significant effects of the group having a lower positive mindset.

Strong evidence indicated that hindrance stressors were positively related to the overall challenge and hindrance appraisals. Challenge stressors were also positively related to challenge appraisals but not to hindrance appraisals. Stress mindset helped explain the latter statistically unsupported relationship by showing that the hindrance appraisals of individuals with a high positive stress mindset tended not to change significantly at various levels of challenge appraisals thus mitigating the overall relationship. For people harboring a low-to-moderate positive stress mindset, challenge stressors were positively related to hindrance appraisals; the lower the stress mindset, the stronger the relationship again corroborating the above mitigation rationale. Simply said, the lower a person's positive stress mindset, the more likely they will appraise a challenge stressor as more hindering compared to someone with a higher positive stress mindset.

6.1.3. The Relationship between Challenge and Hindrance Stress Appraisals and In-Role Performance

It was predicted that challenge stress appraisals would boost performance and that hindrance stress appraisals would be detrimental to it. This prediction was confirmed. Greater challenge appraisals reported by individuals were associated with greater perceived in-role work performance. The opposite occurred for hindrance appraisals, namely that these were related to

lower perceptions of in-role performance. These clear positive and negative relationships, respectively, were not seen when undifferentiated stressors were used to predict performance. In this case, we find a very small negative relationship. Also shown was how including appraisals along with differentiated stressors improved the variance in performance explained by the model compared to one that simply included differentiated stressors. Even though differentiated challenge and hindrance stressors foretold performance positively and negatively, this could have been due to the high correlation between stressors and their 'matching appraisals,' and does not imply that the associations between stressors and their 'opposite appraisals' should be ignored. With the extensive analyses carried out in this thesis, my hope is that researchers will understand this critical point as it is one of the foundational principles in most stress theories. For any reader having doubts about the need to use appraisals and to include both types regardless of which stressor one is referring to, I present the following extra analysis showing how the act of leaving out both appraisals jeopardizes the internal validity of the study and has the power to drastically alter results. A simple regression testing the challenge appraisal-to-performance link shows it to be marginally significant (B = .05, p = .08). When both types of appraisals are included, this relationship becomes significant and the effect size much larger (B = .22, p = .00). Using hindrance appraisals alone negatively and significantly predicted performance (B=-.19, p = .00), but using it in conjunction with challenge appraisals again improved the effect size (B = -.31, p = .00). Therefore, one should remain skeptical about results obtained using a singular appraisal, in particular when it comes to the subject of research validity.

I also predicted that, upon evaluating challenge appraisals, people with a higher positive stress mindset might report higher performance levels compared to those with a lower positive stress mindset. This moderation was not supported. It seems that even individuals with a low positive stress mindset perform well when their challenge stress appraisals are high. This finding is not altogether surprising because challenge appraisals might not include enough adverse characteristics to debilitate the performance of those individuals. These are appraisals of growth opportunities that are subsumed under one's control and therefore might not include aspects that would cause one's performance to fall regardless of one's beliefs about stress. On the other hand, I also hypothesized that a higher level of positive stress mindset would allow individuals to manage higher levels of hindrance stress appraisals compared to those with a lower positive stress mindset. The interaction term for this moderation was marginally significant so, though the hypothesis was not supported using conventional statistical cutoffs, I opted to investigate the matter further (see Figure 5a). Although the results were marginally significant, the data shows preliminary evidence that the higher one's positive mindset is, the more highly they will evaluate their performance as hindrance appraisals become higher compared to those with moderate and low positive stress mindsets. In fact, the simple-slope analyses showed that those having a low positive stress mindset showed the largest negative effect size (Effect = -.33, p = .00, C.I. [-.482 -.181]), followed by those with a moderately positive stress mindset (Effect = -.14, p = .00, C.I. [-.210 -.066]), then those with a high positive stress mindset (Effect = -.11, p = .14, C.I. [-.252 .037]). However, notice again that for individuals with a high positive stress mindset, the effect is nonsignificant. Therefore, it appears as if these individuals may be performing at a more or less stable level despite greater hindrance appraisals compared to those having a low to moderately positive stress mindset.

6.1.4. Simple Mediation, Moderated Mediation, and In-Role Performance

I have proposed a mechanism by which the effects of challenge and hindrance stressors influence in-role performance via stress appraisals. Each stressor has been hypothesized to influence performance through one path mediated by challenge appraisals and another path through hindrance appraisals. With the two mediators in the model, the challenge and hindrance stressors' direct (non-mediated) relationships with in-role performance was still significantly positive and negative, respectively. Three out of the four mediations were significant, except for that of hindrance stress appraisal joining challenge stressors to performance (i.e., challenge stressors → hindrance stress appraisals → in-role performance). At first glance, overall hindrance appraisals do not appear to be a mechanism by which challenge stressors influence in-role performance. This should not be surprising because the challenge stressor-to-hindrance appraisal association was nonsignificant (a finding discussed more below).

I then examined more closely the four indirect effects by taking into consideration the moderation at each side of the mediator (i.e., the moderated moderated mediation). This was done at each of the three (3) moderator levels. Taking stress mindset into account, the indirect effect of challenge stressors on in-role performance through challenge appraisals and that of hindrance stressors on performance through hindrance appraisals were significant at all levels of stress mindset. The indirect effect of hindrance stressors on performance through challenge appraisals was significant at moderate and high levels of positive stress mindset but not at low positive stress mindset. The interesting finding is that, although the indirect effect of challenge stressors on in-role performance via hindrance appraisals was nonsignificant, it was so at low levels of positive stress mindset. In addition, it was negative similar to the effects of hindrance stressors on performance via hindrance appraisals. This can be explained by the fact that the challenge stressor-hindrance appraisal relationship shows the strongest effect at low positive stress mindsets, as does that for the hindrance appraisal-performance relationship. This also points to the necessity of including both types of appraisals and important individual differences in the study of stress-induced workplace outcomes or else one risks missing out on a complete picture of these complex relationships.

6.1.5. The Relationship between Challenge and Hindrance Stress Appraisals and Work Engagement

Knowledge on the link between stress and work engagement lacks clarity to say the least (see the meta-analysis of Crawford et al., 2010), and this thesis attempted to elucidate some confusion. Looking at the findings of this relationship, we observe that undifferentiated stressors failed to predict work engagement. As was the case with in-role performance, the association between challenge and hindrance stressors and work engagement was significantly positive and negative, respectively. Again, using the more proximal challenge and hindrance appraisals, those relationships retained their direction and significance but both the effect sizes and the variance in engagement explained were higher than using merely dichotomized stressors. This is consistent with the logic that runs throughout this thesis and which argues for the comprisal of appraisals in stress research. Findings from the analysis of the links between stressors and work engagement detailed here are additional pieces of evidence for the validity and importance of including stress appraisals when studying stressors and related outcomes. At its core, my analysis shows that individuals who evaluate stressors as more challenging will report their work engagement as being greater than those who appraise the encountered stressors as less challenging. Additionally, individuals who appraise encountered stressors as more hindering will be less engaged than those

with lower hindrance appraisals. An important question pertaining to the generality of these findings across people, however, still hovers in the background: Does a person's stress mindset make a difference in these relationships?

I predicted that stress mindset will moderate a challenge appraisal's positive effect on work engagement, and that individuals with a more positive stress mindset will be more engaged than those with a lower one. This prediction was unsupported but I explored the interaction further as the significance level was approaching marginality (p = .11) (Table 12). This exploratory analysis showed that individuals with a high positive stress mindset reported higher levels of engagement than those with a moderate or low positive stress mindset at all challenge appraisal levels. Second, it also demonstrated that their engagement seemed to be fairly stable even when stressors were appraised as increasingly challenging. Those having low-to-moderate positive stress mindset, although reporting lower levels of engagement than those having a more positive stress mindset, reported significantly greater levels of engagement as they appraised the experienced stressors as more challenging (Figure 5b). It seems that appraising one's work experience as increasingly challenging is more important for improving engagement for those who see stress as more debilitating than those who see it as enhancing. Because challenge appraisals are associated with stressful encounters that one can overcome because of their motivation-inducing features (i.e., challenging when appraised), they will more likely boost engagement for people who anticipate and overestimate the obstacles associated with work experiences (i.e., those with a more stress-is-debilitating mindset) than those who already perceive stress more positively.

I also predicted that a more positive stress mindset will alleviate some of the detrimental influence of hindrance stress appraisals on work engagement. This hypothesis was supported. In fact, individuals possessing a high positive stress mindset reported more engagement at all levels of hindrance appraisals compared to those with moderate and low positive stress mindset. What is more is that the decrease in engagement was most pronounced for those people having the lowest positive stress mindset (Figure 5c). Whenever individuals appraise work experiences as either out of their control or difficult to overcome, their engagement will suffer the most particularly when they hold strong convictions about the destructiveness of stress. While the work engagement of individuals who believe that stress is more enhancing than debilitating also suffered, the effect of such hindering appraisals on engagement was much lower.

6.1.6. Simple Mediation, Moderated Mediation, and Work Engagement

Appraisals were found to constitute a paramount mechanism by which stressors influenced work engagement, and this appraisal apparatus also acted as an important mediating mechanism connecting stressors with in-role performance. Specifically, challenge appraisals mediated the relationships between challenge and hindrance stressors and work engagement. Hindrance appraisals, on the other hand, mediated the effects of hindrance stressors on engagement but not that of challenge stressors. Again, this is not surprising given the nonsignificant challenge stressors to hindrance appraisals relation. When I explored these mediations and took into consideration the moderating role of positive stress mindset, the results were the same in direction and significance except for one case. For individuals low in positive stress mindset, the positive effect of hindrance stressors on work engagement via challenge appraisals was nonsignificant because these individuals – convinced that stress is nefarious and not conducive to one's personal development – saw the least opportunities for growth and success when faced with hindering work environments. As such, the most probable cause for the

nonsignificant mediation of challenge appraisals to the hindrance stressor-work engagement link at that level of mindset is that individuals who appraised hindrance stressors as the least challenging were also those having the lowest positive stress mindset. Once more, these findings not only support the inclusion of both types of appraisals in research involving the effects of stressors on work-related outcomes but also the impetus for the need to take individual differences into account, in particular people's general views about what stress is and how it affects one's goal pursuit and wellbeing.

6.2. Managerial Implications

The first implication this research has for managerial practice is that one should never assume that a stressor falling into one particular category (challenge, hindrance) will be appraised by all employees in a parallel manner. To do so would mean to cast aside not only the importance of the intensity level or magnitude of stressor dimensions (i.e., high, moderate, low) (something I discuss in the next section as well), but also people's range of interpretations for encountered stressful stimuli. For instance, workload, typically categorized as a challenge stressor in the occupational stress literature, may be appraised as challenging and hindering depending on how strenuous it is. Nurses and other healthcare workers during the current COVID-19 pandemic routinely work 12-18-hour shifts and experience a workload that is very different from that of, say, circulation desk clerks in public libraries or security guards in commercial banks. The same could be said about a typical hindrance such as role conflict, widely defined in the organizational behavior literature as an incompatibility in the role expectations needed to accomplish a specific job. Some degree of role conflict, one could argue, helps spur motivation among workers who appraise it as a challenge because it requires them to use a plethora of skills (e.g., role conflict as depicted in the work-family balance literature; Wilson, Baumann, Matta, Ilies, & Kossek, 2018).

That being said, moderate or high levels of role conflict will likely do the opposite, i.e., lead one to decreased wellbeing and the potential for burnout. Managers therefore need to be keenly aware of the specific skillset that members bring to their team, and to understand what job features each member evaluates as growth-inducing and enjoyable as well as goal-thwarting and frustrating. Being able to notice the hindering *and* challenging qualities of a job even if that job is deemed to have challenging *or* hindering characteristics may also be a step in building trust among employees who will feel valued because their interests are considered (McAllister, 1995).

Drawing from the above, the second implication for praxis is that managers must understand that, irrespective of what stressors constitute a job, any stressors appraised as challenges will be positively related to in-role performance and, contrarily, those appraised as hindrances will be negatively related to in-role performance. While this may sound like an unsurprising intuitive finding, the fact remains that the vast majority of empirical work in occupational stress research has focused on stressor-performance linkages without considering the interpretative nature of stressors and the more proximal and critical role that appraisals play in predicting job performance. Together, these findings support the basic principles of goal-setting theory (Locke & Latham, 2002), which advocates that goals become motivational whenever they are challenging among other features like being specific and feedback-informing. Therefore, according to this robust theory, motivation is the main mechanism through which goals lead to desired performance. This suggests that managers ought to rethink how job design elements, i.e., the five core job characteristics (Hackman & Oldham, 1980), could be redesigned in ways that will bring out the most challenging and motivational aspects for a given job.

Third, and building on the momentum of stress mindset research over the last decade (Crum, Jamieson, & Akinola, 2020; McGonigal, 2015), another important managerial consideration rests on the worthwhile idea of changing employees' minds about stress, and making them 'see the good' in stress. The dominant cultural narrative surrounding the way in which people in our society think about stress is that it is pernicious and must be mitigated. Individuals who choose to see the benefits of stress, i.e., those having a positive stress mindset, report the stressors as being less (more) hindering (challenging) in their work and maybe in their lives in general. Thus, having a positive stress mindset is not a result of environmental tranquility (e.g., resource abundance) but rather a more or less stable cognitive individual difference that could be cultivated and shaped through practice (McGonigal, 2015, summarizing the research of Crum and her colleagues). As discussed at length, some good news stemming from this thesis is that stressors typically thought of as hindrances are not appraised as such by all individuals. Another set of important findings from this thesis point to the fact that higher positive stress mindset individuals not only appraised hindrance stressors as more challenging, but also to appraise both challenge and hindrance stressors as less hindering. In other words, those having a positive stress mindset "see" more challenge in the frustrating or debilitating aspects of work and less hindrance, irrespective of whether or not the work is enhancing or debilitating. Which manager, therefore would not wish to have such individuals as part of their team? As scholars, of course, we need to be cautious and aware of potential drawbacks to having what seems at the moment to be a 'silver bullet' in positive stress mindset. To the extent that the latter does not encourage an employee to take on more stress than what their capacity allows, there is no empirical proof at the moment suggesting the pitfalls of having such a mindset. So, how does one change one's stress mindset?

Experts in this area maintain a straightforward and surprisingly non-invasive process in facilitating change in one's stress mindset. One of the first stress mindset interventions carried out by Crum and colleagues took place at the global financial behemoth UBS (Crum et al., 2013; see also Crum et al., 2020). I stress this fact because it directly speaks to managers of organizations, particularly those marked by significant workplace stress, layoff fears, and burnout. Interventions of this sort involve priming workers about how stress could boost resilience (physical and psychological), sharpen one's focus, and enrich interpersonal relationships. Such exposure, while not radically altering one's perception of stress overnight, helps individuals to begin endorsing a more balanced view of stress, one in which they can appreciate its benefits. The key behind the priming, however, is that it triggers a cascade of behavioral changes that linger long after the intervention is complete. Individuals who are subjected to brief interventions that communicate how stress can be if benefit to one's life at work begin to take on a more proactive stance when anticipating stressors. For example, inasmuch as they now accept that stress is an inevitable phenomenon in their lives, they are more likely than their negative stress mindset counterparts to strategically plan for how they will deal with the various sources of stress including seeking information and mentoring. What the interventions have found, therefore, is that employees who once had a negative stress mindset stopped avoiding or denying stress and instead began building their personal resources in order to tackle them head on.

Another intervention approach is to move away from an experimental-like design where employees are randomly assigned to various manipulated treatments, and instead to conduct what are called "open-label mindset interventions" (McGonigal, 2015, p. 29). In this approach, employees are simply asked to join a stress-management training program that starts by

explaining both the beneficial and detrimental aspects of stress and introduces them to the concept of stress mindset. No deception, no hidden agenda: the employees are all explicitly told that the goal of the training program is to help them adopt a more positive stress mindset. But, instead of concluding at this point, the program pushes the employees to cultivate this mindset by asking them to ponder on their unique positive and negative experiences with stress from their recent past. More specifically, they are asked to engage in a three-step process that helps transform their stress by: a) acknowledging or noticing the stress and how it affects one's body; b) welcoming the stress by accepting that its presence signals something that one cares deeply about; and 3) using the energy that stress generates in a more productive way instead of wasting it by ruminating about the stress or engaging in aimless pursuits as a means to escape or avoid the stress (see also Cohen & Sherman, 2014, on the psychology of change).

Finally, practitioners must embrace some of the latest thinking about how they can create organizational cultures that will engage their workforce for the sustainable long term rather than focus on their self-serving interests. I believe that this is imperative, now more than ever before, particularly because of two watershed events that have shaken organizational life globally in the last decade. The first is the financial crisis of 2008, and the second is the ongoing COVID-19 crisis. While the formal one is often framed as an economic crisis whereas the latter as a public health crisis, both events have adversely affected organizational cultures and work engagement across the globe more profoundly that any other environmental factor (for the Crash of 2008, see Bowles & Cooper, 2012; for COVID-19, see Kniffin et al., 2020). In spite of these disruptions, however, experts believe that these tipping points also provide opportunities for organizations to recalibrate their efforts by focusing more on creating cultures that foster employee engagement. As Bowles and Cooper (2012) note:

> "…engagement is not something that an organization can *do to its workforce*. This is a common misunderstanding […] Instead, management responsibility is to *create an environment that is sufficiently attractive to their workers that those people will choose to engage*" (p. 31, italicized by the authors).

The authors go on to suggest ways in which this could materialize. While the environment could be as simple as physical considerations (e.g., lighting, comfort, equipment), they argue that what are more vital to improving work engagement are the psychosocial aspects of work life. In particular, these represent the affective or emotional connections that workers have with their environments. In other words, the workers' collective feelings toward the job should be good enough such that they will want to enact the behaviors needed to stay committed to, and to accomplish their goals within, their organizations. Building a high-engagement work culture necessitates, according to the Bowles and Cooper (2012), organizations to ask themselves three key questions. The first is "who we are" and in answering this question requires one to draw upon the history and values of the organization, its leadership and management, and its employees. The second and third questions are "what we do" and "how we do it," and answers to these require an understanding of structure and processes. Together, each of these five components can be seen as "levers" (p. 93) that could be used effectively to build such a culture (for a detailed list of best practices, see Bowles & Cooper, 2012, pp. 81-119).

6.3. Research Limitations

Although this thesis tried to overcome some of the limitations of previous works discussed at length in the literature review, it remains not without its own limitations. The first involves an assessment of the sampling's demographic composition. One strength here is a much larger sample size than most of the cited papers herein and as such more power and, unlike most of the research in this area which limits itself to either paid participants or nonpaid volunteers, I collected data from both sources as a means to increase the findings' generalizability. Within the sampled cohort, there is also a broad age range (21-74 years old with a mean age of 38 years) and a relatively balanced gender representation (60.2% females). However, one issue includes the sample's restricted ethnic makeup: 90.5% of surveyed participants identified themselves as White. This specific group is slightly higher than what has been reported in workforce distributions in both Canada (77.7%) and the United States (78%) from which the sample was collected (Statistics Canada, 2017; U.S. Department of Labor, Bureau of Labor Statistics, 2018). Part of the data was solicited from the alumni list of a post-secondary institution in the Eastern United States and might account for this fact. In addition, there was an inability to accurately measure response rates from the two separate collected data sources as there was no way to know for certain how many individuals viewed the announcements for the online paid MTurk survey and decided not to participate and how many alumni were initially contacted at the outset when the College's alumni relations office sent the initial inquiry about the research. Neither I nor my contact at the US institution were allowed access to the alumni list or were given access to specific information about the number and demographics of alumni members emailed. In fact, due the importance of culture in how people perceive the world, a cross-cultural examination of the model could be an avenue to follow in the future. Geert Hofstede's work, for example, discusses uncertainty avoidance as being associated with the stress a society experiences in the face of uncertainty (see his work in Venaik & Brewer, 2010). Therefore, how people appraise certain stressors, such as role ambiguity, might be greatly affected by their cultural background.

Second, in an effort to keep the sample size large, I used one daily questionnaire and collected data for five consecutive work days. The upside of this is that it closely follows the ebb and flow of stress and its outcomes during the work experience of individuals in a typical work week. The downside is that five data points were captured per participant. This is not very problematic here per se as I investigate between-person differences and the main objective was to compare individuals based on a snapshot of a typical work experience. However, participants were asked to reflect on their work experience only at the end of each working day. Reflecting on one's experience during the day might not give an accurate image of one's true experiences *throughout* the day; this would be achieved, instead, by collecting multiple measurements each day. This repeated measures design over the course of a day (and over several days) would have been surely better in picking up potentially more valuable data but might also have led to a host of undesirable issues: high dropout rate, respondent fatigue, and most importantly the addition of stressors and stress unrelated to work. For example, typical hindrance stressors are hassles and role overload. Asking participants to answer questions about such stressors, to appraise them, and to evaluate their own job performance and work engagement three times per day might cause both of these stressors to become artificially inflated. In addition, I used a web-based questionnaire that might have precluded some employees from ease of access throughout the day. A future solution to this possibility might be to use smartphone applications that send notifications at scheduled times during the day. Since a large proportion of the population now owns a smartphone, technological access should not be a major concern, albeit some might

refuse to utilize such applications for privacy concerns. A clear example of this is the pushback when it comes to the new COVID alert application that Health Canada launched and was actually not adopted by some provinces. Relatedly, one might tackle the issue of respondent fatigue by reducing the number of questionnaire items in the case of stressors and appraisal measures even though single-item measures are known to be dubious from a reliability standpoint. Finally, one might want to limit the number of stressor dimensions used, i.e., rather than eight as was the case here, use fewer as did Prem et al. (2013). Although one could increase the number of daily sampling instances with a reduction in dimensions (e.g., three in the case of Prem et al., 2013, who used two dimensions), this option has the disadvantage of leading to low content validity for challenge and hindrance stressors, a point that I visit below. Relatedly, a more longitudinal design can help answer questions that have yet to be addressed. For example, how does one's mindset develop and how stable is it? As we experience more and more stressors, some individuals may develop a sort of tool kit to handle stress and, as such, not only see it as benign but also perhaps as challenging. People with grit tend to persevere in the face of adversity (Duckworth, Peterson, Matthews, & Kelly, 2007) and could conceivably develop a more positive stress mindset over time. An interesting thing to note here is that this rationale does not assume that age alone has an effect on how we might see stress but, instead, focuses on the experiences we accumulate into maturity as a decisive factor in how our mindset is constructed. Looking at the interaction of age and life experiences could shed more light on how mindsets develop and how they can be modified.

Third, given the nature of the tested variables in this dissertation (experienced stressors, stress mindset, stress appraisals, work engagement, and perceived in-role performance), I used self-report measures. As such, this issue around relying on such measures should not be problematic as what I am investigating are perceptual constructs that span behavioral, cognitive, and emotional evaluations of one's subjective experiences at work. Some may even argue that objective and subjective measures do not have sufficient convergent validity to allow their interchangeable use, especially when it comes to performance. Moreover, my choice of variable measurement in this research remains consistent with the vast majority of empirical work on the topic. In fact, a meta-analysis about the interchangeability of objective and subjective measures of performance (Bommer, Johnson, Rich, Podsakoff, & MacKenzie, 1995) reports that the two types of measures have a correlation of about .39 indicating that they are related but not identical. Bommer et al. (1995), however, found that if both the target variable and level of the measures are the same – which is the case here with the target being one's general job performance – then there is evidence that they may be used interchangeably (correlation of .71). Perceptions about one's performance and achievement levels have long been at the core of numerous important theories (e.g., self-efficacy and expectancy in learning and motivation). As such, given the nature of the constructs and the challenges associated with collecting objective performance measures anonymously (wherein anonymity shields against social desirability bias), the argument here is not whether or not the measure is valid. I made significant efforts to select valid measures, properly sequence the questionnaire, and ensure utmost anonymity to reduce common method variance. Therefore, the validity of all my measures, even those with the reference shift such as the performance measure, have been shown by its adoption by various authors as I discuss in the Measures section. Rather, what I am trying to convey here is that the reader needs to be cognizant of what is being discussed in this work and not to superimpose my findings on constructs that I did not intend to test. As such, future researchers interested in performance aspects that they doubt or have empirical evidence about their convergent validity

with perceived in-role performance are encouraged to replicate the work to see if the findings are similar. This dissertation, as shown by the recent meta-analysis by Mazzola and Disselhorst (2019), is the first, to my knowledge, that gauges one's perceptions of his or her performance at work which is construct of great importance as I discuss above.

Fourth, and last, I used the 16-item measure developed by Rodell and Judge (2009) which included eight stressor dimensions (four challenge and four hindrance stressors). These dimensions were based on prior conceptualizations of challenge and hindrance stressors (e.g., Cavanaugh et al., 2000; LePine et al., 2005; Podsakoff et al., 2007). Although the list includes stressors that are very common across occupations, it is by no means exhaustive. For example, physical demands, dangerous work conditions, other occupation-specific and general occupational stressors (e.g., work reengineering due the COVID-19 pandemic) are not included in the list. One thing is that fairly likely to happen is that, the more stressor dimensions one adds, the greater the likelihood of participant fatigue and the lower participant response and commitment rates one would get. The measure might therefore not be valid for certain occupations having, for example, high fatality rates (e.g., mining, lumber jacking, and offshore oil rigging). However logical this may be, a quick glance at the bulk of industries in which my sample population reported their work activities, I do not believe this to be cause for much concern. But, the fact remains that the list of stressors used here might not have mapped well to some participants who replied "other" when asked about their industry or to participants in other studies that focus on industries with a unique set of stressors.

6.4. Theoretical Contributions and Future Research Opportunities

This dissertation tried to extend our current state of knowledge regarding the effects of stressors on work outcomes using work engagement and in-role performance as two of these outcomes. I prodded deeper into the challenge-hindrance stress model which has been experiencing a surge of interest currently among researchers. However, one of the themes in this thesis which I have attempted to articulate convincingly is that the challenge-hindrance stress model has some severe limitations. First and foremost, researchers seem to be confusing stressors with stress. For example, they measure workload, hassles, and the number of tasks one has to do, and use those assessments as measures of stress. The mere fact of assuming that stress-inducing environmental and work-related characteristics are valid proxies of stress results in critical validity issues; basically, what one assumes to be measuring is not actually what one is measuring. Stressors induce stress and, although both are related, they are in no way identical. Two individuals experiencing the same stressor might experience entirely difference levels and types of stress.

Second, as it is currently used, the model assumes that certain stressors are purely challenging while others are purely hindering. Again, this assumption fails statistically as both stressor types show good levels of correlation ($r = .50$, $p = .00$) (Table 2). More importantly, though, this assumption contradicts the basic tenets of most stress theories, in particular the transactional theory of stress (Lazarus & Folkman, 1984) on which the model is based as explained at length throughout the thesis.

A third, and related, pitfall concerns the model's blatant neglect of appraisals. The current model makes two faulty assumptions, namely that stressors are either challenging or hindering, and that individuals exposed to these stressors will systematically evaluate and appraise them equivalently (i.e., challenging stressors will be appraised as challenges, and hindering ones as hindrances). This is a far cry from what is argued in Lazarus's (1966) transactional theory of

stress. Stressors can be appraised as *both* challenging and hindering as my analyses show, and in most cases the relationship between the stressor and its appraisals is significant and positive. Even though challenge and hindrance stressors are evaluated overall as challenging and hindering, respectively, Mazzola and Disselhorst (2019) rationalize rather pithily that there may still be a reasonable amount of hindrance "even for the most obvious "challenge" stressors. This creates major methodological issues where the hindrance presented within a challenge stressor (and vice versa) is a confounding variable lowering the expected relationships from the model" (p. 957). Even if the indirect effects of well-chosen challenge and hindrance stressors, via the opposite appraisals, are small due to a small association between the stressor and its opposed appraisal, this is by no means a valid reason to neglect those conceptual links. Not all scholars are keenly interested in work characteristics that are clearly and undoubtedly either challenging or hindering (i.e., "purely" one or the other) (eve though those will most probably be also related to their opposite appraisals). For example, due to the present COVID-19 pandemic, a large number of employees are now forced to telecommute. This change is stressful, but will this new reality of working from one's home be appraised as challenging or hindering? For some, it may be a challenge whereas for others it may be a hindrance. As such, I urge researchers utilizing the challenge-hindrance model of stress to include both types of appraisals for their stressors. The small correlation between stress appraisals (r = .26, p = .00) (Table 2) suggests that appraisals have more discriminant validity than stressors, and the analyses conducted here show that they are better predictors of, at least, the work outcomes of in-role performance and work engagement. Proponents of Hobfoll's (1989) conservation of resources theory might be tempted to assert that 'objective' environmental constraints are more relevant and appropriate in explaining what is at play here compared to Lazarus's (1966) transactional theory of stress which casts the more 'subjective' appraisals in a central role. Before embarking on such a path, however, it might be worthwhile to consider a quote from a scathing critique of Hobfoll's theory by Lazarus (2001b) one year prior to his passing away: "In his [Hobfall's] writings, he constantly denigrates a subjective approach in favor of so-called objective influences, though he obviously is ambivalent about this in that he backtracks from this position by conceding that appraisal is the most successful proximal predictor of stress reactions" (p. 381).

Another contribution is the inclusion of an important personal individual difference that has been overlooked in the challenge-hindrance model of stress, namely stress mindset. I have presented a thorough review of the literature on this model, and have commented on the lack of attention to individual differences compared to other areas of research. With the exception of a few predictions, stress mindset has proven to be a valid moderator of the various associations in my model. This is especially true when it comes to how stress is appraised, albeit evidence is provided here that it could also be used to better comprehend the appraisal-to-outcome relationships. The importance of this construct is that it reflects a metacognitive conceptualization about the nature of stress (Crum et al., 2017) rather than an appraisal of a certain stressor. When preparing for this dissertation, I was surprised that a construct reflecting one's belief about how debilitating or enhancing stress is had not been accounted for in the narrative surrounding the challenge-hindrance stress model. Mazzola and Disselhorst, (2019) suggest that this construct be considered in studying the challenge-hindrance stress model as it could "lead to important and interesting extensions" to the model and that this "would hopefully result in more useful findings" (p. 958). Stress mindset was also able to show that the only insignificant indirect effect in my model became significant and that one significant indirect effect became insignificant at a certain level of mindset. For instance, the mediation involving

hindrance appraisals as a mechanism explaining how challenge stressors contribute to performance was nonsignificant but became significant in the case of individuals having a low positive stress mindset (i.e., challenge stressors → hindrance appraisals → performance). Thus, future researchers should explore stress mindset more as it clearly shows promise in its contributions to the challenge-hindrance model of stress.

Moreover, stress mindset could be related to various coping styles as attested by recent research efforts in this domain. For example Casper, Sonnentag, and Tremmel (2017) studied the effects of stress mindset on the relationship between workload (a challenge stressor investigated here) and its anticipation on coping efforts. They also investigated how coping affected task performance and vigor (i.e., a dimension of work engagement), and found that individuals with a more positive stress mindset 1) made more approach-coping efforts when they expected a higher workload, and 2) those approach-coping efforts were positively related to performance and vigor. This could be a potentially fruitful area of research as coping includes behavioral and cognitive attempts to manage stress (Folkman & Lazarus, 1980; Folkman & Moskowitz, 2004). Coping styles could also be influenced by one's perceptions of the effects of stress being more debilitating or more enhancing and, in turn, influence various work-related outcomes. As I discuss in the literature review, appraisals are classified as primary and secondary appraisals with the latter being less focused on an individual's risk assessment and more on how stress can be coped with (Lazarus & Folkman, 1987). Another avenue worth exploring is to include other personality traits that are closely related to stress. For example, hardiness is a personality dimension associated with more commitment during stressful situations, more perceived control over these situations, and a more positive and challenging perspective when faced with such situations (Kobasa, 1979). While it has been found to be a construct distinct from positive and negative stress mindsets and critiqued to be affirming "the mindset that the debilitating effects of stress must be managed or avoided" (Crum et al., 2013, p. 718), hardiness was found to be more related to personality aspects linked with buffering the adverse effects of stress and negatively correlated with life and work stressors, and with role conflict and ambiguity (see meta-analysis by Eschleman, Bowling, & Alarcon, 2010). As such, I think including hardiness in future research utilizing the challenge-hindrance model of stress could be valuable. Although mindset was instrumental in how stressors were appraised, it played a less potent role in the appraisals' relationship with the outcomes. Perhaps the inclusion of hardiness could improve our understanding of not only the appraisal formation process, but also how individuals react to these appraisals.

Researchers could also more closely inspect the severity or magnitude of the stressor and the appraisal associated with it. Edwards, Franco-Watkins, Cullen, Howell, & Acuff (2014) found that the severity of the stressor influenced not only its evaluation as either hindering or challenging, but also its influence on performance. This is consistent with the reasoning presented here, which contends that challenge stressors are positively related to hindrance appraisals; like hindrance stressors, challenge stressors are also associated with increased strain and, just as much, require resources and energy. Therefore, researchers might wish to investigate at which appraisal level challenge stressors lose their positive impact on the outcomes of interest. In fact, when I was exploring the only negative stressor-appraisal relationship, namely that between job complexity and its hindrance appraisals, I found that at extreme levels of complexity this association became positive (marginal significance), and the positive complexity-to-challenge appraisal link lost its statistical significance and became marginally significant also. It seems that, at extreme levels, even a challenge stressor will fail to be appraised as being

challenging, and will instead be appraised as more hindering. This area of research may be critical in pursuing as blindly increasing challenge stressors – especially in an evermore competitive global business environment – might actually be detrimental especially, but not limited to, individuals having a negative stress mindset or for those who do not use a problem-focused coping style.

Another potential future research avenue worth seeking deals with considering additional types of stressor appraisal categories other than challenges and hindrances. Almost 30 years ago, Lazarus (1991) made a distinction between hindrances and threats, a conceptual differentiation that Tuckey et al. (2015) raised again more recently using empirical evidence. Whereas hindrances impede one's growth and goal-pursuit, threats involve malignant circumstances or demands taking place at work that are intimidating to a person because they are harmful and often lead to personal loss. For example, working conditions have deteriorated for many employees during the current COVID-19 crisis, and these have contributed to an increased rumination about the probability of contracting the virus and, consequently, to a greater risk of job burnout (Kniffin et al., 2020). A stressor such as this one would hardly be considered a hindrance when one fears that one's life is at stake for merely showing up to work – a daily reality for millions of health care workers globally. This example no doubt illustrates a threat. Therefore, future research would benefit greatly by exploring how the collective body of appraisals interact with stress mindset to produce important workplace outcomes.

Lastly, a large body of academic and non-academic work alike has focused on stress reduction. This is no doubt an important topic nowadays given the heightened stressful stimuli experienced worldwide (e.g., economic downturn, pandemic, social and geopolitical upheavals). However, given what we now know about some of the benefits of challenge stress appraisals – keeping the issue of severity in mind – one might wish to regulate stress appraisals and responses. Rather than just seeking endless ways to reduce stress, new ideas are needed in order to optimize one's stress. To this end, the integration of stress mindsets and reappraisals with constructs related to emotions such as emotional regulation, for instance, will spur new interventions whose objective will be to shift a person's evaluation of stress from negative to positive (see Crum et al., 2020). When hindrance stress appraisals are unavoidable, such interventions can be invaluable for both organizational and employee performance and wellbeing.

TABLES

Table 1

Interrater Agreement ($r_{wg(j)}$) and Interrater Reliability (ICC(1) and ICC(2)) Analyses

Variable	Distribution	Mean	SD	Median	ICC(1)	ICC(2)
Performance	Uniform	.92	.17	.98	.23	.78
	Slightly Skewed	.88	.24	.97		
Engagement	Uniform	.88	.20	.95	.37	.88
	Slightly Skewed	.78	.30	.91		
Mindset	Uniform	.96	.11	.98	.74	.97
	Slightly Skewed	.93	.17	.97		
Challenge Stressors	Uniform	.85	.23	.93	.41	.89
	Slightly Skewed	.73	.34	.88		
Hindrance Stressors	Uniform	.88	.18	.93	.52	.93
	Slightly Skewed	.75	.31	.89		
Challenge Appraisal	Uniform	.94	.15	.98	.51	.93
	Slightly Skewed	.86	.26	.96		
Hindrance Appraisal	Uniform	.95	.13	.98	.52	.93
	Slightly Skewed	.88	.24	.96		

Table 2

Descriptive Statistics and Intercorrelations of the Relevant Variables

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	**Age**	**38.00**	**11.80**														
2	**Gender**	**1.61**	**.50**	**.02**													
3	**Challenge Stressors**	**4.40**	**1.09**	**.14****	**.11***	**.86**											
4	**Challenge Appraisals for Challenge Stressors**	**4.32**	**1.09**	**.15****	**.05**	**.72****	**.89**										
5	**Hindrance Appraisals for Challenge Stressors**	**2.87**	**.95**	**.04**	**.23****	**.30****	**.26****	**.89**									
6	**Hindrance Stressors**	**2.98**	**1.04**	**.03**	**.18****	**.50****	**.31****	**.57****	**.81**								
7	**Challenge Appraisals for Hindrance Stressors**	**3.34**	**1.09**	**.17****	**.19****	**.42****	**.70****	**.53****	**.48****	**.88**							
8	**Hindrance Appraisals for Hindrance Stressors**	**3.29**	**1.18**	**.04**	**.18****	**.39****	**.45****	**.76****	**.69****	**.59****	**.90**						
9	**All Stressors**	**3.69**	**.92**	**.10***	**.17****	**.87****	**.60****	**.50****	**.86****	**.52****	**.62****	**.87**					
10	**Challenge Appraisals for All Stressors**	**3.83**	**1.01**	**.17****	**.13****	**.62****	**.92****	**.43****	**.43****	**.92****	**.56****	**.61****	**.92**				
11	**Hindrance Appraisals for All Stressors**	**3.08**	**.10**	**.05**	**.22****	**.37****	**.39****	**.92****	**.68****	**.60****	**.95****	**.60****	**.53****	**.93**			
12	**Stress Mindset**	**3.30**	**1.24**	**-.06**	**-.03**	**.04**	**.19****	**.00**	**.03**	**.26****	**.05**	**.04**	**.24****	**.03**	**.92**		
13	**In-Role Performance**	**5.77**	**.69**	**.06**	**-.08†**	**.08†**	**.18****	**-.33****	**-.26****	**-.03**	**-.20****	**-.10***	**.08†**	**-.27****	**.10***	**.80**	
14	**Work Engagement**	**3.00**	**.83**	**.11***	**-.10***	**.29****	**.38****	**-.27****	**-.19****	**.16****	**-.16****	**.07**	**.29****	**-.22****	**.28****	**.50****	**.93**

Note: N = 487, ** Correlation is significant at the .01 level, * Correlation is significant at the .05 level, † Correlation is significant at the .10 Level. Reliabilities are presented in bold on the diagonal.

Table 3

Correlations between Challenge Stressors Dimensions and Their Respective Challenge and Hindrance Appraisal

Stressor	Day	Appraisal	Mean	SD	Correlation	P-value
Workload	1	Challenge	4.42	1.50	.66**	.00
		Hindrance	2.83	1.32	.17**	.00
	2	Challenge	4.38	1.50	.63**	.00
		Hindrance	2.93	1.40	.15**	.00
	3	Challenge	4.38	1.51	.59**	.00
		Hindrance	2.98	1.41	.08	.09
	4	Challenge	4.28	1.58	.64**	.00
		Hindrance	2.96	1.42	.22**	.00
	5	Challenge	4.27	1.58	.63**	.00
		Hindrance	2.98	1.39	.16**	.00
	5 Days	Challenge	4.35	1.20	.66**	.00
		Hindrance	2.94	1.08	.24**	.00
Time Urgency	1	Challenge	3.85	1.58	.54**	.00
		Hindrance	3.23	1.51	.45**	.00
	2	Challenge	3.76	1.49	.51**	.00
		Hindrance	3.34	1.52	.49**	.00
	3	Challenge	3.83	1.54	.48**	.00
		Hindrance	3.37	1.60	.43**	.00
	4	Challenge	3.83	1.61	.52**	.00
		Hindrance	3.33	1.55	.48**	.00
	5	Challenge	3.82	1.59	.50**	.00
		Hindrance	3.30	1.53	.44**	.00
	5 Days	Challenge	3.82	1.21	.51**	.00
		Hindrance	3.32	1.23	.54**	.00

Stressor	Day	Appraisal	Mean	SD	Correlation	P-value
Job Responsibility	1	Challenge	4.61	1.45	.71**	.00
		Hindrance	2.67	1.22	.05	.30
	2	Challenge	4.40	1.47	.69**	.00
		Hindrance	2.74	1.22	.08	.06
	3	Challenge	4.37	1.47	.70**	.00
		Hindrance	2.79	1.23	.10*	.02
	4	Challenge	4.22	1.49	.69**	.00
		Hindrance	2.84	1.28	.17**	.00
	5	Challenge	4.27	1.52	.68**	.00
		Hindrance	2.78	1.19	.10*	.02
	5 Days	Challenge	4.37	1.23	.77**	.00
		Hindrance	2.76	0.97	.17**	.00
Job Complexity	1	Challenge	4.77	1.58	.67**	.00
		Hindrance	2.41	1.18	-.22**	.00
	2	Challenge	4.81	1.54	.72**	.00
		Hindrance	2.43	1.16	-.22**	.00
	3	Challenge	4.69	1.60	.70**	.00
		Hindrance	2.46	1.21	-.23**	.00
	4	Challenge	4.66	1.58	.69**	.00
		Hindrance	2.54	1.16	-.12**	.01
	5	Challenge	4.68	1.56	.65**	.00
		Hindrance	2.53	1.15	-.13**	.00
	5 Days	Challenge	4.72	1.26	.72**	.00
		Hindrance	2.47	0.93	-.19**	.00

Note: N = 487, ** Correlation is significant at the .01 level, * Correlation is significant at the .05 level.

Table 4

Correlations between Hindrance Stressors Dimensions and Their Respective Challenge and Hindrance Appraisal

Stressor	Day	Appraisal	Mean	SD	Correlation	P-value
Red Tape	1	Challenge	3.06	1.35	.37**	.00
		Hindrance	3.52	1.62	.58**	.00
	2	Challenge	2.99	1.33	.36**	.00
		Hindrance	3.40	1.57	.58**	.00
	3	Challenge	3.10	1.38	.38**	.00
		Hindrance	3.42	1.59	.59**	.00
	4	Challenge	3.01	1.33	.42**	.00
		Hindrance	3.38	1.57	.58**	.00
	5	Challenge	2.97	1.42	.39**	.00
		Hindrance	3.26	1.59	.59**	.00
	5 Days	Challenge	3.02	1.14	.43**	.00
		Hindrance	3.40	1.35	.63**	.00
Role Conflict	1	Challenge	3.66	1.53	.58**	.00
		Hindrance	3.35	1.51	.51**	.00
	2	Challenge	3.46	1.57	.51**	.00
		Hindrance	3.28	1.54	.55**	.00
	3	Challenge	3.46	1.52	.59**	.00
		Hindrance	3.26	1.51	.52**	.00
	4	Challenge	3.46	1.55	.59**	.00
		Hindrance	3.24	1.51	.55**	.00
	5	Challenge	3.42	1.55	.58**	.00
		Hindrance	3.14	1.50	.51**	.00
	5 Days	Challenge	3.49	1.31	.64**	.00
		Hindrance	3.25	1.25	.60**	.00

Stressor	Day	Appraisal	Mean	SD	Correlation	P-value
Role Ambiguity	1	Challenge	3.64	1.36	.12**	.01
		Hindrance	2.94	1.41	.57**	.00
	2	Challenge	3.51	1.33	.01	.87
		Hindrance	3.03	1.46	.55**	.00
	3	Challenge	3.58	1.39	.08	.08
		Hindrance	3.02	1.41	.59**	.00
	4	Challenge	3.54	1.36	.16**	.00
		Hindrance	3.01	1.38	.54**	.00
	5	Challenge	3.52	1.39	.08	.08
		Hindrance	2.98	1.40	.52**	.00
	5 Days	Challenge	3.56	1.12	.11*	.01
		Hindrance	3.00	1.16	.64**	.00
Hassles	1	Challenge	3.41	1.53	.47**	.00
		Hindrance	3.59	1.64	.57**	.00
	2	Challenge	3.29	1.50	.51**	.00
		Hindrance	3.47	1.64	.55**	.00
	3	Challenge	3.25	1.48	.36**	.00
		Hindrance	3.56	1.66	.60**	.00
	4	Challenge	3.26	1.48	.36**	.00
		Hindrance	3.56	1.68	.62**	.00
	5	Challenge	3.25	1.46	.37**	.00
		Hindrance	3.46	1.60	.61**	.00
	5 Days	Challenge	3.29	1.23	.44**	.00
		Hindrance	3.53	1.38	.68**	.00

Note: N = 487, ** Correlation is significant at the .01 level, * Correlation is significant at the .05 level.

Table 5

Correlations between Challenge, Hindrance, and Combined Stressors and Their Respective Challenge and Hindrance Appraisal

Stressor	Day	Appraisal	Mean	SD	Correlation	P-value
Challenge Stressors	1	Challenge	4.42	1.24	.72**	.00
		Hindrance	2.79	1.06	.25**	.00
	2	Challenge	4.34	1.25	.69**	.00
		Hindrance	2.86	1.09	.24**	.00
	3	Challenge	4.32	1.27	.69**	.00
		Hindrance	2.90	1.15	.20**	.00
	4	Challenge	4.25	1.33	.70**	.00
		Hindrance	2.92	1.16	.29**	.00
	5	Challenge	4.26	1.32	.65**	.00
		Hindrance	2.90	1.13	.21**	.00
	5 Days	Challenge	4.32	1.09	.72**	.00
		Hindrance	2.87	0.95	.30**	.00
Hindrance Stressors	1	Challenge	3.44	1.18	.44**	.00
		Hindrance	3.35	1.26	.64**	.00
	2	Challenge	3.31	1.21	.42**	.00
		Hindrance	3.29	1.35	.67**	.00
	3	Challenge	3.35	1.23	.43**	.00
		Hindrance	3.31	1.33	.65**	.00
	4	Challenge	3.32	1.22	.46**	.00
		Hindrance	3.30	1.33	.64**	.00
	5	Challenge	3.29	1.25	.40**	.00
		Hindrance	3.21	1.33	.63**	.00
	5 Days	Challenge	3.34	1.09	.48**	.00
		Hindrance	3.29	1.18	.69**	.00

Stressor	Day	Appraisal	Mean	SD	Correlation	P-value
All Stressors	1	Challenge	3.93	1.08	.62**	.00
		Hindrance	3.07	1.05	.57**	.00
	2	Challenge	3.83	1.11	.58**	.00
		Hindrance	3.08	1.11	.56**	.00
	3	Challenge	3.83	1.12	.57**	.00
		Hindrance	3.11	1.14	.52**	.00
	4	Challenge	3.78	1.16	.59**	.00
		Hindrance	3.11	1.15	.56**	.00
	5	Challenge	3.78	1.16	.55**	.00
		Hindrance	3.05	1.13	.48**	.00
	5 Days	Challenge	3.83	1.01	.61**	.00
		Hindrance	3.08	1.00	.60**	.00

Note: N = 487, ** Correlation is significant at the .01 level, * Correlation is significant at the .05 level.

Table 6

Results of the Multivariate Analyzes of Challenge Stressors Dimensions

Day	Stressor	Appraisal	Effect	SE	t	p-value
1	Workload	Challenge	.63	.03	19.53	.00
		Hindrance	.14	.04	3.80	.00
2		Challenge	.59	.03	17.88	.00
		Hindrance	.13	.04	3.39	.00
3		Challenge	.55	.03	16.20	.00
		Hindrance	.07	.04	1.68	.09
4		Challenge	.59	.03	18.19	.00
		Hindrance	.18	.04	4.85	.00
5		Challenge	.59	.03	17.87	.00
		Hindrance	.13	.04	3.65	.00
1-5		**Challenge**	**.63**	**.03**	**19.28**	**.00**
		Hindrance	**.20**	**.04**	**5.35**	**.00**
1	Job Responsibility	Challenge	.69	.03	22.32	.00
		Hindrance	.04	.04	1.03	.30
2		Challenge	.68	.03	21.06	.00
		Hindrance	.07	.04	1.87	.06
3		Challenge	.69	.03	21.55	.00
		Hindrance	.09	.04	2.30	.02
4		Challenge	.67	.03	21.14	.00
		Hindrance	.14	.04	3.87	.00
5		Challenge	.67	.03	20.38	.00
		Hindrance	.08	.04	2.26	.02
1-5		**Challenge**	**.77**	**.03**	**26.47**	**.00**
		Hindrance	**.14**	**.04**	**3.90**	**.00**

Stressor	Appraisal	Effect	SE	t	p-value
Time Urgency	Challenge	.47	.03	14.00	.00
	Hindrance	.38	.03	11.04	.00
	Challenge	.42	.03	12.96	.00
	Hindrance	.41	.03	12.34	.00
	Challenge	.41	.03	12.19	.00
	Hindrance	.38	.04	10.52	.00
	Challenge	.45	.03	13.38	.00
	Hindrance	.40	.03	11.96	.00
	Challenge	.43	.03	12.69	.00
	Hindrance	.34	.03	10.76	.00
	Challenge	**.42**	**.03**	**13.09**	**.00**
	Hindrance	**.45**	**.03**	**14.18**	**.00**
Job Complexity	Challenge	.71	.04	19.79	0.00
	Hindrance	-.17	.04	-4.90	.00
	Challenge	.72	.03	22.93	.00
	Hindrance	-.17	.03	-4.98	.00
	Challenge	.72	.03	21.53	.00
	Hindrance	-.18	.03	-5.23	.00
	Challenge	.69	.03	21.16	.00
	Hindrance	-.09	.03	-2.69	.01
	Challenge	.66	.04	18.60	.00
	Hindrance	-.10	.03	-2.91	.00
	Challenge	**.73**	**.03**	**23.01**	**.00**
	Hindrance	**-.14**	**.03**	**-4.24**	**.00**

Note: N = 487

Table 7

Results of the Multivariate Analyzes of Hindrance Stressors Dimensions

Day	Stressor	Appraisal	Effect	SE	t	p-value		Stressor	Appraisal	Effect	SE	t	p-value
1	Red Tape	Challenge	.37	.04	8.68	.00		Hassles	Challenge	.43	.04	11.86	.00
		Hindrance	.69	.04	15.60	.00			Hindrance	.55	.04	15.25	.00
2		Challenge	.36	.04	8.62	.00			Challenge	.40	.04	11.05	.00
		Hindrance	.68	.04	15.85	.00			Hindrance	.58	.04	16.00	.00
3		Challenge	.37	.04	9.16	.00			Challenge	.31	.04	8.59	.00
		Hindrance	.66	.04	16.17	.00			Hindrance	.57	.04	16.43	.00
4		Challenge	.40	.04	10.04	.00			Challenge	.31	.04	8.55	.00
		Hindrance	.67	.04	15.85	.00			Hindrance	.60	.04	17.20	.00
5		Challenge	.40	.04	9.26	.00			Challenge	.33	.04	8.83	.00
		Hindrance	.68	.04	16.04	.00			Hindrance	.59	.04	17.15	.00
1-5		**Challenge**	**.43**	**.04**	**10.53**	**.00**			**Challenge**	**.38**	**.04**	**10.76**	**.00**
		Hindrance	**.74**	**.04**	**17.86**	**.00**			**Hindrance**	**.66**	**.03**	**20.27**	**.00**
1	Role Ambiguity	Challenge	.12	.04	2.76	.01		Role Conflict	Challenge	.52	.03	15.54	.00
		Hindrance	.58	.04	15.19	.00			Hindrance	.45	.04	12.94	.00
2		Challenge	.01	.05	0.16	.87			Challenge	.45	.04	12.88	.00
		Hindrance	.61	.04	14.56	.00			Hindrance	.49	.03	14.54	.00
3		Challenge	.08	.05	1.74	.08			Challenge	.50	.03	16.20	.00
		Hindrance	.60	.04	16.10	.00			Hindrance	.44	.03	13.52	.00
4		Challenge	.17	.05	3.61	.00			Challenge	.50	.03	15.87	.00
		Hindrance	.56	.04	13.98	.00			Hindrance	.46	.03	14.41	.00
5		Challenge	.09	.05	1.076	.08			Challenge	.52	.03	15.55	.00
		Hindrance	.39	.05	8.55	.00			Hindrance	.44	.03	12.99	.00
1-5		**Challenge**	**.12**	**.11**	**9.53**	**.00**			**Challenge**	**.57**	**.03**	**18.26**	**.00**
		Hindrance	**.72**	**.04**	**18.56**	**.00**			**Hindrance**	**.51**	**.03**	**16.31**	**.00**

Note: N = 487

Table 7

Results of the Multivariate Analyzes of Challenge, Hindrance, and Combined Stressors

Day	Stressor	Appraisal	Effect	SE	t	p-value
1	Challenge Stressors	Challenge	.72	.03	23.10	.00
		Hindrance	.22	.04	5.78	.00
2		Challenge	.67	.03	20.80	.00
		Hindrance	.21	.04	5.53	.00
3		Challenge	.68	.03	21.00	.00
		Hindrance	.17	.04	4.47	.00
4		Challenge	.67	.03	21.27	.00
		Hindrance	.24	.04	6.60	.00
5		Challenge	.64	.03	18.83	.00
		Hindrance	.18	.04	4.83	.00
1-5		**Challenge**	**.72**	**.03**	**22.57**	**.00**
		Hindrance	**.26**	**.04**	**6.89**	**.00**
1	Hindrance Stressors	Challenge	.65	.04	17.16	.00
		Hindrance	.59	.04	15.17	.00
2		Challenge	.43	.04	10.21	.00
		Hindrance	.76	.04	19.60	.00
3		Challenge	.44	.04	10.55	.00
		Hindrance	.71	.04	18.76	.00
4		Challenge	.47	.04	11.41	.00
		Hindrance	.71	.04	18.36	.00
5		Challenge	.43	.05	9.53	.00
		Hindrance	.71	.04	17.64	.00
1-5		**Challenge**	**.50**	**.04**	**11.96**	**.00**
		Hindrance	**.78**	**.04**	**20.95**	**.00**

Stressor	Appraisal	Effect	SE	t	p-value
All Stressors	Challenge	.65	.04	17.16	.00
	Hindrance	.59	.04	15.17	.00
	Challenge	.61	.04	15.49	.00
	Hindrance	.60	.04	15.00	.00
	Challenge	.60	.04	15.16	.00
	Hindrance	.56	.04	13.40	.00
	Challenge	.62	.04	15.99	.00
	Hindrance	.59	.04	14.94	.00
	Challenge	.60	.04	14.38	.00
	Hindrance	.52	.04	12.06	.00
	Challenge	**.67**	**.04**	**16.81**	**.00**
	Hindrance	**.65**	**.04**	**16.62**	**.00**

Note: N = 487

TABLE 9

Mediation Conditional Process Analysis Results for In-Role Performance

Mediation Conditional Process Analysis for In-role	**Effect (SE)**	***t***	***p***	**95% LLCI**	**95% HLCI**
Outcome: Challenge Stress Appraisal					
Challenge Stressors	.50(.04)	13.25	.00	.424	.572
Hindrance Stressors	.16(.04)	3.98	.00	.079	.234
Outcome: Hindrance Stress Appraisal					
Challenge Stressors	.04(.04)	1.09	.27	-.031	.108
Hindrance Stressors	.63(.04)	17.18	.00	.560	.704
Outcome: In-Role Performance					
Challenge Stress Appraisal	.17(.04)	4.16	.00	.087	.244
Hindrance Stress Appraisal	-.21(.04)	-4.93	.00	-.293	-.126
Challenge Stress	.10(.04)	2.81	.01	.030	.171
Hindrance Stress	-.15(.04)	-3.84	.00	-.234	-.075
Mediation Analyses: In-Role Performance	**Effect (BootSE)**			**Boot LLCI**	**Boot HLCI**
Challenge Stressors→Challenge Appraisal→In-Role Performance	.08(.03)			.030	.140
Challenge Stressors→Hindrance Appraisal→In-Role Performance	-.01(.01)			-.027	.007
Hindrance Stressors→Challenge Appraisal→In-Role Performance	.03(.01)			.006	.057
Hindrance Stressors→Hindrance Appraisal→In-Role Performance	-.13(.03)			-.206	-.069

Note: N = 487. SE = standard error, LLCI = lower level confidence interval, HLCI = higher level confidence interval.

TABLE 10

Moderation Conditional Process Analysis Results for In-Role Performance

Moderation Conditional Process Analysis for In-role Performance	**Effect (SE)**	***t***	***p***	**95% LLCI**	**95% HLCI**
Outcome: Challenge Stress Appraisal					
Challenge Stressors x Mindset Interaction	.02(.03)	.65	.52	-.033	.066
Hindrance Stressors x Mindset Interaction	.07(.03)	2.79	.01	.021	.123
Outcome: Hindrance Stress Appraisal					
Challenge Stressors x Mindset Interaction	-.06(.02)	-2.38	.02	-.107	-.010
Hindrance Stressors x Mindset Interaction	-.10(.03)	-4.17	.00	-.153	-.055
Outcome: In-Role Performance					
Challenge Stressor Appraisal x Mindset Interaction	-.01(.02)	-.22	.83	-.054	.043
Hindrance Stressor Appraisal x Mindset Interaction	.05(.03)	1.72	.09	-.007	.100
Moderated Moderated Mediation Analysis at 3 Levels of Mindset	**Effect (BootSE)**			**Boot LLCI**	**Boot HLCI**
Challenge Stressors→Challenge Appraisal→In-Role Performance					
Low Positive Stress Mindset	.07(.03)			.012	.144
Moderate Positive Stress Mindset	.07(.03)			.018	.129
High Positive Stress Mindset	.07(.03)			.005	.135
Challenge Stressors→Hindrance Appraisal→In-Role Performance					
Low Positive Stress Mindset	-.03(.02)			-.065	-.002
Moderate Positive Stress Mindset	-.01(.01)			-.023	.010
High Positive Stress Mindset	.01(.01)			-.009	.034
Hindrance Stressors→Challenge Appraisal→In-Role Performance					
Low Positive Stress Mindset	.01(.01)			-.004	.045
Moderate Positive Stress Mindset	.02(.01)			.005	.054
High Positive Stress Mindset	.03(.02)			.003	.077
Hindrance Stressors→Hindrance Appraisal→In-Role Performance					
Low Positive Stress Mindset	-.19(.06)			-.312	-.089
Moderate Positive Stress Mindset	-.12(.03)			-.195	-.060
High Positive Stress Mindset	-.07(.03)			-.136	-.014

Note: N = 487. SE = standard error, LLCI = lower level confidence interval, HLCI = higher level confidence interval.

TABLE 11

Mediation Conditional Process Analysis Results for Work Engagement

Mediation Conditional Process Analysis for Work	**Effect (SE)**	***t***	***p***	**95% LLCI**	**95% HLCI**
Outcome: Challenge Stress Appraisal					
Challenge Stressors	.50(.04)	13.25	.00	.424	.572
Hindrance Stressors	.16(.04)	3.98	.00	.079	.234
Outcome: Hindrance Stress Appraisal					
Challenge Stressors	.04(.04)	1.09	.27	-.031	.108
Hindrance Stressors	.63(.04)	17.18	.00	.560	.704
Outcome: Work Engagement					
Challenge Stress Appraisal	.35(.04)	8.20	.00	.266	.433
Hindrance Stress Appraisal	-.32(.05)	-7.05	.00	-.410	-.231
Challenge Stress	.23(.04)	5.98	.00	.154	.305
Hindrance Stress	-.21(.04)	-4.75	.00	-.290	-.120
Mediation Analyses: Work Engagement	**Effect (BootSE)**			**Boot LLCI**	**Boot HLCI**
Challenge Stressors→Challenge Appraisal→Work Engagement	.17(.02)			.127	.230
Challenge Stressors→Hindrance Appraisal→Work Engagement	-.01(.01)			-.040	.011
Hindrance Stressors→Challenge Appraisal→Work Engagement	.05(.02)			.020	.095
Hindrance Stressors→Hindrance Appraisal→Work Engagement	-.20(.03)			-.268	-.141

Note: N = 487. SE = standard error, LLCI = lower level confidence interval, HLCI = higher level confidence interval.

TABLE 12

Moderation Conditional Process Analysis Results for Work Engagement

Moderation Conditional Process Analysis for Work Engagement	**Effect (SE)**	***t***	***p***	**95% LLCI**	**95% HLCI**
Outcome: Challenge Stress Appraisal					
Challenge Stressors x Mindset Interaction	.02(.03)	.65	.52	-.033	.066
Hindrance Stressors x Mindset Interaction	.07(.03)	2.79	.01	.021	.123
Outcome: Hindrance Stress Appraisal					
Challenge Stressors x Mindset Interaction	-.06(.02)	-2.38	.02	-.107	-.010
Hindrance Stressors x Mindset Interaction	-.10(.03)	-4.17	.00	-.153	-.055
Outcome: Work Engagement					
Challenge Stressor Appraisal x Mindset Interaction	-.04(.03)	-1.58	.11	-.091	.010
Hindrance Stressor Appraisal x Mindset Interaction	.08(.03)	2.89	.00	.026	.136
Moderated Moderated Mediation Analysis at 3 Levels of Mindset	**Effect (BootSE)**			**Boot LLCI**	**Boot HLCI**
Challenge Stressors→Challenge Appraisal→Work Engagement					
Low Positive Stress Mindset	.15(.03)			.091	.224
Moderate Positive Stress Mindset	.13(.02)			.087	.184
High Positive Stress Mindset	.11(.03)			.055	.171
Challenge Stressors→Hindrance Appraisal→Work Engagement					
Low Positive Stress Mindset	-.04(.02)			-.086	.001
Moderate Positive Stress Mindset	-.01(.01)			-.032	.013
High Positive Stress Mindset	.01(.01)			-.014	.038
Hindrance Stressors→Challenge Appraisal→Work Engagement					
Low Positive Stress Mindset	.02(.02)			-.015	.067
Moderate Positive Stress Mindset	.04(.01)			.019	.075
High Positive Stress Mindset	.05(.02)			.025	.095
Hindrance Stressors→Hindrance Appraisal→Work Engagement					
Low Positive Stress Mindset	-.29(.05)			-.386	-.207
Moderate Positive Stress Mindset	-.18(.03)			-.240	-.124
High Positive Stress Mindset	-.09(.03)			-.160	-.037

Note: N = 487. SE = standard error, LLCI = lower level confidence interval, HLCI = higher level confidence interval.

Table 13

The Order by which the Hypotheses were Analyzed

Order of Analysis	Hypotheses Tested within the Thesis Manuscript	Support
1	Hypothesis 1: Challenge stressors are positively related to challenge appraisals.	Supported
2	Hypothesis 2: Challenge stressors are positively related to hindrance appraisals.	Not Supported
3	Hypothesis 3: Hindrance stressors are positively related to challenge appraisals.	Supported
4	Hypothesis 4: Hindrance stressors are positively related to hindrance appraisals.	Supported
5	Hypothesis 17: Challenge appraisals are positively related to in-role performance.	Supported
6	Hypothesis 18: Hindrance appraisals are negatively related to in-role performance.	Supported
7	Hypothesis 21: Challenge appraisals will mediate the relationship between challenge stressors and performance.	Supported
8	Hypothesis 24: Hindrance appraisals will mediate the relationship between challenge stressors and performance.	Not Supported
9	Hypothesis 22: Challenge appraisals will mediate the relationship between hindrance stressors and performance.	Supported
10	Hypothesis 23: Hindrance appraisals will mediate the relationship between hindrance stressors and performance.	Supported
11	Hypothesis 5: Stress mindset will moderate the positive relationship between challenge stressors and challenge appraisals such that, for individuals with a more positive mindset, the relationship will be stronger than for individuals with a less positive mindset.	Not Supported
12	Hypothesis 6: Stress mindset will moderate the positive relationship between challenge stressors and hindrance appraisals such that for individuals with a more positive the mindset, the relationship will be weaker than for individuals with a less positive mindset.	Supported

13	Hypothesis 7: Stress mindset will moderate the positive relationship between hindrance stressors and challenge appraisals such that for individuals with a more positive the mindset, the relationship will be stronger than for individuals with a less positive mindset.	Supported
14	Hypothesis 8: Stress mindset will moderate the positive relationship between hindrance stressors and hindrance appraisals such that for individuals with a more positive the mindset, the relationship will be weaker than for individuals with a less positive mindset.	Supported
15	Hypothesis 19: Stress mindset will strengthen the positive relationship between challenge appraisals and performance, such that individuals with a more positive stress mindset will perform at a higher level than those with a less positive stress mindset.	Not Supported
16	Hypothesis 20: Stress mindset will weaken the negative relationship between hindrance appraisals and performance, such that individuals with a more positive stress mindset will perform at a higher level than those with a less positive stress mindset.	Not Supported
17	Hypothesis 9: Challenge appraisals are positively related to work engagement.	Supported
18	Hypothesis 10: Hindrance appraisals are negatively related to work engagement.	Supported
19	Hypothesis 16: Hindrance appraisals will mediate the relationship between challenge stressors and work engagement.	Not Supported
20	Hypothesis 13: Challenge appraisals will mediate the relationship between challenge stressors and work engagement.	Supported
21	Hypothesis 14: Challenge appraisals will mediate the relationship between hindrance stressors and work engagement.	Supported
22	Hypothesis 15: Hindrance appraisals will mediate the relationship between hindrance stressors and work engagement.	Supported
23	Hypothesis 11: Stress mindset will strengthen the positive relationship between challenge appraisals and work engagement, such that individuals with a more positive stress mindset will experience a higher level of work engagement than those with a less positive stress mindset.	Not Supported
24	Hypothesis 12: Stress mindset will weaken the negative relationship between hindrance appraisals and work engagement, such that individuals with a more positive stress mindset will experience a higher level of work engagement than those with a less positive stress mindset.	Supported

FIGURES

Figure 1. Conceptual model.

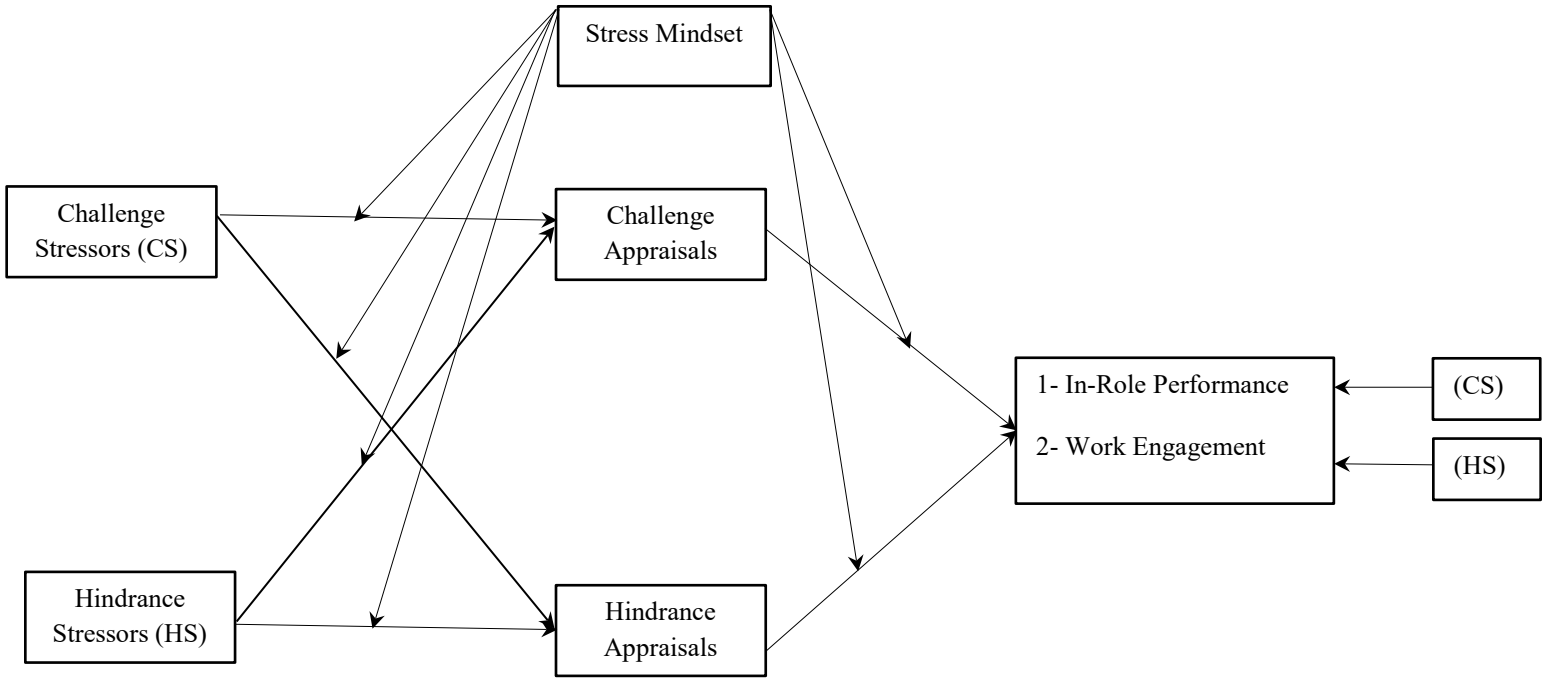


Figure 2. Testing the Dichotomization Rationale

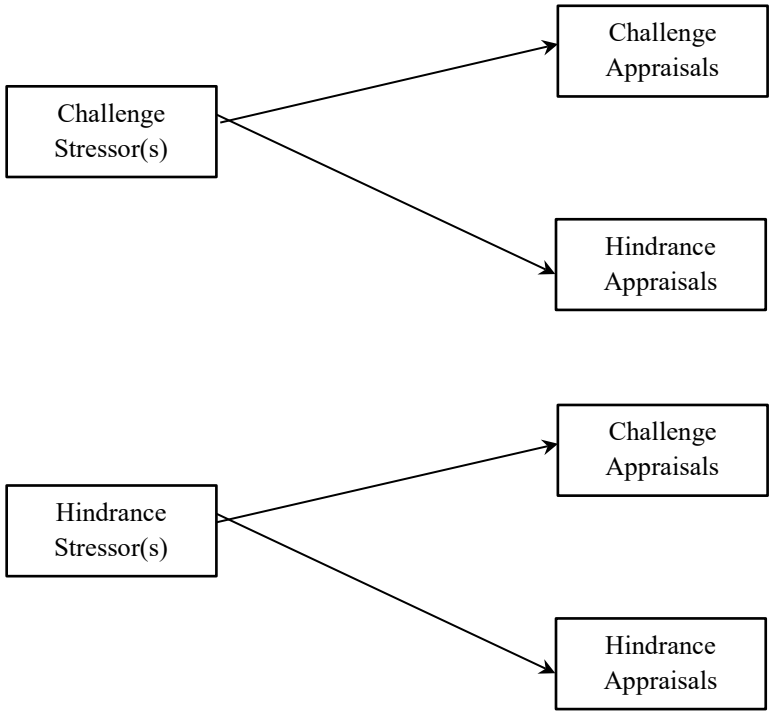


Figure 3. Mediation Analyses

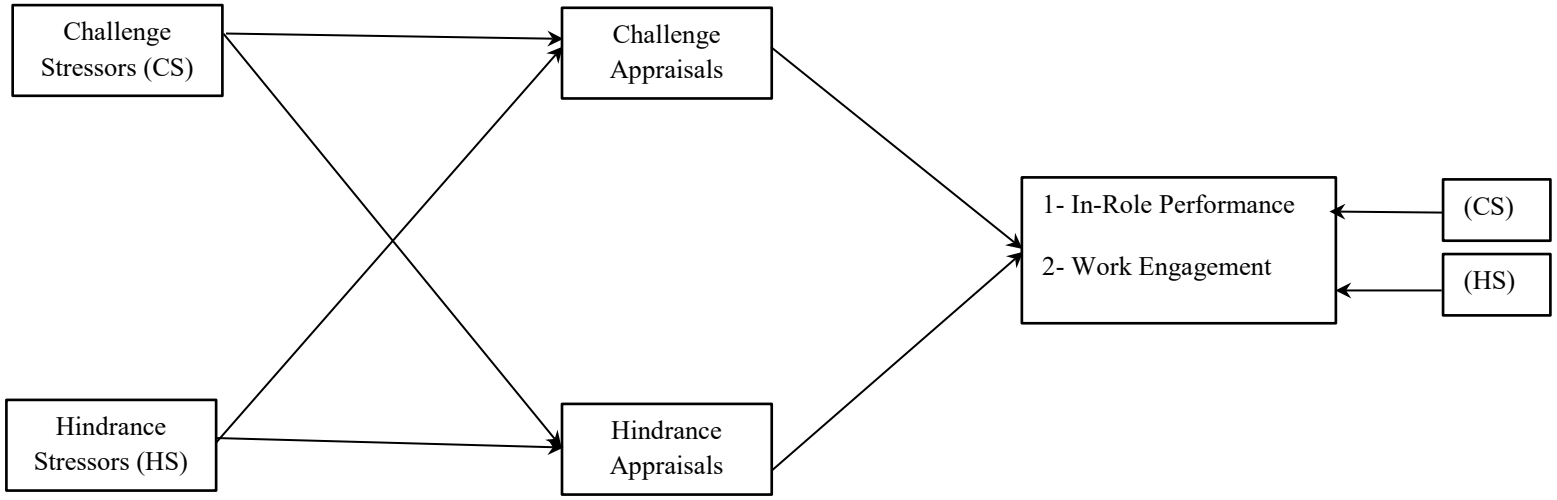
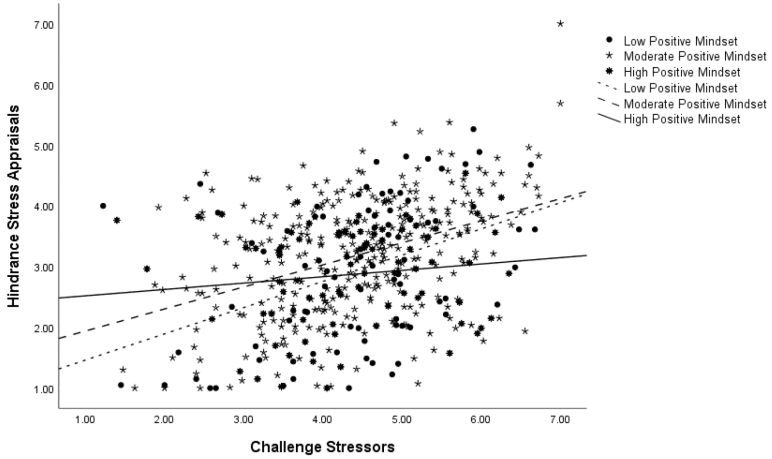
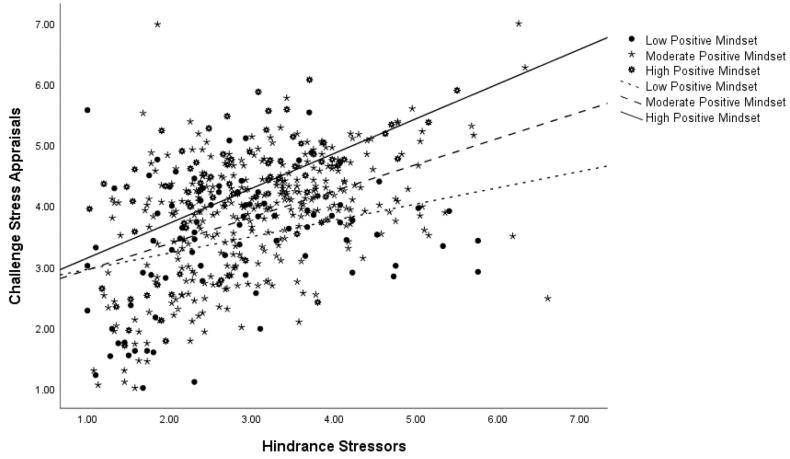


Figure 4: Moderation analyses for the stressor to appraisal relations

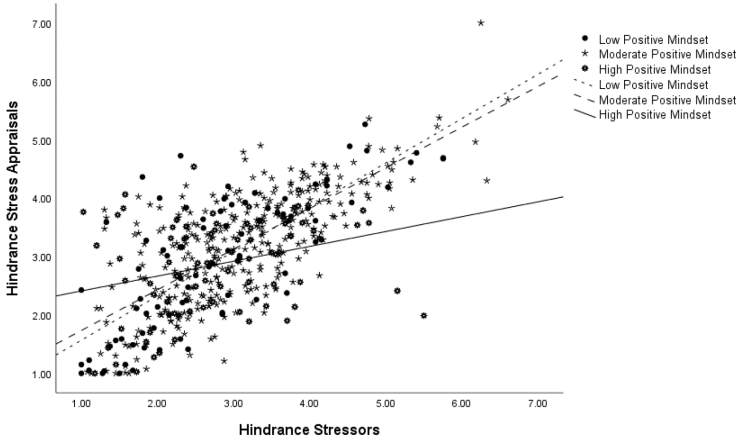
4a Moderation Analysis for the Challenge stressors to Hindrance appraisal relation at 3 levels of Mindset



4b Moderation Analysis for the Hindrance stressors to Challenge appraisal relation at 3 levels of Mindset



4c Moderation Analysis for the Hindrance stressors to Hindrance appraisal relation at 3 levels of Mindset



4d Moderation Analysis for the Challenge stressors to Challenge appraisal relation at 3 levels of Mindset (unsupported)

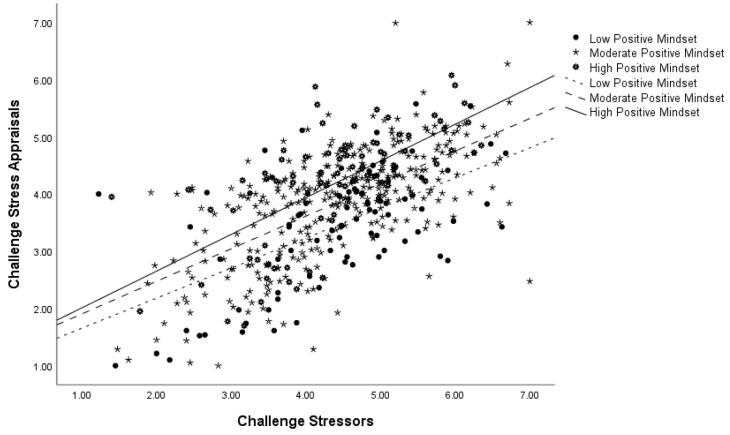
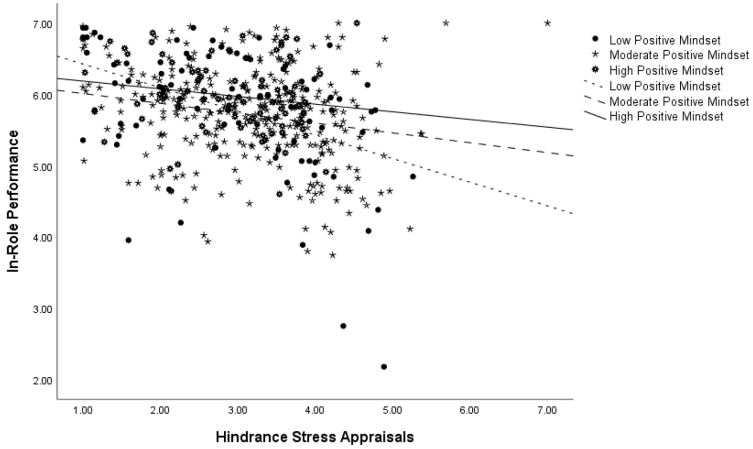
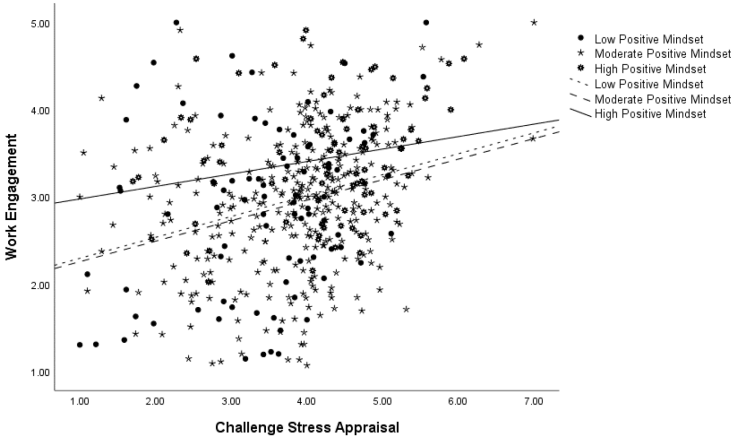


Figure 5: Moderation analyses for the stressor appraisal to outcome relations

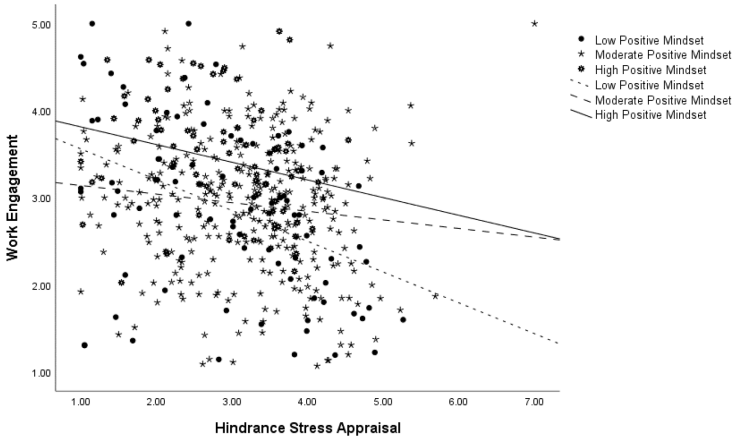
5a Moderation Analysis for the Hindrance appraisal to In-role performance relation at 3 levels of Mindset



5b Moderation Analysis for the Challenge appraisal to Work Engagement relation at 3 levels of Mindset (unsupported)



5c Moderation Analysis for the Hindrance appraisal to Work Engagement relation at 3 levels of Mindset



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APPENDIX A

Consent Forms to Participate

MTurk Participants

You are invited to participate in the research study mentioned above. This form provides information about what participating would mean. Please read it carefully before deciding if you want to participate or not. If there is anything you do not understand, or if you would like to have more information, please ask the researcher.

PURPOSE: The purpose of this research is to gain a wider understanding of how employees experience stress in their daily work. You will be asked questions about yourself and about the stress you encounter at work. Finally, you will report about your work experiences. The ultimate goal of this study is to understand how stress affects workers in order to eventually enable us to deal with it effectively.

PROCEDURES: If you participate, you will be asked to fill out an online questionnaire every day for the next consecutive 5 business days whose focus is on your perceptions of stress at work, as well as outcomes that ensue from such stress. In total, the time requested to complete each questionnaire is around 30 minutes. You should note that you will be filling out similar but much shorter (needing around 8 minutes) questionnaires over the next 4 consecutive business days. As a research participant, your responsibilities would be: to fill out questionnaires about your work experience for 5 consecutive business days as mentioned above.

RISKS AND BENEFITS: There are no foreseeable risks of participation. One benefit of this research is that you will have the opportunity to identify the stressors associated with your work and take the necessary steps to minimize their adverse effects.

CONFIDENTIALITY: We will gather the following information from you: demographic information, personality, and other individual differences measures, and work experience information. We will not allow anyone to access your information, except people directly involved in conducting the research, and except as described in this form. We will only use the information for the purposes of the research described in this form. To verify that the research is being conducted properly, regulatory authorities might examine the information gathered. By participating, you agree to let these authorities have access to the information. The information gathered will be anonymous. That means that it will not be possible to make a link between you and the information you provide once data collection has ended. We will protect your information by saving it on an electronic file which is password protected. Once data collection

is complete, all information will be stored on an external hard disk secured using encrypting software.

CONDITIONS OF PARTICIPATION: You are not obligated to participate in this research; it is purely on a voluntary basis. If you do participate, you can stop at any time. You can also ask that the information you provide not be used, and your decision will be respected. In such instances, you must raise your concern before the end of your data collection period. As a compensatory indemnity for participating in this research, you will, in total and for the all the 5 questionnaires, receive $14 USD ($4 for the first questionnaire and $2.5 for each of the shorter ones). To make sure that research funds are being spent suitably, auditors may have access to a coded list of participants. Again, it will not be possible to identify you from this list. We will inform you should we learn of or suspect anything that could affect your decision to stay in the research. There are no negative consequences for not participating, stopping midway, or asking us not to use your information. Finally, you will not be offered compensation if you are injured in this research. However, you are not waiving any legal right to compensation by signing this form. If at any time I have questions about the proposed research, I can contact the study's Principal Investigator, Raghid Al Hajj Department of Management (raghid.alhajj@concordia.ca)

PARTICIPANT'S DECLARATION: I have read and understood this form. I have had the chance to ask questions and any questions have been answered. I agree to participate in this research under the conditions described. I have carefully studied the above and understand this agreement.

By pressing the button below, I freely consent and voluntarily agree to participate in this study.

I understand and agree to participate

Requirement Form for Volunteers

Dear Ithaca College Alumnus/Alumna,
You have agreed to participate in the work experience study which takes place over the course of five (5) business days.
Below, we are kindly asking that you provide us with an email address in order for us to send you the daily links to the online survey. Please note that all email addresses will be deleted once data collection is complete, and that we will never share your email to any third party.
To be sure that we capture a typical work week experience, we will be giving you four (4) different start dates as options. We ask that you select the date you wish us to send you the first survey link. You will then receive an email on each day prompting you to complete the rest of the survey.
Finally, once data collection is complete which will be sometime in April 2019, you will have the opportunity to receive a $200 Amazon.com gift card.
Thank you very much for your time and effort. We appreciate it.

Please provide us with the email you wish us to use when sending you the daily survey links:

Please reenter this email:

Thank you for agreeing to participate in this study. You can expect to receive the first link on the date you specified above.

Consent Form for Volunteers

CONSENT TO PARTICIPATE IN A STUDY: Dear participant, this is a study on how employees experience stress at work, and it takes place over 5 consecutive days. You will be completing separate surveys on Day 1 and Days 2 to 5. In the surveys, you will be asked to answer questions about yourself and the stress you encounter at work, as well as report about your work experiences. The goal is to better understand how stress affects workers in the hope that it could be dealt with effectively. The survey on Day 1 should take you between 25-35 minutes to complete, whereas the surveys on Days 2 to 5 should take you between 7-9 minutes to complete. Participation in this study is strictly voluntary and you can withdraw at any time. Your anonymous responses will be kept in a file which only the principal investigators will have access to. As such, it will not be possible to make a link between you and the information you provide once data collection has ended. Finally, in exchange for full participation, your email will be added to a draw where you will have the chance to win a $200.00 Amazon.com gift card.
There are no foreseeable risks of participation. One benefit of this research is that you will have the opportunity to identify the stressors associated with your work and take the necessary steps to minimize their adverse effects. To begin, please click the link below. By clicking the link and taking the survey, you acknowledge that you are 18 years of age or older and that you freely consent and voluntarily agree to participate in this study. If you have any questions, please feel free to contact the study's investigator at:

John Vongas, Assistant Professor

Department of Management
Ithaca College School of Business
953 Danby Road
Park Center for Business & Sustainable Enterprise
BUS 428
Ithaca, NY 14850
Tel.: 607-274-3954
Email: jvongas@ithaca.edu

I understand and agree to participate

To be able to match your responses on the 5 days please create any code that is easy to remember. You will need to enter that code every time you fill a questionnaire. You can use any word, number, combination of letters and numbers, etc. as long as it easy for you to remember.

APPENDIX B

Participant Demographic Information

1-What is your age in years?
2- Please indicate your gender:
- Male
- Female
- Other

3- What is your employment status?
- Full-time
- Part-time
- Currently not working

4- How many years have you worked at your current organization?

5- People in Canada and the US come from many racial or cultural groups. You may belong to more than 1 group on the following list (taken from Statistics USA and Statistics Canada). If so, check the group you identify with the most.
- Aboriginal (e.g., North American Indian, Métis or Inuit)
- East Asian (e.g., Chinese, Korean, Japanese, etc.)
- South Asian (e.g., East Indian, Sri Lankan, etc.)
- Black (e.g., Caribbean, African, etc.)
- White (e.g., European, North American, etc.)
- Latin American (e.g., Central American, South American, etc.)
- Southeast Asian (e.g., Vietnamese, Cambodian, etc.)
- Arab (e.g., North African, Middle Eastern, etc.)
- West Asian (e.g., Iranian, Afghan, etc.)
- Other
- I prefer not to answer.

6- What is the highest education level that you have completed?
- Some school years but did not finish high school
- High school completed
- Some Junior College
- Junior College degree completed
- Some Bachelor's
- Bachelor's degree completed
- Some Master's
- Master's degree completed
- Some PhD
- PhD degree completed

7- In what industry is your company located?

- Manufacturing
- Wholesale/retail trade
- Transportation
- Information
- Finance/Insurance
- Real estate
- Professional/Scientific/Technical services
- Education services
- Health care
- Arts/Entertainment/Recreation
- Accommodation/Food services
- Other (specify)

8- On a normal week, how many HOURS do you work in this organization?

9- How large is your organization? Please consider all locations of the company.

- Less than 50 employees
- 50-99 employees
- 100-500 employees
- Over 500 employees

10- English is my ..... language

- First
- Second
- Third
- Fourth

APPENDIX C

Questionnaires for the Model's Variables

1- Perceived In-Role Performance (Goodman & Svyantek, 1999) Long Version (Day 1)

Thinking of your work experience TODAY, read the following items and evaluate how much you agree or disagree with each one.

Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree

Today, I achieved the objectives of my job.
Today, I met the criteria for my performance.
Today, I demonstrated expertise in all job-related tasks.
Today, I fulfilled all the requirements of my job.
Today, I managed more responsibility than I am typically assigned.
Today, I appeared suitable for a higher level role.
Today, I was competent in all areas of my job and handled tasks with proficiency.
Today, I performed well in my overall job by carrying out tasks as expected.
Today, I planned and organized to achieve objectives of my job and meet deadlines.

2- Perceived In-Role Performance (Goodman & Svyantek, 1999) Short Version (Days 2-5)

Thinking of your work experience TODAY, read the following items and evaluate how much you agree or disagree with each one.

Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree

Today, I achieved the objectives of my job.
Today, I fulfilled all the requirements of my job.
Today, I was competent in all areas of my job and handled tasks with proficiency.
Today, I performed well in my overall job by carrying out tasks as expected.

3- Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker, & Salanova, 2006) Long Version (Day 1)

The following statements are about how you felt TODAY at work. Please read each statement carefully and decide how much the statement describes you at your job TODAY.

	Describes me extremely well	Describes me very well	Describes me moderately well	Describes me slightly well	Does not describe me
Today, at my work, I felt bursting with energy.					
Today, I was enthusiastic about my job.					
Today, I felt happy when I was working intensely.					
Today, at my job, I felt strong and vigorous.					
Today, my job inspired me.					
Today, I was immersed in my work.					
When I got up in the morning, I felt like going to work.					
Today, I was proud of the work that I did.					
Today, I got carried away when I was working.					

4- Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker, & Salanova, 2006) Short Version (Days 2-5)

The following statements are about how you felt TODAY at work. Please read each statement carefully and decide how much the statement describes you at your job TODAY.

	Describes me extremely well	Describes me very well	Describes me moderately well	Describes me slightly well	Does not describe me
Today, at my work, I felt bursting with energy.					
Today, I felt happy when I was working intensely.					
Today, at my job, I felt strong and vigorous.					
Today, my job inspired me.					
Today, I was immersed in my work.					
When I got up in the morning, I felt like going to work.					
Today, I was proud of the work that I did.					

5- Stress Mindset Measure-General (SMM-G; Crum et al., 2013).
Rate the extent to which they agree or disagree with the following statements.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

The effects of stress are negative and should be avoided.
Experiencing stress facilitates my learning and growth.
Experiencing stress depletes my health and vitality.
Experiencing stress enhances my performance and productivity.
Experiencing stress inhibits my learning and growth.
Experiencing stress improves my health and vitality.
Experiencing stress debilitates my performance and productivity.
The effects of stress are positive and should be utilized.

6- Challenge and Hindrance Stressors (Rodell & Judge, 2009), Attention Tests, and Challenge and Hindrance Stress Appraisals.

The following set of questions will ask you to evaluate some of your work experiences TODAY. You will be asked to evaluate how much that experience is a challenge experience or a hindrance experience using the following definitions of challenge and hindrance: Challenge experience: Any challenging circumstance that, although potentially stressful, is something you think you can overcome. These circumstances can help you meet your work goals and/or be motivated. Hindrance experience: Any circumstance that interferes with your work and can stand in the way of you being able to achieve your goals. These circumstances seem like a roadblock and almost impossible to overcome.

I have read and understand the requirements

If the situation is something you think you can overcome and/or can help you meet your work goals and/or be motivating, then according to the definition above this is most likely appraised more as a .....than as a .....

a- Hindrance, hindrance
b- Challenge, hindrance
c- Hindrance, challenge
d- Challenge, challenge

The correct answer is:
If the situation is something you think you can overcome and/or can help you meet your work goals and/or be motivating. Then according to the definition above this is most likely appraised to more as a CHALLENGE than as a HINDRANCE
Remember the definitions:
Challenge experience: Any challenging circumstance that, although potentially stressful, is

something you think you can overcome. These circumstances can help you meet your work goals and/or be motivated. **Hindrance experience:** Any circumstance that interferes with your work and can stand in the way of you being able to achieve your goals. These circumstances seem like a roadblock and almost impossible to overcome.
If the situation interferes with your work and can stand in the way of you being able to achieve your goals and/or seems like a roadblock or impossible to overcome, then according to the definition above this is most likely appraised more as a .....than as a .....

a- Hindrance, hindrance
b- Challenge, hindrance
c- Hindrance, challenge
d- Challenge, challenge

The correct answer is:
If the situation interferes with your work and can stand in the way of you being able to achieve your goals and/or seems almost as a road block or impossible to overcome. Then according to the definition above this is most likely appraised to more as a HINDRANCE than as a CHALLENGE.
Remember the definitions:
Challenge experience: Any challenging circumstance that, although potentially stressful, is something you think you can overcome. These circumstances can help you meet your work goals and/or be motivated. **Hindrance experience:** Any circumstance that interferes with your work and can stand in the way of you being able to achieve your goals. These circumstances seem like a roadblock and almost impossible to overcome.

Indicate how much you agree with the following statements TODAY.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

TODAY at work, I've had to work on a large number of projects and/or assignments.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I had to work extra hard to finish my work.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, the volume of work that must be accomplished in the allocated time has been difficult.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I have experienced severe time pressures in my work.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I've felt the amount of responsibility I have at work.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I have been responsible for counseling others and/or helping them solve their problems.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, my job required a lot of skill.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, my job has required me to use a number of complex or high-level skills.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I have had to go through a lot of red tape to get my job done.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, my duties and work objectives have been unclear to me.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I have not fully understood what is expected of me.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I feel there have been clear, planned goals and objectives for my work.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I have received conflicting requests from two or more people.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I have worked with two or more groups who operate quite differently.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I have received assignments without adequate resources and materials to execute them.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.

TODAY, I have had many hassles to go through to get projects/assignments done.

I experienced this as a CHALLENGE.
I experienced this as a HINDRANCE.