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Three Essays on Mental Illness at Work

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Three Essays on Mental Illness at Work

by

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Abstract

Although there is growing interest in mental health from governmental agencies, employees, and workplaces, Follmer and Jones' (2018) call for additional research on mental illness suggests that this area of research remains understudied. This dissertation explores mental illness at work in the context of PTSD, leader mental health, and the impact of occupational depression on planning, activation, and performance. After a short overview of mental illness at work, Chapter 2 explores workplace stressors of post-traumatic stress disorder (PTSD) through a systematic review and meta-analysis of 85 studies, finding that workplace job demands, exposure to violence, sexual harassment, bullying, and injury are all positively related to PTSD symptomology. Additional moderator analysis suggests that the measurement of PTSD and employee occupational group affect the relationship between workplace stressors and PTSD symptoms. Chapter 3 investigates leader mental health, providing a comprehensive review of the 33 articles on leader mental health. Folk beliefs of leadership suggest that leaders should have good mental health: they have high job control, are compensated more, enjoy higher socioeconomic status, less bullying, and less injustice. However, despite these positive work aspects, there are organizational factors that would suggest that leaders should suffer from mental health problems, such as increased demands, higher workload and responsibility, work-family and family-work conflict, and the inability to detach from work. This systematic review suggests that leaders are not immune to mental health problems: they experience burnout, stress, depression, anxiety, mental distress, and sleep problems due to a variety of personal and situational factors. Finally, Chapter 4 tests a multilevel model of planning, exploring the impact of occupational depression and interruptions on planning, activation, and performance, where time management planning and contingent planning lead to activation, occupational depression

and interruptions moderate those relationships, and activation ultimately leads to performance. Using an experiment combined with experience sampling methods, the results suggest slightly different results at the between-person and within-person levels. However, the consistent finding at both levels was that occupational depression moderates the relationship between time management planning and activation, and between contingent planning and activation.

Preface

This thesis is original, unpublished, independent work by the author, Aidan Dumaisnil. The study reported in Chapter 4 was covered by the Ethics Certificate REB21-0300, issued by the University of Calgary Conjoint Faculties Research Ethics Board (CFREB) for the project “An investigation into the effects of planning on mental health” on April 15, 2021.

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Chapter 1:

A Short Overview of Mental Illness at Work and Introduction to the Thesis

Mental illness directly and indirectly affects all Canadians. Approximately 1 in 5 Canadians will experience a mental illness this year: it affects people of all ages, genders, education, income levels, and cultures (Canadian Mental Health Association, 2021). By the age of 40, nearly 50% of Canadians will live or have lived with mental illness in their life (Canadian Mental Health Association, 2021). It is inescapable: even if you personally do not live with a mental illness, your family members, friends, and coworkers likely do.

Just as *physical illness* can refer to a vast number of physical ailments, *mental illness* is a broad term that encompasses a variety of different mental disorders that affect mood, cognition, and behaviour. They are characterized by significant distress and impaired functioning. The Diagnostic and Statistical Manual of Mental Disorders (DSM-V; American Psychiatric Association, 2013), the diagnostic manual for mental illness, categorizes over 200 different disorders, each with their own classification and symptoms. Yet most research in management fails to encompass the variety and complexity of mental illness. In their review of mental illness in the workplace, Follmer and Jones (2018) found that 42 of the 117 articles they reviewed examined mental illness as a general, broad construct: the authors lumped together all disorders, failing to differentiate between specific disorders. However, regardless of disorder, one of the primary characteristics of any mental illness is severe impairment in work or daily life. These disorders affect daily life, but also affect an individual's capability to do their job (American Psychiatric Association [APA], 2013), affecting work performance and productivity, job attitudes, employment barrier perceptions, employment status, and return to work (Follmer & Jones, 2018).

Although there are many risk factors for mental illness, such as genetics, family history, life events, age, and gender, there is growing evidence that aspects of the work environment are also related to an increased risk of mental illness (Follmer & Jones, 2018; Harvey et al., 2017; Stansfeld & Candy, 2006). For example, in their meta-analysis, Stansfeld and Candy (2006) found that all studies exploring the relationship between job demands and mental disorders found that increased job demands were related to increased likelihood of a range of mental disorders. Although the effect size was moderate, the relationship was consistently found, which suggests a potentially harmful relationship between job demands on mental disorders.

More generally, based on the 37 studies Harvey and colleagues (2017) reviewed, they suggest that high job demands, low job control, high effort-reward imbalance, low relational justice, low procedural justice, role stress, bullying and low social support are related to common mental health problems, particularly depression and anxiety. They propose a unifying model of workplace risk factors, with three main factors: imbalanced job design, occupational uncertainty, and lack of value and respect in the workplace which contribute to an increased likelihood of mental health problems, some of which could be classified as mental health disorders.

However, it is unlikely that depression and anxiety are the only mental health issues affecting employees. As I explore in this dissertation, organizational members are also at risk of developing other mental health problems, such as post-traumatic stress disorder (PTSD), burnout, stress, and sleep problems. Moreover, I also examine the potential mental health consequences of leadership. Finally, I examine the effectiveness of a workplace mental health intervention and how self-regulation behaviours enhance mental health, motivation, and performance. Therefore, in this thesis, I conduct three studies that examine different aspects of mental illness and work.

My first study is a systematic review and meta-analysis of post-traumatic stress disorder (PTSD) at work. I first provide a historical perspective of PTSD and a dissection of trauma before examining various workplace stressors of PTSD in the literature, including job demands. Although job demands may not at first appear as a typical traumatic stressor, various theories of PTSD suggest that job demands have the potential to lead to PTSD, as employees experience job demands as threatening stimuli. I meta-analytically synthesize the quantitative research conducted from 85 studies, and offer suggestions for new avenues of research for organizational scholars. In this study, I find that the initial trauma for PTSD may take various forms, including workplace bullying, injury, exposure to violence, sexual harassment, and job demands. Overall, bullying and sexual harassment had the strongest relationships with PTSD; however, the moderator analyses revealed that both PTSD measure and occupation group may influence the relationship between workplace stressors and PTSD. The results suggest that if researchers only examine PTSD within the context of extreme violence and natural disasters, we are doing a disservice to suffering employees who might not fit that stereotype.

My second study explores mental health within the context of leadership. I systematically examine the research on leader mental health to investigate whether leader mental health has truly been ignored, as stated by Barling and Cloutier's (2017) review of the field. Leaders are often assumed to experience positive psychological well-being because of greater job control, greater resources, greater resilience, greater status, and less job stress (Barling & Cloutier, 2017). However, this assumption fails to consider the characteristics of leadership that might negatively impact leaders' mental health, such as greater work demands, responsibility for followers, organizational pressures, and long hours, among other factors (e.g., Hsu et al., 2016; Sharma, 2007; Worrall & Cooper, 1995). I conducted a review of 33 studies investigated mental health in

leaders to explore the predictors of leader mental health, as well as to investigate whether formal leaders have better or worse mental health than employees. This review indicates that leaders suffer from a variety of mental health issues, including burnout, stress, depression, anxiety, mental distress and sleep problems, and that both situational and personal factors appear to affect leader mental health. However, these factors vary greatly and few factors studied easily fall into occupational psychology health models, such as the job demand-control model. Additionally, very little research focused on comparing leaders to non-leaders or considering mental health at different leadership levels. What is clear from this review is that more research is needed to better understand the relationship between leadership and mental health, and as such, I provide an agenda for future research.

My third study is an experimental intervention using an experience sampling methodology to examine the relationship among daily planning, occupational depression, performance, and motivation. This study integrates the motivation literature with work from clinical psychology to better understand how occupational depression and work motivation affect employee job performance. Participants were randomly assigned to one of three conditions: a time management planning condition, a contingent planning condition, and a control group, in order to causally determine the effects of planning. I employed an experience sampling methodology to measure planning, interruptions, activation, and performance daily, for 15 days, as well as occupational depression at five time points. Testing a multilevel model, with effects at both the within-person and between-person levels, I find that the effects of planning, as well as the impact of interruptions, differ between levels. However, the moderating effect of occupational depression is consistent at both levels: occupational depression moderates the relationship between time management planning and activation, and contingent planning and

activation. Adding to the self-regulation and mental health literature, this study confirms that occupational depression impacts self-regulation and activation.

Chapter 2:

Post-Traumatic Stress at Work: A Meta-Analytic Approach

Suffering is an unfortunate reality of the workplace (Dutton et al., 2006). Employees' experiences of abusive supervision, bullying, discrimination and stigma, injury at work, underemployment, and unemployment create profound suffering for employees (Weinhardt & Dumaisnil, 2017). Meta-analytic reviews show these stressors have profound negative effects on employees' mental health (Aronsson et al., 2017; Halbesleben, 2010; Harvey et al., 2017; Theorell et al., 2015) and physical health (Nixon et al., 2011). Stressors such as violence, sexual harassment, accidents, and bullying, which are widely studied in organizational behaviour research, have been identified as potential traumatic events associated with the development of posttraumatic stress disorder (PTSD) in clinical psychology and psychiatry (Kessler et al., 2017). These types of stressors are realities in organizations, and to better understand the consequences these events have on employees, we need to integrate work from clinical psychology with organizational research. Therefore, building on recent advances in PTSD research and integrating work from clinical psychology with organizational research, the current meta-analysis examines the associations between workplace stressors and PTSD. This expands our knowledge of what types of stressors are linked to developing PTSD symptoms and how workplace stressors can contribute to the development of PTSD.

I first define PTSD, examine the diagnostic criteria, symptomology associated with PTSD, and its prevalence. Next, I discuss how the diagnostic criteria of traumatic events has changed over time and provide a theoretical rationale that workplace stressors can be considered traumatic events and risk factors for developing PTSD. I then meta-analyze the relationship between workplace stressors and measures of PTSD and explore moderators of the relationship. Finally, I outline a new research agenda about PTSD from an occupational health perspective.

Therefore, the current review contributes to the literature by providing more insight into the severe consequences the workplace can have on employees' mental health, by expanding the diagnostic criteria of what is considered a traumatic event and providing a research roadmap for the development of future research regarding work and PTSD.

Defining PTSD

PTSD is a general distress disorder, characterized by pervasive emotional distress (Marshall et al., 2019) and is caused by a person experiencing or witnessing an extreme stressor. PTSD is one of the only disorders that explicitly requires an external event as a catalyst, and cannot occur without that external event (APA, 2013). PTSD is characterized by the presence of three main symptoms: re-experiencing, avoidance, and arousal (APA, 2013). Individuals with PTSD can re-experience the initial trauma when triggered by specific events. This, in turn, can cause symptoms of intense feelings of fear and helplessness. Individuals with PTSD also begin avoiding specific places, sights or sounds, including news reports that may involve aspects of the initial trauma. Additionally, these individuals may avoid activities that they once enjoyed, including work tasks. Individuals with PTSD are constantly alert and experience heightened states of arousal, may have difficulty sleeping or concentrating, and may experience outbursts of anger, possibly affecting work performance and interpersonal relationships (Yehuda, 2002).

Regarding lifetime prevalence, almost 5% of the United States (U.S.) population, or 15.3 million people, currently lives with PTSD, and 6.1% (19.9 million people) will suffer from PTSD at some point in their life (Goldstein et al., 2016). Even more striking, the prevalence rate among first-responders can be nearly four times higher than this: on average, prevalence among police is 8.3%, firefighter prevalence is 17.4%, and emergency medical prevalence is 14.1% (Perrin et al., 2007; Skogstad et al., 2013). In addition, professions such as health care

workers and journalists, have been shown to have higher rates of PTSD than other comparable jobs (Skogstad et al., 2013).

A Historical Perspective on PTSD

The study of PTSD has gone through many iterations over time. Many of the early theoretical frameworks inspired by psychoanalysis proposed an incomplete view of PTSD that has failed to hold up to criticisms (Bisson, 2009). However, the study of PTSD gained more scientific validity with the adoption of behavioural, emotional, and cognitive approaches to studying PTSD. Mowrer's (1960) two-factor theory or avoidance learning was the first behavioural theory of PTSD, in which fear is a conditioned response to a stimulus. The notion of a conditioned stimulus and response stems from Pavlov's (1927) work on classical conditioning. Behavioural theories of PTSD suggest that PTSD symptoms arise when external neutral stimuli become associated with the traumatic event and become conditioned stimuli. These newly conditioned stimuli invoke the PTSD conditioned response (Keane & Kaloupek, 1982; Kilpatrick et al., 1985). In other words, multiple cues, even if they were not originally associated with the traumatic experience, can become associated with the traumatic experience, and can trigger a conditioned fear response. In normal stimulus-response situations, repeated exposure diminishes the effect, eventually resulting in extinction. However, in the case of PTSD, because of the wide range of newly conditioned stimuli, extinction is not achieved. Rather, the fear response is strengthened with every stimulus interaction, contributing to developing and sustaining PTSD symptoms (Levis & Boyd, 1979). For example, soldiers who return from the battlefield with PTSD can experience fireworks as a stressful ordeal. The sudden, loud and unexpected noises, often under the cover of darkness, can be reminiscent of war, triggering flashbacks and hyperarousal, leading to fear and anger responses.

Over time, emotional and cognitive elements were explored to better understand the psychological processes involved in the development and experience of PTSD (Green et al., 2017; Foa & Kozak, 1986; Van Elzakker et al., 2014). Emotional models of PTSD suggest that maladaptive cognitive schemas result in PTSD. Traumatic events are encoded into memory as a fear network of interconnected points of trauma-related information. The fear network includes information about the traumatic event, information about cognitive, behavioural, affective, and physiological reactions to the event, which provides interpretive information about the meaning of the event. When the original traumatic event is encoded in memory, it is difficult to process. As the event is uncontrollable and unpredictable, information processing falters, causing problems in accessing mental fear networks and results in disruptions of attention and memory, culminating in fragmented memories (Foa & Kozak, 1986; Foa et al., 1992). Additionally, the maladaptive fear structures interfere with how stimuli are assessed: for example, stimuli that would otherwise be assessed as nonthreatening become associated with threat and an elevated fear response. Further, individuals with PTSD are more likely to focus on trauma-related stimuli, displaying attentional bias and thus affecting the processing of other information (Constans et al., 2004). When the fear network is triggered through some reminder of the traumatic event, information intrudes on the individual's consciousness. Although emotional processing models led to a new understanding of the processes involved regarding the experience of PTSD, they failed to sufficiently account for PTSD symptoms such as nightmares and flashbacks (Green et al., 2017).

Cognitive models of PTSD were designed to address these inconsistencies and ambiguities in the behavioural and emotional processing approaches. These models are based on the notion that the traumatic event provides new information that is incompatible with pre-

existing beliefs. As individuals appraise the traumatic situation, the appraisal does not integrate with their existing beliefs (Green et al., 2017). Thus, PTSD arises because of the individual's unsuccessful attempt to integrate that information. Ehlers and Clark (2000) present a cognitive model of PTSD in which the traumatic event is separate from the meaning attributed to the event. In other words, the appraisal of the event is what determines the PTSD response. If individuals interpret their traumatic event in a way that results in the perception of a serious current threat, PTSD is more likely to occur and become persistent. Negative interpretations of the trauma cause negative emotions and motivate individuals to engage in strategies to reduce the perceived threat and distress. However, as the current perceived threats are misinterpreted, the elevated response becomes dysfunctional, resulting in PTSD.

The cognitive model of PTSD (Ehlers & Clarke, 2000) focuses on maladaptive appraisals. An individual with PTSD is unable to determine whether the threat experienced is ongoing or in the past: they are unable to see the traumatic experience as a time-limited event. Thus, all threats are perceived as current, leading to an increased state of heightened arousal. Additionally, the individual might overestimate the risk and prevalence of a threat, leading to dysfunctional strategies, such as withdrawal and avoidance. The perceived ongoing threats can lead to an inability to manage stressful situations and view the world as a dangerous place. Therefore, Ehlers and Clark's (2000) cognitive model of PTSD offer a theoretical explanation for persistent PTSD symptomology and has been empirically supported (Dunmore, Clark & Ehlers, 2001; Ehlers et al., 1998).

Despite the variety of theories on PTSD – from behavioural to cognitive – these theories all focus on how the traumatic event leads to PTSD. The traumatic nature of the event is taken as a given; none of the theories specifically describe the traumatic event itself, nor

what defines an event as traumatic. This difficulty in defining trauma is the basis for one of the key debates on PTSD and is important for establishing the connection between workplace stressors and the development of PTSD.

A Historical Perspective on Trauma in Relation to PTSD

Determining which events are considered to be traumatic, and thus should be associated with PTSD, has been source of debate among clinicians and researchers. Despite trauma being a necessary precursor to PTSD, there is no generally accepted definition of trauma (Mueser et al., 2001). The event itself is not what determines whether it will be considered a traumatic event or not; rather, the traumatic nature of an event is based on an individual's perception of the event (Dulmus & Hilarski, 2003). Therefore, what determines an event's traumatic nature are the specific attributions that an individual makes and the specific psychological structures that form because of these attributions (Dulmus, 2003), making the definition of trauma rather elusive.

In a global study with data from 24 countries and nearly 69,000 respondents, 70% of respondents experienced traumatic events in their lifetime and that the average number of traumatic events experienced was 3.2 events (Kessler et al., 2017). The trauma criterion was broken down into: war, violence, accidents, sexual, death of a loved one, or witnessing these traumas. Interestingly, traumas associated with intimate partner violence had the strongest association with PTSD. Moreover, the experience of any trauma was associated with on average PTSD duration of 72 months (6 years). Furthermore, the "other trauma category," which was unspecified and respondents wrote in details of their trauma, was associated with a similar risk of PTSD and duration of PTSD as other types of traumas, with the exception of sexual trauma, which was higher.

These findings highlight the importance of examining the trauma criterion and its relationship to PTSD, because an individual's experience of what they consider trauma, regardless of what the literature determines, is associated with the development and duration of PTSD symptoms. In the clinical psychology literature, the traumatic event is known as Criterion A or the stressor criterion. With each revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM), the nature of Criterion A has changed (see Table 1), sometimes quite drastically (North et al., 2016; Weathers & Keane, 2007). Even PTSD's first appearance in the DSM was fraught with controversy: its initial inclusion was based on the decision of men who admitted that they were ignorant of the research on trauma but felt no need to investigate it (Herman, 2015).

Table 1

PTSD Criterion A Changes Throughout DSM Revisions

DSM Version	Disorder Class	Criterion A Trauma Definition
DSM-III (1980)	Anxiety Disorders	A. Existence of a recognizable stressor that would evoke significant symptoms of distress in almost everyone.
DSM-III-R (1987)	Anxiety Disorders	A. The person has experienced an event that is outside the range of usual human experience and that would be markedly distressing to almost anyone, e.g., serious threat to one's life or physical integrity; serious threat or harm to one's children, spouse, or other close relatives and friends; sudden destruction of one's home or community; or seeing another person who has recently been, or is being, seriously injured or killed as the result of an accident or physical violence.
DSM-IV (1994) and DSM-IV-TR (2000)	Anxiety Disorders	A. The person has been exposed to a traumatic event in which both of the following were present: 1. The person experienced, witnessed or was confronted with an event or events that involved

		actual or threatened death or serious injury, or a threat to the physical integrity of self or others. 2. The person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behaviour.
DSM-V (2013)	Trauma and Stressor-Related Disorders	A. Exposure to actual or threatened death, serious injury, or sexual violence in one or more of the following ways: 1. Directly experiencing the traumatic event(s). 2. Witnessing, in person, the event(s) as it occurred to others, especially primary caregivers. 3. Learning that the traumatic event(s) occurred to a parent or caregiving figure. Note: Witnessing does not include events that are witnessed only in electronic media, television, movies, or pictures.

Over time, there has been considerable debate and change regarding diagnosing PTSD and what defines a traumatic event. With its inception in the DSM-III in 1980, a PTSD diagnosis required the traumatic stressor to be a recognizable stressor that would evoke significant symptoms of distress in almost everyone, such as a natural disaster, car accident, rape, assault, or military combat. It could not be simple bereavement, chronic illness, business loss, or marital conflict (APA, 1980). The 1987 revision updated the definition of the stressor criterion to be an intense life-threatening event outside the range of normal experience, involving serious threat to life or physical integrity (APA, 1987). With the revisions to the manual in the DSM-IV and DSM-IV-TR (APA, 1994, 2000), Criterion A was relaxed. The traumatic event no longer had to be outside the range of normal experiences and witnessing or being confronted with events that threatened serious injury was sufficient to be considered a traumatic experience. Even learning of traumatic exposure to family members or close friends represented an appropriate traumatic

experience. In addition, the APA noted, as a part of Criterion A, the person must experience intense fear, helplessness, or horror. This greatly opened the criterion, as being diagnosed with a life-threatening illness, witnessing assault war or disaster, unexpectedly witnessing a dead body or body parts, the violent assault, injury or accident of a close relative or friend, and the life-threatening disease of one's child were now considered to be traumatic events.

In the latest edition, the DSM-V re-classified PTSD from an anxiety disorder to a trauma and stressor-related disorder. This new edition also removed the emotional reactions (i.e., fear, helplessness, or horror) from Criterion A. This changed the nature of PTSD, as it no longer mandated that a person respond with intense fear, helplessness, or horror. Rather, in the DSM-V, the traumatic event had to include exposure to actual or threatened death, serious injury, or sexual violence, through either directly experiencing the event, witnessing, in person, the event, or learning that the traumatic event occurred to a parent or caregiver (APA, 2013). Thus, even if a person did not have a strong negative emotional response to a trauma but either witnessed or experienced that trauma, they would be considered to have experienced a traumatic event meeting the criteria for PTSD.

In response to continual changes in the definition of what is a traumatic event, Brewin and colleagues (2009) suggested completely abolishing Criterion A and instead focusing on core symptoms. This fits with a larger movement in clinical psychology research to take a symptomatic approach to studying and treating psychological disorders (Borsboom, 2017). Brewin and colleagues suggest that identifying the traumatic event, necessary for Criterion A, is not only incredibly difficult, but undesirable. And given that PTSD symptoms rarely occur without some traumatic event, Criterion A simply helps describe the context around PTSD, rather than assisting with diagnosis. Moreover, the emergence, presentation, and duration of

PTSD is heterogeneous both in psychological presentation but also neurologically (Garfinkel & Liberzon, 2009; Suvak & Barrett, 2011). For example, Roberts and colleagues (2012) examined over 3000 female nurses, half with probable PTSD and half without, based on Breslau's PTSD screen (Breslau et al., 1999). The authors found that PTSD did not vary with the type of traumatic event. Events not deemed to be traumatic under the DSM's guidelines still produced PTSD symptoms as significant and impactful as DSM-approved traumatic events. They concluded that "the stressor Criterion A1 did not seem to matter for PTSD phenomenology" (p. 7). Additionally, Alessi and colleagues (2013) found that people who experienced a non-Criterion A1 event, such as homelessness, unemployment, or ending a relationship, were more likely to have PTSD symptoms that those who experienced a Criterion A1 event, which involves actual or threatened death or serious injury, or a threat to the physical integrity of self or others. Relaxing the Criterion A1 definition led to a higher prevalence of PTSD (Alessi et al, 2013), as well as increasing predictive validity (Kira et al., 2019).

Conversely, some researchers criticize Criterion A for being too inclusive and propose either tightening the definition or leaving it as is (Kilpatrick et al., 2009; McNally, 2007; Rosen et al., 2008; Spitzer et al., 2007). In contrast with Alessi and colleagues' (2013) results, Larsen and Pacella (2016) found that when people experienced a traumatic event as defined by Criterion A1, PTSD symptoms were greater than when people experienced a non-Criterion A1 event. Additionally, Kilpatrick and colleagues' (2009) suggest that abolishing the criterion is not represented by the research, and the debate over which events can and cannot produce PTSD is not productive to furthering our knowledge of PTSD. Going even further, Spitzer and colleagues (2007) suggest tightening the definition of Criterion A so that it focuses only on directly experienced events (thus, removing the possibility for indirect events to act as a traumatic

stressor). Further critics have pointed to the conceptual bracket creep (McNally, 2006, 2009), where ordinary stressors are deemed as possible to produce PTSD. McNally is particularly concerned that if Criterion A is broadened, it not only threatens our understanding of PTSD, but also distances the causal burden of the stressor, and leads to an over-medicalization of normal emotional responses.

As can be seen there has been considerable debate and refinement about what trauma is and how and why certain traumas are considered a precursor for the development of PTSD. Therefore, a balance needs to be struck between expanding the criterion space too much such that any stressor is considered traumatic such as negative feedback, and limiting the criterion space so much that workplace bullying is not considered. Therefore, in this meta-analytic review, the workplace stressors examined were chosen to be aligned with clinical psychological research on PTSD generally and work on expanding or retracting the scope of Criterion A specifically.

Can Workplace Stressors be Considered Traumatic?

Although work can have a variety of positive benefits for mental health, various aspects of the work environment can adversely impact mental health (e.g., Harvey et al., 2017; Stansfeld & Candy, 2006), and even contribute to mental illness such as PTSD. As Williams and Williams (2020) suggest, PTSD is "more enduring and life-affecting…than what is normally addressed in research on stress in organizations" (p. 24). PTSD's Criterion A situates trauma as death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, either directly or indirectly. The workplace is not immune from such trauma. Employees experience stressors such as sexual harassment, bullying, injury, and violence (Tehrani, 2004; Williams & Williams, 2020). Tehrani (2004) proposes four types of traumatic events found in organizations that can lead to PTSD: operational traumatic events (including exposure to a

biological hazard, carcinogen, or noxious fumes, destruction of workplace, institutionalized victimization, and community opposition to project), criminal traumatic events (including bomb threats, mugging, blackmail, and violent attacks or threats), interpersonal traumatic events (including death or suicide of a colleague, witnessing a colleague being injured, exposure to a violent strike, bullying, and victimization and verbal abuse), and injury traumatic events (including vehicle crashes, equipment failure or misuse, small-scale fires, and lifting and handling).

Although Tehrani (2004) and Williams and Williams (2020) propose that stressors such as bullying, violence, injury, and sexual harassment are likely workplace stressors that can be considered traumatic and should be considered as Criterion A traumatic events, their reviews fail to examine quantitatively the relationship between workplace stressors and PTSD. Further, they do not consider job demands as a potential traumatic event which could be a risk factor for the development of PTSD. Meta-analytic reviews on job demands show that increased job demands are linked to burnout and common mental disorders (e.g., Crawford et al., 2010; Stansfeld & Candy, 2006). Therefore, in addition to investigating workplace stressors that have conceptual overlap with traumatic events often linked to PTSD in the clinical literature, I propose and justify that job demands should be also investigated as a potential traumatic event that can lead to the development of PTSD.

Workplace Stressors

Job Demands

Job demands are common work stressors that relate to mental ill health (Dalgard et al., 2009; Demerouti et al., 2001; Karasek, 1979; Stansfeld & Candy, 2006). Karasek's (1979) seminal work on job demands suggests that high psychological job demands are related to

increased exhaustion and depression, highlighting how the work environment can have consequences for employee mental health. In terms of perseverance, Dalgard et al.'s (2009) longitudinal study found that the combination of high job demands, and low job control, contribute to increased psychological distress 11 years later. They suggest that job demands, and psychological distress have a reciprocal relationship, in which high psychological distress predicts later job demands. In their meta-analysis, Stansfeld and Candy (2006) reviewed eight articles on job demands and common mental disorders (neurotic disorders, depressive disorders, anxiety disorders, and other mood disorders). Psychological job demands were positively associated with common mental disorders across all studies, although there was a high degree of heterogeneity in the results. Overall, it appears that job demands place stress on employees, make it more difficult for them to achieve their tasks, and can damage their mental health.

Although job demands may not at first appear as a typical traumatic stressor, the various theories of PTSD suggest that job demands have the potential to lead to PTSD. Employees may experience job demands as a threat. Job demands can be appraised negatively (Schaufeli & Taris, 2014), particularly if the demands become a hindrance rather than a challenge (Crawford et al., 2010). If the negative appraisal becomes maladaptive and the employee is unable to see past the job demands, viewing them as a current threat, it can lead to an increased state of heightened arousal, and an inability to manage stressful situations, leading to potential PTSD. Lavoie and colleagues (2011) suggest than employees' work context, including job demands, can have significant implications for PTSD. The work context becomes the source of stress, leading to avoidance and hyperarousal, both of which are core characteristics of PTSD.

Overall, high job demands can have serious consequences for employee mental health, such as increased depression (Karasek, 1979), burnout (Demerouti et al., 2001), psychological

distress (Dalgard et al., 2009), and an increased risk of common mental disorders (Stansfeld & Candy, 2006). Additionally, if these demands are appraised negatively, they can also lead to PTSD symptoms. Despite not fitting into Criterion A's definition of trauma, job demands' potential to lead to PTSD symptoms makes it necessary to include job demands as a potentially traumatic workplace stressor.

Injury at Work

Injury at work is characterized by a broad set of occupational incidents. Injuries may be severe, such as extreme physical harm, as well as less severe, non-life-threatening injuries (Ghisi et al., 2013). Workers who experienced workplace injury trauma report ongoing flashbacks, nightmares, avoidance, and depression (MacDonald et al., 2003). Grunert and colleagues (1990; 1992) investigated posttraumatic reactions in individuals suffering from traumatic hand injury. Flashbacks, nightmares, avoidance and fear of injury or death were prevalent even 18 months after the initial injury (Grunert et al., 1992; Grunert et al., 1990). Further, Asmundson and colleagues (1998) found that 34.7% of workers injured at work met the full criteria for PTSD, and 18.2% met the criteria for partial PTSD. Additionally, individuals in a high-stress exposure scenario, such as a narrow escape, reported more PTSD symptoms than those in less-stressful exposure scenarios following an industrial disaster (Weisæth, 1989). Finally, the global survey of traumatic exposure suggests that work injuries were associated with emergence and duration of PTSD (Kessler et al., 2017).

PTSD has been found in a variety of injured workers, including those with hand injury (Grunet et al., 1990, 1992), upper limb amputation (Cheung et al., 2003), burns (Mancusi-Ungaro et al., 1989), those involved in industrial accidents (Weisaeth, 1989), and victims of workplace assaults and hold-ups (De Mol, 1998). As employees experience an uncontrollable

and unanticipated injury at work, it appears that incident becomes a traumatic experience for workers, leading to the development of PTSD symptoms.

Exposure to Violence

Exposure to violence at work can also have grave psychological consequences. Violence is often associated with increased stress and prolonged grief (Figley, 1989), which distorts cognitive and emotional responses, thereby increasing the likelihood of PTSD. High levels of violence exposure are related to increased traumatization and psychological distress (Ruchkin et al. 2002; Wood et al. 2002). More generally, exposure to violence was a traumatic event associated with emergence and duration of PTSD symptoms in the large global survey (Kessler et al., 2017).

People might feel safe from violence at work, but violence is an aspect of work even if an employee does not work in a high-risk occupation such as police (Barling, 1996; Leino, 2013). In the United States, more than 13 people are killed at work or on duty every day (U.S. Department of Labor, 2020). Although violence can occur in any occupation, researchers seem to agree that violence is most prominent in healthcare settings, where patients and their relatives are the most common perpetrators (Lanctôt & Guay, 2014), as nearly 75% of workplace assaults occurred in healthcare settings (Occupational Safety and Health Administration, 2015). In their examination of emergency staff, Copeland and Henry (2017) found that although 98% of emergency department staff felt safe at work, 64% felt that violence was an expected part of their job. Additionally, many nurses consider violence to simply be part of the job (Erickson & Williams-Evans, 2000). Perceptions of safety at work do not necessarily coincide with lowered risk of assault (Blando et al., 2013).

Although the rate of violence in healthcare is high, other occupations experience similar rates of violence. 80% of teachers experienced school-related violence during their careers, with 27.6% experiencing serious violence (McMahon et al., 2014; Wilson et al., 2010), with students being the most prevalent perpetrators (McMahon et al., 2014; Espelage et al., 2013). Additionally, journalists are exposed to a variety of violence, including war, violent assaults, bank robberies, torture or kidnapping, casualties, and destruction of property or equipment (Masduki, 2017; Seelke, 2019). Remember that Criterion A specifies that the traumatic event can be either directly experienced or indirectly experienced, both of which occur for journalists: they experience the violence first-hand, while also watching or processing violent footage (MacDonald et al., 2017). Taken together, workplace exposure to violence can lead to PTSD symptoms, suggesting that it can be a traumatic workplace stressor.

Sexual Harassment

Sexual harassment is characterized by unwanted behaviour, and consists of many components, including gender harassment, unwanted sexual attention, and extortion of sexual cooperation (Hershcovis & Barling, 2010). Researchers have conceptualized the experience of sexual harassment as a traumatic event (Avina & O'Donohue, 2002). However, the potential ambiguous nature of sexual harassment and its lack of fit within the Criterion A framework has led to debates as to whether PTSD can arise from sexual harassment alone, or whether only sexual assault is a sufficiently traumatic event to warrant the PTSD label (Avina & O'Donohue, 2002; Fitzgerald et al., 2013; Larsen & Fitzgerald, 2010). Fitzgerald et al. (2013, p. 86) state, "Perhaps no potential candidate for a…stressor is as misunderstood (or hotly contested) as sexual harassment."

Aligned with this sentiment, Avina and O'Donohue (2002) suggest that mental health practitioners do not consider sexual harassment to be traumatic, unless it is rape or battery. Sexual harassment lies on a broad scale, including a singular remark, threats, hostile environments, sexual battery, and rape; its definition as a traumatic event under Criterion A is unclear. Yet sexual harassment has been found to result in PTSD in nearly a third of victims (Avina & O'Donohue, 2002).

Sexual harassment is linked to increased stress, psychological distress, depression, and distorted cognitive responses (Einarsen & Mikkelsen, 2003). Research has suggested that sexual harassment coming from within the organization is far more damaging than from outside the organization, as internal sexual harassment represents a breach of psychological contract with the organization and thus more likely to reoccur, and represents an imbalance of power that limits an employee's ability to respond to the harassment (Hershcovis et al., 2010). Workplace sexual harassment leads to higher turnover intentions and lowered job satisfaction (Hershcovis et al., 2010), as well as higher stress and anxiety, depression, and diminished psychological wellbeing (Cortina & Berdahl, 2008). Beyond psychological distress, sexual harassment is positively associated with PTSD (Dansky & Kilpatrick, 1997; Stockdale et al., 2009; Willness et al., 2007). After depression, PTSD was the most common diagnosis found among harassment victims (Fitzgerald et al., 1999), and a previous meta-analysis found that sexual harassment not limited to the workplace was moderately positively related to PTSD (Willness et al., 2007), suggesting that workplace sexual harassment is likely a traumatic event, which is associated the development of PTSD symptoms.

Bullying

Although many employees may think that bullying stops after leaving school, the research suggests that this is not the case and that employees experience bullying (i.e., Mikkelsen & Einarsen, 2002). Bullying at work is an extreme social stressor, which is defined as a situation in which "someone is subjected to social isolation or exclusion, his or her work and efforts are devalued, and he or she is threatened or otherwise worn down or frustrated" (Kivimaki et al., 2000, p. 656). Workplace bullying is associated with mental (Laschinger & Nosko, 2015) and physical problems (Berthelsen et al., 2011). Bullied employees report feeling emotionally exhausted (Peng et al., 2016), and physically distance themselves from the workplace (Houshmand et al., 2012). Additionally, bullying is just one name for several different forms of workplace aggression that have empirical and conceptual overlap such as incivility, abusive supervision, social undermining, and interpersonal conflict (Hershcovis, 2011). I use the word bullying here as most of the research linking workplace aggression and PTSD is specifically on the relationship with bullying. However, when conducting the meta-analysis, I incorporate other forms of workplace aggression in this category.

Mikkelsen and Einarsen (2002) suggest that there are pernicious effects of exposure to bullying, which are comparable to other traumatic life events. They found that 76% of their bullied-at-work participants demonstrated symptoms of PTSD. However, many of these bullying victims did not meet the full diagnostic criteria for clinical PTSD; again, as it currently stands, an official diagnosis requires the experience of serious injury or physical threats (American Psychiatric Association, 2013), which might not the case with bullying. Rather, bullying involves the systematic exposure of non-physical aggression, thereby for some scholars (e.g., Haslam, 2016) eliminating bullying as a traumatic precursor to PTSD.

Although the DSM-V (APA, 2013) has expanded upon the previous version's PTSD symptomatology, incorporating indirect trauma as a possible stressor, the DSM-V still requires that the person be exposed to death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence. As bullying typically does not involve direct threats of death or serious injury, it might not be considered a Criterion A traumatic stressor. However, Mikkelsen and Einarsen (2002) found that the traumatic effects of bullying are long-lasting. Of the victims who were bullied over five years prior, more than half still displayed symptoms of PTSD. Finally, in line with Brewin and colleagues' (2009) recommendation to explore stressors that share some conceptual overlap with currently identified Criterion A traumas and examine them with PTSD symptomology, I will explore the link between bullying and PTSD.

The Current Study

There has been considerable debate about the appropriate definition for trauma within the context of PTSD (e.g., Eagle & Kaminer, 2015; Weathers & Keane, 2007), and various theories of PTSD (e.g., Ehlers & Clark, 2000; Foa & Kozak, 1986; Mowrer, 1960) propose that the individual's perception and attribution of the event is what determines its traumatic nature. Therefore, as I have proposed above various workplace stressors likely contribute to employees developing PTSD, regardless of whether these antecedents are classified as traumatic stressors by the DSM. Previous systematic reviews (i.e., Harvey et al., 2017; Stansfeld & Candy, 2006) have examined many of these workplace stressors as they are related to aspects of mental health, but they have not yet explored the link between workplace stressors and PTSD. Therefore, this meta-analysis can offer a quantitative summary and review of how workplace events relate to PTSD.

Methods

Literature Search

I completed a systematic literature search through APA PsycINFO, Business Source Complete, and Web of Science. See Appendix A for keywords searched in each database. My inclusion criteria for this study were that PTSD was quantitatively measured, and that a relationship between traumatic stress and workplace correlates was quantitatively explored. Articles with qualitative data, prevalence data, an inability to separate work from non-work factors, a focus on personality variables, a focus on disasters or terrorism, a focus on combat exposure or war, or a focus strictly on an intervention (i.e., no workplace relationship) were excluded from this meta-analysis.

Coding

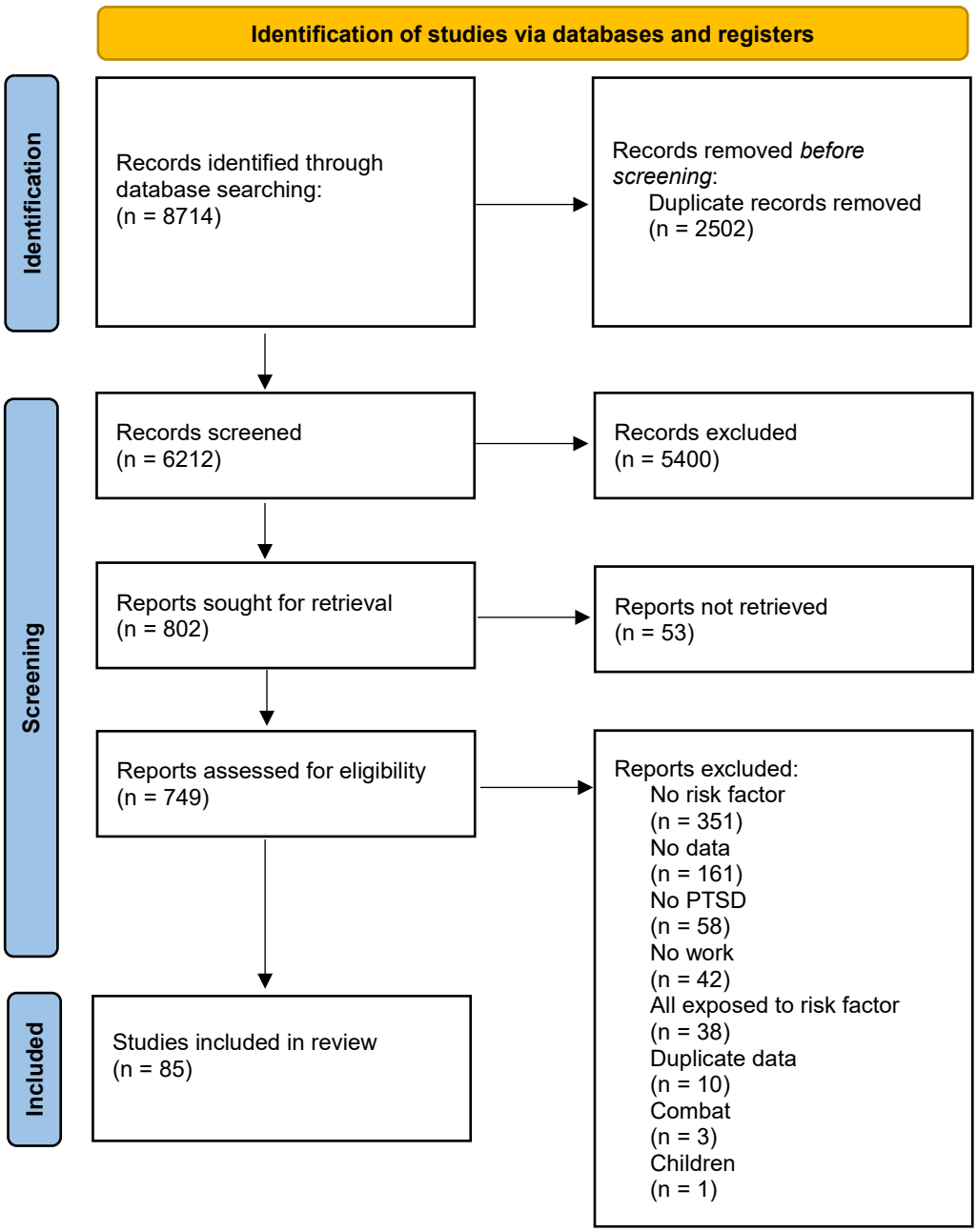
Studies were coded for publication type (e.g., journal, dissertation), year of publication and lead author, as well as method (e.g., self-report, longitudinal), number of samples, sample size, country, proportion of men, mean age of sample, and population type. PTSD measures were coded for scale type, number of items, and coefficient alpha. For each sample, each antecedent measure (e.g., injury, bullying, etc.) was measured as the correlation coefficient (r) with the PTSD score. In the case of longitudinal studies, two forms of coding were used. For intervention-focused studies, Time 1 data was used for coding, when baseline measures were established, to eliminate any effects of interventions. For other longitudinal designs, Time 2 data was used for coding as the referent in the scale was “current” as opposed to “in the last six months,” to gather more precise estimates of the relationship.

Meta-Analytic Method

The search was conducted in 2021. The main statistic reported is the zero-order correlation coefficient, *r,* and corrections were made for reliability. Both credibility and confidence intervals are reported. Credibility intervals are reported to detect the presence of potential moderators, and confidence intervals are reported for the accuracy of the effect size estimate. For the analysis, the computer program *MetaExcel* (Steel, 2003) was used.

Figure 1

PRISMA Flow Chart



Results

Figure 1 displays the PRISMA flow of articles that led to the final 85 studies included. Table 2 displays sample characteristics of the included studies. It is worth noting that PTSD was most commonly measured using self-report scales. As such, my operationalization is not the diagnosis of PTSD, but rather the severity of PTSD symptomology.

Table 2

Sample Characteristics

Sample characteristics	Percentage of total sample
Gender	
Male	48.9%
Female	51.1%
Age	
Young adult (18-25)	13.5%
Adult (26-80)	86.5%
Education	
Undeclared	4.8%
Completed high school	48.3%
Completed some college	25.0%
College degree/diploma	15.5%
Masters or Doctorate	6.4%
Country of origin	
US	39.9%
Outside US	60.1%

The most common PTSD scales assessed were the PTSD Checklist (PCL) and the Impact of Event Scale (IES-R). Given that the DSM-V opened Criterion A to include vicarious trauma, Secondary Traumatic Stress and vicarious trauma were also included. The most common scale for Secondary Traumatic Stress was the Professional Quality of Life Scale (ProQoL) and the Secondary Traumatic Stress Scale (STSS).

Table 3 displays the meta-analytic results for the relationship between workplace stressors and traumatic stress (see Figure 2 for corrected correlation funnel plot). There were 34 studies examining the relationship between job demands and PTSD (n = 42,930), 33 studies that examined exposure to violence (n = 14,827), 17 studies that examined sexual harassment (n = 10,278), 17 studies that examined workplace bullying (n = 5,355), and 14 studies that examined injury at work (n = 21,665). The results suggest that bullying, injury at work, exposure to workplace violence, job demands, and sexual harassment are all positively related to PTSD.

Table 3

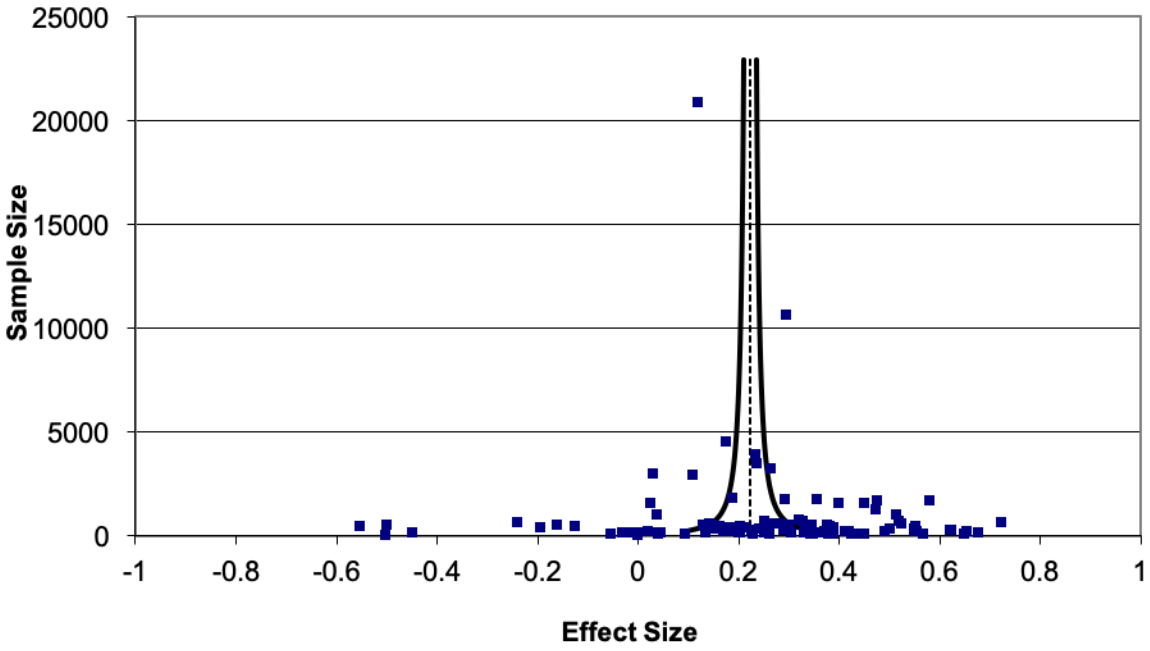
Overall Meta-Analyses of Relationships Between PTSD and Workplace Stressors

					95% CrI		95% CoI	
Variable	*k*	*N*	r_o	r_c	L	U	L	U
Bullying at Work	17	5,355	.42	.45	.11	.78	.36	.54
Exposure to Violence	33	14,827	.17	.18	-.14	.49	.12	.23
Job Demands	34	42,930	.18	.18	-.06	.41	.14	.22
Injury at Work	14	21,665	.24	.24	.10	.38	.20	.28
Sexual Harassment	17	10,278	.42	.45	.25	.64	.39	.50

Note. k = number of samples. N = total number of data points. r_o = uncorrected weighted mean correlations. r_c = weighted mean correlations corrected for reliability. CrI = credibility intervals. CoI = confidence interval.

Figure 2

Corrected Correlation Funnel Plot for all Workplace Stressors and PTSD



Workplace bullying and sexual harassment had the largest and same relationships with traumatic stress (rs_c = .45). Bullying had a larger effect size than exposure to violence (r_c = .18, z = 18.98, p < .001), job demands (r_c = .18, z = 20.88, p < .001), and injury at work (r_c = .24, z = 15.72, p < .001). Sexual harassment also had a larger effect size than exposure to violence (z = 23.53, p < .001), job demands[1] (z = 27.47, p < .001), and injury at work (z = 19.97, p < .001).

Injury at work was more highly related to PTSD than exposure to violence (z = 5.89, p < .001) and job demands (z = 7.53, p < .001). However, the relationship between exposure to violence and PTSD was not significantly different than the relationship between job demands and PTSD (z = 0.00, p = .50).

[1] Two studies for job demands had much larger sample sizes (ns = 20,841 and 10,605), so I examined results without these two outliers as well. Without the two outliers, results remain consistent (k = 32, n = 11,484, r_o = .18, r_c =.18, *CrI* [-.20 to .56], *CoI* [.11 to .25]), so I retained them for all analyses.

Multiple Time Wave Studies

Although the vast majority of research was conducted using cross-sectional data, there were nine studies which used multiple time points.

Bullying

Bond and colleagues (2010) investigated the relationship between workplace bullying and PTSD in police officers. 674 officers completed the time 1 survey, and 287 completed the time 2 survey 14 months later, although only 139 constables were included in the final analysis. Workplace bullying was positively related to current PTSD symptoms and PTSD symptoms 14 months later.

Exposure to Violence

Pihl-Thingvad and colleagues (2019) examined PTSD in response to occupational violence. The authors examined PTSD symptoms in 1763 social educators working with disabled adults after assessing incidents of physical violence and threats of violence over 12 months. Frequency of occupational violence had a direct effect on later PTSD symptomology, further cementing the relationship between workplace violence and PTSD. Additionally, the authors show that this relationship is mediated by change in burnout symptoms, change in sense of safety at work, and change in maladaptive regret coping.

Laschinger and colleagues (2019) assessed the relationship between incivility and PTSD with 406 new graduate nurses. They assessed perpetrator incivility (supervisor, coworker, and physician) in Time 1, and then a year later, assessed PTSD risk (operationalized as having at least ¾ of PTSD symptoms). Although typically seen as less harmful, these results provide support that incivility is an organizational risk factor for PTSD and can affect employee mental health a year later.

Job Demands

Van der Ploeg and Kleber (2003) examined the relationship between work stressors, including emotional demands, and PTSD. 221 ambulance workers completed the time 1 survey, and 123 completed the time 2 survey one year later. High emotional demands at time 1 were positively related to PTSD symptoms one year later.

Luft and colleagues (2012) investigated the relationship between long duration of work on site and PTSD four years later, on average, among 20,841 World Trade Center workers. Both police (n = 8505) and non-traditional responders (n = 12,333) were examined, and for both populations, long work on site was positively associated with PTSD years later.

Injury at Work

Perrin and colleagues (2007) investigated PTSD following injury during the World Trade Center attack. The authors examined 3925 police, 3232 firefighters, 1741 emergency medical services, medical or disaster personnel, 4498 construction or engineering workers, and 1798 sanitation workers. Sustaining an injury on September 11th, 2001, was the only within-disaster experience that increased risk of PTSD two to three years later among all occupations, and was the strongest risk factor for firefighters, emergency personnel, and sanitation workers.

Bowler and colleagues (2010) also examined injury during the World Trade Center attack, but focused exclusively on 4017 police responders. For both men and women, sustaining at least one injury, such as a sprain, broken bone, concussion, cut, burn, or other (excluding eye injury), during their shift between September 11, 2001 and June 30, 2002 was the strongest risk factor for PTSD two to three years later.

Sexual Harassment

Morganson (2011) examined the impact of customer sexual harassment on PTSD. Using a two-week lag, Morganson examined responses from 167 women customer service workers, and found that severity of customer sexual harassment was positively related to PTSD symptoms two weeks later.

Lawson and Fitzgerald (2016) examined data from two samples: one group of women who had participated in a sexual harassment lawsuit against their company, and one group who opted out of the lawsuit. The participants were followed over five years, with surveys sent out two and five years after the original survey. 1218 women in the litigant group completed the time 1 survey, and 440 completed all three surveys. Additionally, 465 women in the non-litigant sample completed the time 1 survey. The relationship between sexual harassment and PTSD remained consistent across time periods, although PTSD scores did decrease over time.

Moderator Analysis as a Function of Measure

I examined each workplace stressor in relation to the PTSD scales used (see Table 4). Generally, the most common scale was the PCL. Results indicate that there does seem to be a moderating effect of PTSD measure, but differences were not consistent across organizational risk factors.

Table 4

Moderator Analysis by Function of Measure

					95% CrI		95% CoI	
PTSD measure	*k*	*N*	r_o	r_c	L	U	L	U
Bullying								
PCL	3	1,194	.57	.65	.45	.84	.51	.78
IES-R	5	2,177	.33	.35	.03	.67	.19	.51
other	8	1831	.47	.49	.40	.57	.44	.54
Exposure to Violence								
PCL	13	4,442	.21	.22	.06	.38	.17	.27
IES	4	2,179	.00	-.00	-.48	.47	-1.00	1.00
other	16	8,206	.19	.20	-.11	.50	.12	.28
Job Demands								
PCL	5	33,257	.17	.17	-.02	.37	.08	.26
IES-R	5	1,134	.15	.15	-.44	.73	-.12	.41
ProQOL	12	5,914	.25	.25	-.13	.63	.14	.36
STSS	4	1,744	.09	.09	-.23	.42	-.08	.27
other	8	881	.22	.22	-.26	.71	.04	.41
Injury								
PCL	11	20,796	.24	.24	.11	.36	.20	.28
other	3	869	.31	.31	-.20	.82	.01	.61
Sexual Harassment								
PCL	11	7,492	.42	.44	.34	.54	.40	.48
other	6	2,786	.42	.47	.09	.85	.29	.65

Note. *k* = number of samples. *N* = total number of data points. r_o = uncorrected weighted mean correlations. r_c = weighted mean correlations corrected for reliability. CrI = credibility intervals. CoI = confidence interval.

Bullying

For bullying, studies using the PCL had a stronger relationship with PTSD (r_c = .65) than studies using the IES-R (r_c = .35, z = 11.37, p < .001) or any other scale (r_c = .49, z = 6.43, p < .001). The IES-R had a weaker relationship with PTSD than other scales (z = 5.38, p < .001).

Exposure to Violence

For exposure to violence, the measure of PTSD seemed to have a large effect on the relationship between violence and PTSD. Studies using the PCL had a stronger relationship (r_c =

.22) than those using the IES (r_c = .00, z = 8.55, p < .001), but were not significantly different from other measures (r_c = .20, z = 1.12, p = .13).

Job Demands

For job demands, studies using the PCL (r_c = .17) did not show significantly stronger results than studies using the IES-R (r_c = .15, z = .68, p = .25) or any other scale (r_c = .22, z = .1.52, p = .06). The Secondary Traumatic Stress measure of ProQoL had the strongest relationship with PTSD (r_c = .25), which was significantly stronger than the other Secondary Traumatic Stress measure, the STSS (r_c = .09, z = 6.06, p <.001). The ProQoL was also significantly stronger than the PCL (z = 5.93, p <.001) and the IES-R (z = 3.21, p = .001). However, it was not significantly different from other scales (z = .88, p = .19).

Injury at Work

For injury at work, studies using the PCL had a lower relationship with PTSD (r_c = .24) than studies using other scales (r_c = .31, z = 2.19, p = .01).

Sexual Harassment

For sexual harassment, there was no difference between studies using the PCL (r_c = .44) and studies using any other measure (r_c = 46, z = 1.17, p = .12).

Moderator Analysis as a Function of Occupation

I also examined each stressor in relation to the various professions to see if there were broad differences among occupational groups (see Table 5).

Bullying

In terms of bullying, I was only able to separate healthcare workers from other workers. Healthcare workers had the strongest relationship with PTSD (r_c = .50), which was significantly

stronger than other workers, which included police officers, paraprofessionals, and general workers (r_c = .44, z = 2.74, p = .003).

Exposure to Violence

In terms of exposure to violence, journalists had the strongest relationship with PTSD (r_c = .31), and were significantly stronger than teachers (r_c = .26, z = 2.09, p = .02), healthcare workers (r_c = .14, z = 7.93, p < .001), bankers (r_c = -.15, z = 11.65, p < .001), and other workers (r_c = .13, z = 6.61, p < .001). Unlike all other occupational groups, bankers were the only ones with a negative relationship to PTSD, which was significantly different from teachers (z = 10.34, p < .001), healthcare workers (z = 7.64, p < .001), and other workers, such as bus drivers, Department of Correction employees, emergency management association workers, service providers, child protective investigators and case managers, and general workers (z = 6.7, p < .001).

Job Demands

For job demands, healthcare workers had the weakest relationship with PTSD (r_c = .06), which was significantly weaker than first responders (r_c = .12, z = 3.23, p = .001) and other workers, which included child protective services workers, animal care workers, peacekeepers, paraprofessionals, service providers, social workers, veterans, and general workers (r_c = .28, z = 12.14, p < .001). Other workers had the strongest relationship with PTSD, which was also significantly stronger than first responders (z = 16.48, p < .001).

Injury at Work

Regarding workplace injuries, healthcare workers had the strongest relationship with PTSD (r_c = .32), which was significantly stronger than first responders (r_c = .25, z = 3.74, p < .001), construction, engineering, and sanitation workers (r_c = .18, z = 6.80, p < .001), but not

significantly stronger than other workers, including veterans, Department of Corrections employees, or other workers (r_c = .29, z = .95, p = .17). First responders were not significantly different from other workers (z = 1.38, p = .08) but were significantly stronger than construction, engineering and sanitation workers (z = 4.66, p < .001). Construction, engineering and sanitation workers had a significantly weaker relationship than other workers (z = 3.60, p < .001).

Sexual Harassment

For sexual harassment, a wide variety of occupations were examined including healthcare workers, customer service workers, academics/faculty, finance employees, and unspecified working employees. I was only able to examine academics vs. other due to this heterogeneity in occupational groups. Academics had the weaker relationship with PTSD (r_c = .20), which was significantly weaker than the broad category of other occupations (r_c = .46, z = 7.43, p < .001).

Overall, there does seem to be a difference among occupational groups, suggesting that the relationship between workplace stressors and PTSD may depend on occupation.

Table 5

Moderator Analysis by Function of Occupation

					95% CrI		95% CoI	
PTSD measure	*k*	*N*	r_o	r_c	L	U	L	U
Bullying								
Healthcare	7	2,169	.47	**.50**	.09	.91	.33	.67
Other	9	3,033	.41	**.44**	.22	.65	.36	.52
Exposure to Violence								
Healthcare	10	5,981	.14	**.14**	-.11	.38	.05	.22
Journalists	10	2,895	.30	**.31**	.04	.59	.21	.41
Teachers	6	2,984	.24	**.26**	.19	.33	.21	.31
Bankers	2	776	-.15	**-.15**	-.75	.45	-.59	.29
Other	5	2,091	.13	**.13**	-.14	.40	.00	.26
Job Demands								
Healthcare	11	3,405	.07	**.06**	-.23	.36	-.03	.15
First responders	8	22,222	.12	**.12**	.00	.24	.08	.17
Other	15	17,303	.27	**.28**	.06	.50	.22	.34
Injury								
Healthcare	4	3,072	.32	**.32**	.14	.50	.23	.41
First responders	4	11,174	.25	**.25**	.21	.28	.22	.27
Construction, engineering & sanitation	2	6,296	.18	**.18**	.12	.23	.13	.22
Other	4	1,123	.29	**.29**	-.18	.77	.05	.53
Sexual Harassment								
Academics	6	684	.17	**.20**	.03	.37	.08	.32
Other	11	9594	.43	**.46**	.29	.63	.40	.51

Note. *k* = number of samples. *N* = total number of data points. r_o = uncorrected weighted mean correlations. r_c = weighted mean correlations corrected for reliability. CrI = credibility intervals. CoI = confidence interval.

Moderator Analysis as a Function of Job Demand Measure

Additionally, due to the heterogeneity of results for job demands, I examined the measurement of job demands as a possible moderator (see Table 6). General job demands had the strongest relationship with PTSD (r_c = .51), which was significantly greater than work overload (r_c = .31, z = 4.21, p < .001), workload (r_c = .25, z = 9.23, p < .001), hours worked (r_c = .12, z = 13.45, p < .001), caseload (r_c = .10, z = 10.07, p < .001), and other (r_c = .40, z = 3.24, p =

.001), which included number of calls, emotional demands, emotional loads, job pressure, organizational hassles, and time demands. Workload and work overload were not significantly different from each other ($z = 1.35$, $p = .09$), though they were both significantly stronger than hours worked ($z = 12.95$, $p < .001$; $z = 4.16$, $p < .001$) and caseload ($z = 4.60$, $p < .001$; $z = 3.81$, $p < .001$), respectively. Hours worked and caseload were not significantly different from each other ($z = .61$, $p = .27$).

Table 6

Moderator Analysis by Function of Job Demands Measure

					95% CrI		95% CoI	
Job Demands measure	*k*	*N*	r_o	r_c	L	U	L	U
Caseload	5	939	.09	.10	-.05	.24	.00	.19
Work hours	5	24,525	.12	.12	.09	.15	.10	.14
Work overload	3	443	.29	.31	.15	.47	.17	.45
Workload	10	14,802	.25	.25	-.04	.54	.15	.34
General job demands	4	964	.44	.51	.29	.74	.37	.65
Other	7	1,257	.37	.40	.13	.67	.28	.53

Note. *k* = number of samples. *N* = total number of data points. r_o = uncorrected weighted mean correlations. r_c = weighted mean correlations corrected for reliability. CrI = credibility intervals. CoI = confidence interval.

Discussion

Although organizational research has explored mental health from a variety of perspectives, our understanding of PTSD at work is still nascent. This study sought to investigate workplace stressors that contribute to PTSD. The results from this meta-analysis suggest that the initial trauma may take various forms, including bullying, injury, exposure to violence, sexual harassment, and job demands. All these workplace stressors were positively related to PTSD. Overall, bullying and sexual harassment had the strongest relationships with PTSD symptoms and job demands had the weakest albeit a significant relationship.

Although not previously considered as a traumatic stressor, this study suggests that job demands are predictive of PTSD symptoms. Despite the DSM guideline for PTSD with the requirement that Criterion A must be a traumatic event of a type in which job demands do not meet that criterion, the predictive ability of job demands suggests that this element of the work environment has the potential to be a risk factor for the development of PTSD symptoms.

The moderator analyses revealed that both PTSD measure and occupation group may influence the relationship between workplace stressors and PTSD. These findings suggest that researchers must be cognizant of the methodological choice they make when choosing PTSD measures and that future research needs to explore why certain measures might be better suited to the workplace than other measures. Regarding occupation as a moderator, there were significant difference between occupational groups, suggesting that employees may experience workplace stressors and traumatic work events differently depending on their work situation. Future research should remain cognizant of the populations it is examining, as some occupational groups may be better suited to answer specific questions.

Additionally, the moderator analysis on job demands suggests that in addition to occupational groups, the measurement of job demands has an impact on its relationship with PTSD. There is a wide variety of measures of job demands, ranging from objective measures, such as hours worked, to more subjective ones, such as perceptions of workload. Future research should consider the effect these different measures have and should explore the effects of these different job demands on employee mental health.

Many studies have examined mental health at work, but the current meta-analysis suggests that more needs to be done. As governmental bodies and employees themselves are establishing mental health as a key concern (i.e., Business Development Bank of Canada, 2020;

Centers for Disease Control and Prevention, 2019; Mental Health Commission of Canada, 2009, 2021), it would be a disservice to both employees and employers if we do not broaden our focus on mental health beyond depression and anxiety to also include other mental disorders such as PTSD. In the next sections, I propose future scholars expand their thinking of mental health to include PTSD, assess PTSD on a continuum, and investigate PTSD within the context of the Cognitive Activation Theory of Stress (CATS: Ursin & Eriksen, 2004), combining the cognitive view of PTSD with self-regulation.

Theoretical Implications

Results from this meta-analysis indicate that we should not assume that only traumatic events, such as intense violence, relate to PTSD symptoms. As the current results show, the relationship between bullying and PTSD is a moderate effect size. If we only examine PTSD within the context of extreme violence and natural disasters, we are doing a disservice to suffering employees who might not fit that stereotype. Williams and Williams' (2020) review of PTSD at work began to examine PTSD within the organizational context, stepping in the right direction. However, their review still stays close to traditional traumatic events and focuses on a resources model of PTSD. It does not delve deeper into the potential alternative workplace stressors of PTSD. By holding onto such a narrow definition of trauma, organizational scholars may miss meaningful and potentially strong organizational predictors of PTSD. PTSD is not commonly examined in organizational research. The prevalence rates of PTSD are much lower than depression and anxiety generally in the population, which may have caused researchers to incorrectly assume that PTSD is not a pressing workplace issue.

High-strain jobs (often characterized by high job demands and low job control) are associated with a variety of mental health concerns, including depression and anxiety (Stansfeld

& Candy, 2006), and Karasek's (1979) job-strain model has long been used to explain and understand the effects of job demands on mental health. Indeed, multiple meta-analyses and systemic reviews (i.e., Harvey et al., 2017; Stansfeld & Candy, 2006) suggest that various workplace psychological hazards, particularly increased job demands, are related to mental health issues in employees, such as depression and anxiety. Although these studies have provided valuable information surrounding the organizational context of mental health, they fail to consider mental illness beyond depression and anxiety.

In organizational psychology, mental health is typically divided into wellbeing, general mental health, or depression or anxiety (e.g., Stansfeld & Candy, 2006). Rarely is PTSD considered a variable of interest to organizational research. To develop a comprehensive understanding of mental health at work, future research must consider PTSD at work. Many measures of PTSD are self-reported scales which could be easily introduced into already existing research designs and surveys. Follmer and Jones (2018) suggest that one of the reasons why depression is so disproportionately studied is that there are readily available "psychometrically sound measures and checklist that identify clinical levels of depression" (p. 332). Yet similar types of psychometrically sound scales exist for PTSD as well: the PTSD Symptom Scale (Foa, 2013), Impact of Events Scale (Weiss, & Marmar, 1996), PTSD Checklist (Weathers et al., 2013), and Symptom Checklist-90 (Derogatis, 1983), which are easily accessible for researchers, have a large research backing, and even include cutoffs to identify clinical levels of PTSD symptoms. Lack of measurement options does not seem to be the issue here; rather, as much of the current public discourse revolves around depression and anxiety, these are likely more convenient for researchers investigating mental health. I propose expanding this definition in future research by including PTSD in research questions and analyses. Not only should we be

assessing PTSD prevalence rates, but we should also be investigating organizational antecedents and outcomes to PTSD.

Implications for Research and Practice

PTSD on a Continuum

In clinical research, it is common practice to dichotomize both variables and constructs. When a variable is dichotomized, empirical information is lost, and when a construct is dichotomized (a person has or does not have PTSD), theoretical variability is lost. This was reflected in many studies in which PTSD was assessed as a dichotomized variable: either employees had PTSD or they did not. But dichotomizing this way not only limits statistical power, but it also leads to serious bias (Irwin & McClelland, 2003; MacCallum et al., 2002; Royston et al., 2006). Cutoff points are often quite arbitrary, and the *p*-value is optimized for the specific sample, but not necessarily generalizable to other samples or populations (Royston et al., 2006).

As PTSD was commonly reported with self-reported scales (i.e., PTSD Symptom Scale, Impact of Events Scale, PTSD Checklist, or Symptom Checklist-90), PTSD can be measured on a continuum. Not only does this ensure complete data, it also disregards the arbitrary cutoffs used for each scale. By fully using all data, we ensure a more complete understanding of PTSD by accessing the full range of scores, not losing information, retaining power, and not having to maintain uncertainty about cutoff scores (Royston et al., 2006).

Multiple studies, even though they quantitatively measured a workplace stressor, had to be excluded from the current meta-analysis because their entire sample had PTSD. It is impossible to conduct a meta-analysis on studies in which the relationship between variables of interest statistically cannot be assessed. We need variability on the PTSD measure to understand

the effect of the work context of PTSD. Unfortunately, this also limits our understanding of PTSD as we cannot compare it to a population without PTSD. For example, if researchers are interested in examining the impact of work injury on PTSD, but only examine employees already with PTSD, this severely limits our ability to understand that relationship. Beyond examining PTSD on a continuum, researchers also need to ensure that they are not purposefully selecting a range-restricted population. Future research on PTSD at work should not only examine PTSD on a continuum, but also consider all employees, to ensure a complete and comprehensive understanding of the phenomenon.

Better Integrating Work and PTSD

Apart from expanding our view of mental health and measuring PTSD on a continuum, the nature of the trauma is a significant hurdle for researchers looking to study workplace stressors and PTSD. The Criterion A debate and controversy may have led researchers to believe that PTSD can only occur after what the DSM considers a traumatic event. Although this thinking is changing, and the DSM is slowly moving away from this assumption, we must also ensure that organizational psychology as well as clinical psychology continue to examine the empirical link between stressors and PTSD symptoms. As researchers explore the link between workplace stressors and PTSD, they should be guided by theory. To that aim, I suggest that researchers turn to the Cognitive Activation Theory of Stress (CATS) (Ursin & Eriksen, 2004) to explore workplace stressors that may have previously gone unnoticed as potentially traumatic events.

A Framework for Studying Workplace PTSD: Cognitive Activation Theory of Stress

The CATS model (Ursin & Eriksen, 2004) can help organizational researchers explore the complicated and intricate relationship between workplace stressors and PTSD. The theory

integrates work from clinical psychology with work on self-regulation (Meurs & Perrewé, 2011). The CATS model suggests an alternative explanation for why employees are suffering at work: employees' expectations of the job do not match with their reality. According to CATS, individuals develop PTSD not from the response itself, but because of the imbalance between the expected situation and reality, and between their goals and their current situation. The stressful event itself is not what causes ill effects. Rather, the individual's response to the stressor is more likely to affect their health and wellbeing, which is aligned with occupational theorizing on well-being (e.g., Edwards, 1992; Meurs & Perrewé, 2011; Vancouver & Weinhardt, 2012).

CATS (Ursin & Eriksen, 2004) is based on individuals' cognitive appraisals of the situation, and builds off cognitive models of PTSD (i.e., Ehlers & Clark, 2000). Individuals experience a stress "alarm" when there is a discrepancy between what is desired (their expectancies) and what is reality. Expectancies concern an individual's understanding of the situation, whether the stimulus or the outcome. In this way, CATS can be considered an extension of self-regulation theory.

Individuals self-regulate to reduce the discrepancy between their desired state (their expectations) and their current state (Carver & Scheier, 1990). Self-regulation is a process based on directing oneself to one's goals and gathering feedback about the process of goal attainment (Bandura, 1991). Setting goals provides challenges which are necessary for action and motivation. At the centre of self-regulation lies setting appropriate goals, taking actions to attain the goals, comparing progress against the goals, and making any modifications. This is performed through a feedback loop: individuals monitor feedback of thoughts, emotions and behaviours, appraise the elements of a situation, and, when the goal remains to be completed, take appropriate action to reach the goal. If there is a discrepancy between the current state of an

individual and their desired state or goal, steps can be taken to reduce the discrepancy, thus moving closer toward the goal state (Vancouver, 2008). Discrepancies between the individual's expectations and their current state guide self-regulation: individuals work to reduce the discrepancy between the two states, engaging in goal-directed behaviour, as they experience a stress response due to that discrepancy.

Ursin and Eriksen (2004) consider the stress response to be healthy and necessary. Rather than the stress response automatically being seen as a dangerous and long-lasting response, the authors suggest that the stress response is necessary to deal with everyday problems. The stress response is what directs behaviour to reduce the discrepancy. An individual's response to the discrepancy can be either positive, negative, or none, which leads to coping, hopelessness, and helplessness, respectively (Ursin & Eriksen, 2004). When an individual positively responds to the discrepancy, Ursin and Eriksen refer to this as coping: the individual sets goal-directed behaviours to reduce the discrepancy as they believe that they can handle the situation with a positive result. It is worth noting here that *coping* refers to the individual's cognitive response – the expectation of a positive outcome – rather than the exact strategy or behaviour. If some individual feels that they will be able to respond to the situation, and thus arrive at their desired state, there will be a low stress response. With a low stress response, individuals are not at risk for PTSD. If a person has control over a situation and expects an outcome, stressors will not be experienced in the same way as if they were not in control of the situation and their expectancies were different. Conversely, when the individual acknowledges the discrepancy, but feels like all behaviours will result in negative results, Ursin and Eriksen (2004) refer to this as hopelessness. In this case, the individual feels that they have control over the situation, but the outcomes are all negative. This hopeless reaction can become generalized and may lead to depression.

However, when the individual acknowledges the discrepancy, but learns that there is no relationship between their behaviours and any outcomes, thereby feeling like it is impossible to resolve that discrepancy, Ursin and Eriksen (2004) refer to this as helplessness. There is no response to the discrepancy as the individual has no control. This response, as opposed to coping and hopelessness, is characterized by feelings of no control over the outcome. When events are uncontrollable or unpredictable, or individuals feel that events are beyond their control, individuals experience a sense of helplessness. No matter what the individual may do, they feel that it cannot affect the outcome. Helplessness tends to become a generalized response to any stressful situation and can form the basis for anxiety and PTSD (Oliff et al., 2007). Individuals are unable to deal with the discrepancy between their desired and actual realities and feel no control over the outcomes. This lack of control causes increased anxiety and psychological arousal, as the individual feels powerless to combat the stress response. If an individual does not see a relationship between their actions and the outcome, lacking both control and predictability, PTSD can occur (Yehuda, 2002).

In terms of the workplace, people expect a safe environment at work: safe from injury, safe from bullying and violence, and safe from overwork (Walker, 2013; Walker & Hutton, 2006). There is a psychological contract of safety between employers and employees, where both employers and employees are responsible for safety in the workplace (Walker, 2013; Walker & Hutton, 2006). Yet the literature suggests that despite this psychological contract, employees are not always safe at work. Employees are, for example, injured at work (Grunert et al., 1992). Being injured at work constitutes a breach of the psychological safety contract, and leads to a reduction in trust in the employer (Walker, 2013; Walker & Hutton, 2006). As they get injured, workers may be unable to cope with the situation, and feel a sense of helplessness: they may be

unable to see a relationship between future actions and their safety, resulting in PTSD symptoms. When that psychological contract is broken, when employees' reality does not match their pre-conceived notions of the job or their expectations of the job, employees experience mental health problems, including PTSD symptoms.

CATS suggests that traditionally traumatic experiences do not always result in PTSD, and PTSD can result from what would otherwise be seen as perhaps mundane, everyday work experiences (Oliff et al., 2005a, 2005b; Ursin & Eriksen, 2010), such as overwork and increased job demands. The traumatic experience itself does not cause PTSD; rather, the discrepancy between the individual's expected situation and current reality is what develops PTSD. If we continue to fail to consider PTSD trauma with a broader trauma lens, we are not only limiting our view of mental health in general, but we are also diminishing employees' experiences and failing to comprehend the extent to which the workplace can serve as the catalyst for mental ill health.

Although the data are limited, the current meta-analysis' moderator analyses provide some initial support for CATS: if firefighters are more likely to expect a stressful work environment as compared to documentarians and journalists, we would expect the relationship between work stress and PTSD to be lower among firefighters. Indeed, the results do support this: the relationship between work stress and PTSD is much stronger for journalists and documentarians than for firefighters. However, this is not sufficient evidence for CATS, and more research must be conducted on occupational groups and expectancies to test the CATS model in relation to PTSD and work expectancies.

To understand the relationship between of expectancies and PTSD, future research must specifically explore employees' expectancies in different occupational groups. A safe working

environment for a police officer likely looks quite different than a safe environment for a nurse, which likely looks quite different than a safe environment for a pilot. We need future research to examine specifically and directly what employee expectations are for each occupational group, to more completely understand when there is a psychological contract breach.

Future Research Directions – Methods

Diary and Longitudinal Studies

One of the ways to examine employees' expectancies is through diary studies. Diary studies could provide a day-to-day examination of employees' expectancies, and if or when they change throughout a short period of time. There is currently very limited research about employee expectancies. To test CATS in the workplace, we first need a comprehensive overview of employee expectancies. How consistent are expectancies among employees? Do they change over a short period of time? Are they influenced by coworkers or events? Are the changes also reflected in changes in PTSD?

Additionally, once expectancies are gathered, employees could be monitored over an extended period of time to examine critical incidences and PTSD symptoms. People experience many potentially traumatic events, which will not necessarily develop into PTSD (Kilpatrick et al., 2009). On the other hand, complex PTSD arises from chronic or repeated exposure to trauma, even when one individual incident may not be deemed traumatic under Criterion A. Understanding the frequency of traumatic events is imperative to understanding workplace PTSD. For example, in 2012, Facebook came under fire as articles began to report PTSD and deaths from content moderators (employees assigned to sift through violent, horrific or disturbing content, including beheadings, child abuse, hate speech, violence, assault and bullying, to determine whether the content violates Facebook's guidelines). These employees are

exposed to potentially traumatic content on a daily basis, and many have developed PTSD from their work. In 2018, a class-action lawsuit was filed which was settled in 2020 (Au-Yeung, 2021).

Using a critical incident technique, such as the Critical Incident History Questionnaire (e.g., Weiss et al., 2010), allows researchers to tap into a particular traumatic incident. Often, the traumatic event is assessed as either the worst event that happened, or a randomly selected one (Kilpatrick et al., 2009), which has its own challenges and limitations. Although time consuming, a critical incident technique is more suited for individual traumatic events, such as harassment, violence, or injury, rather than job demands of work stress. It permits a detailed examination of the event, including frequency and severity, that, combined with expectancies already gathered, would be a worthwhile investigation into expectancies and their role in PTSD. Do frequency and severity of the traumatic event differentially predict PTSD? And how do frequency and severity moderate the relationship between expectancies and PTSD? If Facebook content moderators are dealing with this recurring trauma on a daily basis, can we adjust their expectancies to improve their mental health? Is there a limit as to how much content employees can moderate per day or per week before suffering from PTSD?

Further, longitudinal studies are needed in particular to examine the less stereotypical traumatic events, such as job demands and work stress. A single incident of high job demands might not lead to PTSD, as people expect some work days to have higher demands than others. However, a prolonged length of time with high job demands, particularly when employees have an expectation of a less demanding work environment, may be the cause of PTSD. A single time point may not be enough to fully capture this relationship, and longitudinal studies are necessary.

Finally, as CATS can provide a theoretical framework for examining beyond the typical Criterion A stressors, researchers must expand on workplace stressors that are associated with PTSD. For example, there is a dearth of knowledge of the relationship between layoffs or termination and PTSD. From a CATS perspective, individuals likely do not foresee their termination; thus, their expectancy is that of continuing to work in that environment. When they are fired, the employees experience a discrepancy between that expectancy and their reality of losing their job. They have no control over the outcome, which leads to the potential for helplessness and PTSD. Future research must examine the impact of layoffs on PTSD, particularly with regard to expectancies. Further, researchers should compare PTSD symptoms among employees who knew their layoff was imminent before their termination versus employees whose termination came as a complete shock. According to CATS, these two groups should have very different levels of PTSD.

Interventions

Perhaps most importantly, the question remains what organizations can do to limit the suffering of their employees. This includes what organizations can do to limit PTSD in their employees. There is wide research on interventions for PTSD. Interventions such as eye movement desensitization and reprocessing (EMDR), exposure therapy, and trauma-focused cognitive-behavioural therapy (CBT) were found to have large effect sizes (Cusack et al., 2015; Seidler & Wagner, 2006). Although critics might argue that these kinds of interventions may not be feasible in the workplace, Tan and colleagues (2014) found that delivering CBT at work had a positive effect on employee mental health. Although the authors focused on depression not PTSD, the efficacy of the interventions suggests that there could be similar positive findings for

workplace interventions targeted toward PTSD. Indeed, Joyce and colleagues (2015) found that implementing CBT in the workplace has a positive effect on anxiety in addition to depression.

In terms of other workplace-specific interventions, Jonker and colleagues (2020) suggest that psychological trauma management programs that focus on multiple counseling sessions, face-to-face counseling, regaining control, and receiving support are beneficial for high-risk occupation groups such as mining, policing, and emergency medical services. However, these types of interventions fail to consider expectancies. If expectancies are the main driver behind PTSD, what can organizations do for their employees? As Drewitz-Chesney (2012) suggests, current interventions are not effective in decreasing PTSD among paramedics. Paramedics are a unique occupational group representing the highest rate of PTSD in emergency service workers. If traditional interventions, such as biomedical, behavioural and socioenvironmental interventions, have not been effective, perhaps interventions focusing on expectancies are to where the field needs to move.

Hom et al. (1998) suggest that met expectations are the reason why realistic job previews are successful. They prepare employees to have specific expectancies about the work environment and the nature of the job, ensuring a lowered discrepancy between employees' expectancies and their working reality. Previous research has found positive benefits for realistic job previews, including increasing organizational commitment, job satisfaction, and performance, and reducing turnover (Meglino et al., 2000; Premack & Wanous, 1985). Realistic job previews can set employees' expectancies (Avner et al., 2010), affecting how they perceive the work environment. Moreover, Wanous and colleagues (1992) suggest in their meta-analysis that employees identify more with organizations that fulfill met expectations, and employees who received realistic job previews held more accurate job expectations that are more easily met

(Saks & Cronshaw, 1990). For example, Hom and colleagues (1998) found that the nurses who received realistic job previews anticipated work overloads, including expecting overwork, a key component of job demands. Therefore, as a first step, we need to test realistic job previews around exposure to traumatic events for occupations that are likely to experience forms of traumas such as injury, violence, and witnessing of these traumas. Creating realistic expectancies around the experience of trauma should limit the development of PTSD symptoms after a potentially traumatic event.

Conclusion

Follmer and Jones' (2018) call for additional research on mental illness at work suggests that mental illness at work is not investigated as it should be. Harmful aspects of the workplace remain rampant, and the effects of these stressors negatively impact employees, contributing to increased psychological distress in the form of PTSD. My meta-analytic results suggest that the workplace can have a profound impact on the PTSD, particularly in terms of bullying, injury, exposure to violence, sexual harassment, and job demands. All workplace stressors were found to be positively associated with PTSD symptomology. A moderator analysis based on PTSD measure and occupational group suggest that both PTSD measures and occupational group have an effect on the relationship between workplace stressors and PTSD symptoms. Prevalence rates of PTSD paint a surprising story of abundant distress at work, yet research on PTSDs in the workplace remains relatively unexplored. I urge researchers to continue to explore suffering at work to better understand, and ultimately better the human condition at work.

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Appendix A – Database Search Terms

APA PsycInfo

1. posttraumatic stress disorder/ or exp complex ptsd/ or exp posttraumatic stress/
2. (PTSD or Post-traumatic or Posttraumatic or Vicarious trauma* or Compassion fatigue or traumatic stress*).tw.
3. 1 or 2
4. occupations/ or exp employment status/ or exp job characteristics/ or exp nontraditional careers/ or personnel/ or exp working women/
5. (Occupation* or Employment or Personnel).tw.
6. (Workplace* or Worker* or Employee* or employment* or Organi?ations or organi?ational).tw.
7. 4 or 5 or 6
8. risk factors/ or exp psychosocial factors/ or exp causality/
9. (Antecedent* or Risk factor* or Predictor* or Psychosocial factor* or Causalit*).tw.
10. injuries/ or exp burns/ or exp electrical injuries/ or exp accidents/ or exp falls/ or exp safety/
11. (Injur* or Burn or Burns or burned or Accident* or Falls or Safety).tw.
12. bullying/ or exp cyberbullying/ or exp aggressive behavior/ or exp conflict/ or exp dominance/ or exp emotional abuse/ or exp harassment/ or exp perpetrators/ or exp physical abuse/ or exp teasing/ or exp threat/ or exp victimization/
13. (Bullying* or bullied or Mobbing* or mobbed or Teasing or teased or Threat* or Victimi* or Cyberbull* or Ostraci*).tw.
14. workplace violence/ or exp violence/ or exp working conditions/
15. violence/ or gun violence/ or exp patient violence/ or exp violent crime/ or exp workplace violence/ or exp exposure to violence/
16. (Violence or violent or Working condition* or Aggressi* or Conflict or conflicts or Dominan* or Abuse* or abusi* or Harass* or Mistreat* or mis-treat* or Molest* or Perpetrator* or Assault* or crime* or criminal*).tw.
17. sex offenses/ or exp sexual abuse/ or exp sexual harassment/
18. rape/ or exp sexual abuse/ or exp violent crime/
19. ((Sexual* adj2 (abus* or harass* or assault* or offense*)) or rape* or raping*).tw.
20. job characteristics/ or exp job security/ or exp work load/ or exp work scheduling/
21. occupational stress/ or exp compassion fatigue/
22. stress/ or chronic stress/ or environmental stress/ or financial strain/ or psychological stress/ or social stress/
23. working conditions/ or exp social environments/ or exp job enrichment/ or exp "noise levels (work areas)"/ or exp occupational safety/ or exp telecommuting/ or exp work rest cycles/ or exp work week length/ or exp workday shifts/ or exp working space/
24. exp work load/
25. job demands.tw.
26. (Job demand* or Work load* or workload* or Job characteristics or Job security or Work schedule* or Work* condition* or Social environment* or Job enrichment or Noise level* or Telecommut* or (Work* adj2 (cycle* or length or shift* or space*))).tw.
27. (layoff* or lay off* or laid off* or terminat* or job loss*).tw.
28. or/8-27
29. 3 and 7 and 28

Web of Science:

(Antecedent* or "Risk factor*" or Predictor* or "Psychosocial factor*" or Causalit* or Injur* or Burn or Burns or burned or Accident* or Falls or Safety or Bullying* or bullied or Mobbing* or mobbed or Teasing or teased or Threat* or Victimi* or Cyberbull* or Ostraci*) (Title) or (Antecedent* or "Risk factor*" or Predictor* or "Psychosocial factor*" or Causalit* or Injur* or Burn or Burns or burned or Accident* or Falls or Safety or Bullying* or bullied or Mobbing* or mobbed or Teasing or teased or Threat* or Victimi* or Cyberbull* or Ostraci*) (Abstract) or (Violence or violent or "Working condition*" or Aggressi* or Conflict or conflicts or Dominan* or Abuse* or abusi* or Harass* or Mistreat* or mis-treat* or Molest* or Perpetrator* or Assault* or crime* or criminal* or (Sexual* NEAR/2 (abus* or harass* or assault* or offense*)) or rape* or raping*) (Title) or (Violence or violent or "Working condition*" or Aggressi* or Conflict or conflicts or Dominan* or Abuse* or abusi* or Harass* or Mistreat* or mis-treat* or Molest* or Perpetrator* or Assault* or crime* or criminal* or (Sexual* NEAR/2 (abus* or harass* or assault* or offense*)) or rape* or raping*) (Abstract) or ("Job demand*" or "Work load*" or workload* or "Job characteristics" or "Job security" or "Work schedule*" or "Work* condition*" or "Social environment*" or "Job enrichment" or "Noise level*" or Telecommut* or (Work* NEAR/2 (cycle* or length or shift* or space*)) or layoff* or "lay off*" or "laid off*" or terminat* or "job loss*") (Title) or ("Job demand*" or "Work load*" or workload* or "Job characteristics" or "Job security" or "Work schedule*" or "Work* condition*" or "Social environment*" or "Job enrichment" or "Noise level*" or Telecommut* or (Work* NEAR/2 (cycle* or length or shift* or space*)) or layoff* or "lay off*" or "laid off*" or terminat* or "job loss*") (Abstract)

(PTSD or “Post-traumatic” or Posttraumatic or “Vicarious trauma*” or “Compassion fatigue” or “traumatic stress*”) (Title) or (PTSD or “Post-traumatic” or Posttraumatic or “Vicarious trauma*” or “Compassion fatigue” or “traumatic stress*”) (Abstract)

(Occupation* or Employment or Personnel or Workplace* or Worker* or Employee* or employment* or "Organizations" or "organizational" or "Organisations" or "organisational") (Title) or (Occupation* or Employment or Personnel or Workplace* or Worker* or Employee* or employment* or "Organizations" or "organizational" or "Organisations" or "organisational") (Abstract)

Business Source Complete:

TI ((PTSD or “Post-traumatic” or Posttraumatic or “Vicarious trauma*” or “Compassion fatigue” or “traumatic stress*”)) OR AB ((PTSD or “Post-traumatic” or Posttraumatic or “Vicarious trauma*” or “Compassion fatigue” or “traumatic stress*”)) OR KW ((PTSD or “Post-traumatic” or Posttraumatic or “Vicarious trauma*” or “Compassion fatigue” or “traumatic stress*”))

TI ((Occupation* or Employment or Personnel or Workplace* or Worker* or Employee* or employment* or "Organizations" or "organizational" or "Organisations" or "organisational")) OR AB ((Occupation* or Employment or Personnel or Workplace* or Worker* or Employee* or employment* or "Organizations" or "organizational" or "Organisations" or "organisational")) OR KW ((Occupation* or Employment or Personnel or Workplace* or Worker* or Employee* or employment* or "Organizations" or "organizational" or "Organisations" or "organisational")) OR SU ((Occupation* or Employment or Personnel or Workplace* or Worker* or Employee* or employment* or "Organizations" or "organizational" or "Organisations" or "organisational"))

Chapter 3:

Leader Mental Health: A Systematic Review

In myriad movies, books, and television shows focused on leadership (Meindl, 1995), leaders are often portrayed as strong, intelligent, and dynamic individuals with positive psychological well-being. Implicit leadership theories support this view (Epitropaki & Martin, 2004). Yet, despite its prevalence, the dominant assumption about leaders' strong mental health remains largely untested. As a result, it is unclear how accurate these portrayals are. This paper seeks to address this ambiguity, exploring the extant research on leader mental health to help clarify the construct and its realities.

Given leaders' obvious importance in organizational life, the overall lack of research on leader mental health is striking. Indeed, Barling and Cloutier (2017) assert that leaders are "mostly absent" from the "rich body of knowledge" surrounding mental health at work (p. 1) and even go as far as to say that the topic has been ignored. Numerous examples support their argument. For instance, Follmer and Jones' (2018) review of research on mental illness at work focuses exclusively on non-leader employee mental illness. Moreover, research on non-leader employee mental health continues to expand every year, with multiple reviews and meta-analyses on the topic (e.g., Follmer & Jones, 2018; Harvey et al., 2017; Stansfeld & Candy, 2006). Barling and Cloutier (2017) posit that both researchers and the general public hold the assumption that leaders should have good mental health, and this shared logic is one of the reasons that there has not been widespread study of leaders' mental health. Even more pernicious is the belief that leaders' mental health is not an important consideration because of their status and the assumption that those who can make it to leadership positions are able to withstand the pressures that accompany them (Barling, 2018). Thus, many people assume that leaders

experience positive psychological well-being because of greater job control, greater resources, greater resilience, greater status, and less job stress (Barling & Cloutier, 2017).

However, this assumption fails to consider the characteristics of leadership that might negatively impact leaders' mental health, such as greater work demands, responsibility for followers, organizational pressures, and long hours, among other factors (e.g., Hsu et al., 2016; Sharma, 2007; Worrall & Cooper, 1995). Although leaders may experience a certain level of control and resources that buffer the effects of high work demands, this is not always the case. Leader tasks and job demands vary widely from organization to organization, and from leader to leader (Hambrick et al., 2005). As their responsibilities increase, leaders must work longer hours and often experience a higher workload than non-leaders. However, not every organization provides leaders with the resources and control to offset this increase in demands. Hence, if leaders are unable to mitigate the higher job demands, they may suffer from mental health problems (Hsu et al., 2016).

To this end, concerns about increasing workloads and declining mental health should include leaders as well as employees. Research indicates that white-collar employees are working longer hours than in the past (Johnson & Lipscomb, 2006). In their systematic review of long working hours and health, Bannai and Tamakoshi (2014) found that working long hours is associated with worse sleep and psychological disorders, including depression and anxiety. Additionally, leaders are not exempt from work-family and family-work conflict, both of which are associated with stress (Dartey-Baah, 2015), lowered mental health, increased burnout (Kossek & Ozeki, 1999), and psychological distress (Frone, 2000). As leaders struggle to maintain both a positive work-related and family-related self-image in the face of various identity threats, they experience that struggle as stressful (Frone, 2000), which can impact their

mental health. Further, leaders might experience greater mental health problems than non-leaders due to their inability to detach from work—a factor that has been linked to mental health problems such as exhaustion and anxiety (Sonnentag, 2015; Flaxman et al., 2012). There is no literature to suggest that leaders are better able to detach from work than other employees; if anything, due to their longer working hours and higher levels of responsibility, psychological detachment is likely even more difficult for leaders.

Rather than rely on common folk beliefs about leaders and their mental health, we need to develop a better understanding of the empirical data on this issue. While Barling and Cloutier's (2017) main point throughout their seminal work on leader mental health is that leader mental health has been ignored, the authors do not conduct a systematic review of the literature to support this point. Accordingly, this paper systematically examines the research on leader mental health in order to address this gap. For clarity, I first define the key terms "leader" and "mental health" in the context of this research. I then review previous research with the aim of answering two questions: (1) What are the predictors of leader mental health? (2) Do leaders have better or worse mental health than employees at other levels? I close with the implications, future directions for leadership research, and limitations posed by this paper.

Conceptualizing Leaders

Despite the abundance of research on leadership, a consistent definition of the concept remains elusive. Stogdill (1974) stated that "there are almost as many definitions of leadership as there are persons who may have attempted to define the concept" (p. 7). Indeed, there might be as many different types of leaders and leadership positions as definitions. Based on previous work examining leader role occupancy (e.g., Arvey et al., 2006; Bass, 1990; Judge et al., 2002; Li et al., 2012; Li et al., 2015; Sherman et al., 2012), I investigate leadership and leaders as

occupying a supervisory position or having supervisory responsibilities. This represents the first step in the leadership process (Ilies et al., 2004; Bass & Bass, 2008), and is therefore a basis for examining leader mental health.

Conceptualizing Mental Health

Like leadership, the concept of mental health is highly ambiguous (e.g., Ganster & Schaubroeck, 1991; Schonfeld et al., 2018; Wang et al., 2011). Smith (1961, p. 300) states that "'[m]ental health' should not be regarded as a theoretical concept at all, but as a rubric or chapter heading under which fall a variety of evaluative concerns." I use Smith's approach as a general guideline to discuss mental health, employing "mental health" as an overall umbrella term for psychological distress, psychological well-being, mental illness, and burnout.

Barling and Cloutier (2017) explore myriad mental health challenges, including subclinical depressive symptomology, anxiety, sleep problems, alcohol use, personality disorders, insecure and anxious attachment, and early exposure to aggression. In contrast, I explore more common conceptualizations of workplace mental health—burnout, stress, general mental distress in the form of depression, anxiety and reduced well-being, and sleep—to provide a narrower focus of research on negative mental health concerns. Previous reviews have already focused exclusively on topics such as leader psychopathy (Landay et al., 2019), and so these topics remain outside the scope of this review to not be redundant.

The Systematic Review

Upon conducting a systematic review of the leader mental health literature, I found 33 studies that explicitly examined mental health within the context of leaders. Although this body of work alone does not provide a substantive understanding of the topic, by systematically examining the current state of the field, we can conclude that there does appear to be some

(albeit limited) research on the topic. Notably, Barling and Cloutier (2017) limit their investigation by focusing on the outcomes of leader mental health, specifically the impact of leader mental health on the leader's own leadership behaviours. Though an important question of interest, this disregards the work done on other aspects of leader mental health (e.g., the leader's own experience of mental health and possible antecedents for mental ill-health) that are absent from Barling and Cloutier's (2017) study. Thus, focusing on outcomes rather than the experience of mental ill-health represents an incomplete view of the full picture of leader mental health.

The current paper provides an overview of the present state of research on leader mental health, including both antecedents and consequences, to broaden our understanding of this complex topic. While leaders and subordinates may experience similar risk factors for poor mental health, such as increased job demands, this review seeks to define the specific determinants of leader mental health (via the first research question: *What are the predictors of leader mental health?*) and to address whether leader mental health differs sufficiently from subordinate mental health to necessitate its own field of study (via the second question: *Do leaders have better or worse mental health than employees at other levels?*).

Systematic Review Methods

Search Strategy

To answer the paper's two central research questions, I searched the literature on leader mental health for studies within the context of these mental health issues and their various synonyms: *stress, sleep, anxiety, suicide, depression,* and *burnout*. These issues have validated measures and are widely studied in organizational psychology. To examine leadership, I conducted a search for multiple types of leadership positions and their various synonyms:

supervisor, leader, executive, CEO, chairman/chairwoman/chairperson, president, director, manager, and *administrator.*

I searched for these two main concepts—leaders and mental health—across four scholarly information sources: Medline (via Ovid; 1946 to March 7, 2019), APA PsycInfo (via Ovid; 1806 to March 7, 2019), Business Source Complete (via EBSCO; 1886 to March 8, 2019), and the following indexes from Web of Science Core Collection (Science Citation Index-Expanded, 1900 to March 7, 2019; Social Sciences Citation Index, 1900 to March 7, 2019; Arts & Humanities Citation Index, 1975 to March 7, 2019). Comprehensive search strategies were created for each database, incorporating subject headings and free-text terms. Database operators such as truncation and proximity operators were used to optimize the search to balance comprehensiveness and specificity. I limited the search to academic/scholarly studies, and excluded letters and comments where possible. The line-by-line search strategies for all databases are available in the supplementary information (see Appendix B). Results from each database search were exported as RIS or txt files, and deduplicated manually in EndNote X8. Moreover, I scanned the reference lists of the included studies.

Eligibility Criteria

I included studies that were in English, were published in peer-reviewed scholarly journals, included a population of leaders, and included quantitative results dealing with an aspect of mental health. Studies that did not clearly identify the studied population as leaders were still included if it appeared likely that the study might break down the population by job or occupation. These were then screened for inclusion of leaders during the full-text screening stage.

To simplify my measures of mental health and not conflate problem behaviours with mental health, I did not include alcohol or drug problems as a mental health variable, and studies that only examined alcohol or drug abuse were not included. To ensure high-quality, reliable results, studies were excluded if the sample size was fewer than 100 people. Additionally, studies were excluded when only case managers or religious or education leaders were examined to ensure that organizational leaders were the target of study. This process yielded 4,935 usable studies.

Selection Process

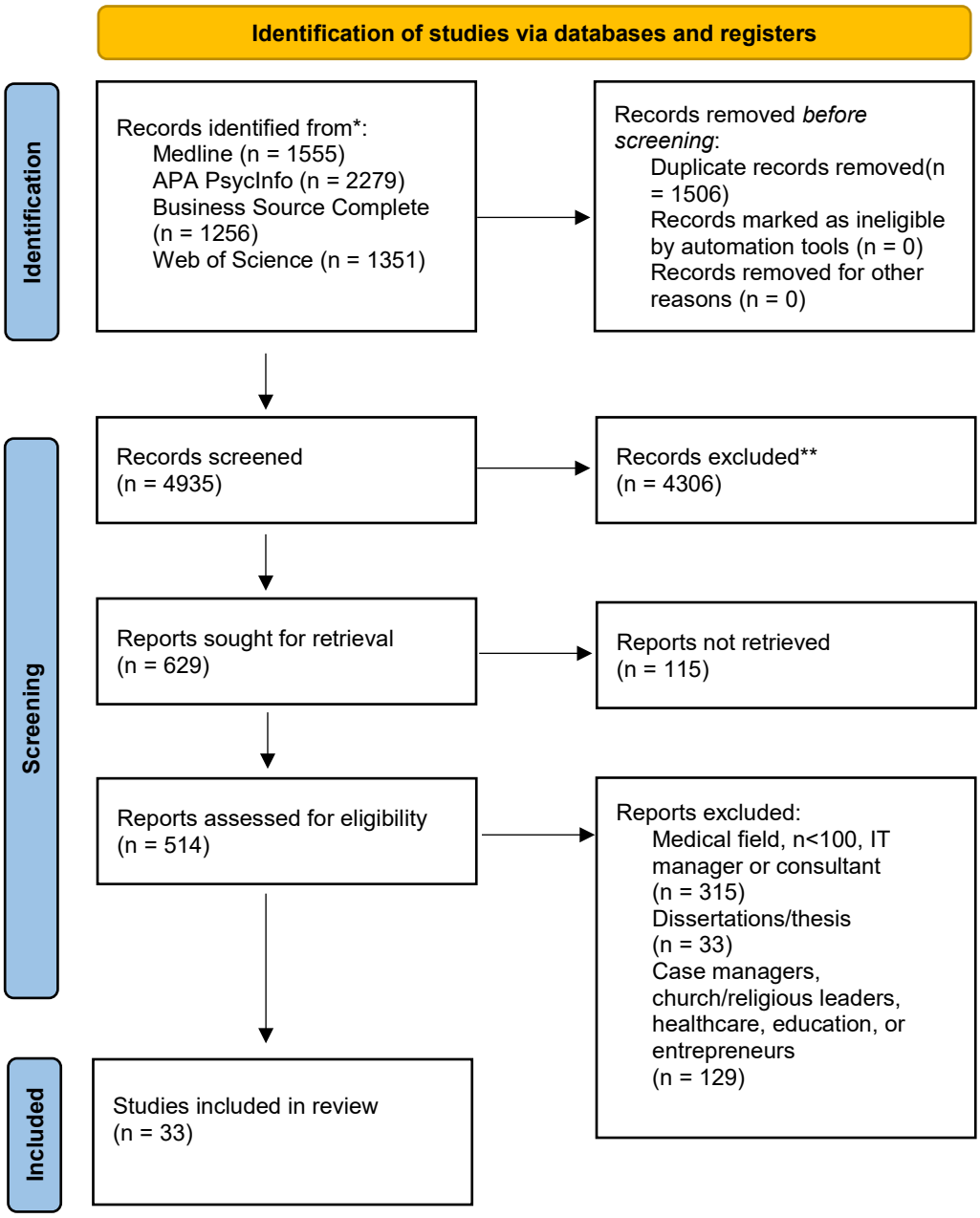
Two reviewers independently read the titles and abstracts of the 4,935 studies to exclude any that did not meet the above criteria. The title-abstract screening process was first piloted; this involved the two reviewers reading a sample of 50 study titles and abstracts, and making a decision to include or exclude for each, then comparing their decisions to ensure similar methods and similar interpretations of criteria were being applied to each record. When the reviewers did not agree on whether a study should be included, they reviewed the title/abstract together in order to come to a consensus. The title-abstract screening was done in Microsoft Excel. This resulted in 514 potential usable studies.

The full texts of 514 studies were obtained and read independently by the same two reviewers in order to determine their relevance to the research questions and pre-specified eligibility criteria. Any disagreements were again reviewed together in order to reach a consensus. After this evaluation of the full-text studies, 33 studies remained for inclusion in the systematic review. Data extraction was carried out by two individuals. Data was extracted to Excel, and included the following categories of information: authors, participants, sample size,

study design, operationalization of mental health and leadership, and key results. See Figure 3 for the PRISMA diagram (Page et al., 2020).

Figure 3

PRISMA Flow Chart



Results

Table 7 contains detailed results for each of the 33 papers included, and contains information on the authors, participants, sample size, study design, operationalization of mental health and leadership, and summary of key results. Sample sizes ranged from 105 to 58,501 participants, with a mean sample size of 2,375.32. To provide more narrative context for the results of this systematic review, below I offer a qualitative overview of the same (see Table 8).

Predictors of Leader Mental Health

Burnout

In line with Karasek's (1979) job demand-control model, the most popular model in organizational behaviour for examining mental health, role clarity (Mirvis et al., 1999), role conflict (Becherer et al., 2000; Mirvis et al., 1999; Sharma, 2007), resource adequacy (Mirvis et al., 1999), daily hassles (Fry, 1995), responsibility (Dolan, 1995), role stagnation (Sharma, 2007), and work overload (Dolan, 1995) were all shown to relate to leader burnout, with role conflict having the strongest effect (r = .42 – .52). At the same time, situational factors such as organicity and environmental hostility (Becherer et al., 2000), and board interference and board enhancement (Olinske & Hellman, 2017), which are more specific to leadership, were also found to be related to leader burnout. Organicity is the extent to which an organization is structured in an organic way, with open modes of communication, informal control, and a hierarchy based on expertise rather than authority, and is negatively related to burnout (Becherer et al., 2000). Environmental hostility goes beyond the organization itself, and relates to hostile external environments, such as "precarious industry settings, intense competition, harsh, overwhelming business climates, and the relative lack of exploitable opportunities" (Becherer et al., 2000, p. 30). Board interference refers to the extent to which leaders perceive that the board of directors

Table 7

Overview of Studies

Author	Participants	Level of Hierarchy	Method	Mental Health Measure	Comparison to Other Employees	Key Findings
BURNOUT						
Becherer, Halstead, & Maurer (2000)	215 small business presidents	Presidents	Cross-sectional	Burnout (measured with MBI)	No	44% of burnout accounted for by organicity, proactivity, role conflict, age, and environmental hostility
Björklund et al. (2013)	1088 Swedish managers	Managers	Cross-sectional	Burnout (measured with emotional exhaustion from Oldenburg Burnout Inventory)	Yes	Women were at a higher risk of emotional exhaustion than men. In particular, burnout was more common in lower-level female managers than higher level female managers.
Dolan (1995)	224 private sector senior executives	Senior executives	Cross-sectional	Burnout (measured with MBI)	No	Situational factors more predictive for emotional exhaustion, and personal factors more predictive of depersonalization
Fry (1995)	Study 1: 33 female executives, study 2: 36 female executives, study 3: 37 female executives	Executives	Cross-sectional	Burnout (measured with MBI)	No	Study 1: Perfectionism significantly positively related to burnout. As daily hassles increase, burnout in highly perfectionist women increased more rapidly than for less perfectionist women. Study 2: strong positive relationships between daily hassles and burnout, and a strong negative relationship between humor and burnout. Study 3: Significant interaction of daily hassles and optimism on burnout
Hyvönen et al. (2015)	806 Finnish national labor union managers	Middle and top managers	Cross-sectional	Burnout (measured with Bergen Burnout Indicator)	Yes	Career-ending goals related to higher burnout, and goal conflict related to higher burnout. No relationship between managerial level and burnout.
Mirvis, Graney, & Kilpatrick (1999)	302 VA leaders	Directors, associate medical center directors, and chiefs of staff	3 mailed surveys over 8 years (1989, 1992, and 1887)	Burnout (measured with MBI)	Yes	Burnout increased over the 8-year period, particularly lack of personal accomplishment and emotional exhaustion. Leaders with mid to high levels of burnout reported less role clarity, more role conflict, and less resource adequacy. There was no relationship between leadership level and burnout.
Olinske & Heilman (2017)	140 executive directors of nonprofit organizations	Executive directors	Cross-sectional	Burnout (Oldenburg Burnout Inventory (OLBI))	No	Board interference and board enhancement related to disengagement and emotional exhaustion
Roche, Haar, & Luthens (2014)	590 managers	Managers	Two waves, with time gap between 2-4 weeks	Burnout (measured with MBI)	No	Mindfulness and psychological capital related to emotional exhaustion and cynicism

Sharma (2007)	300 Indian executives	Middle and senior executives	Cross-sectional	Burnout (measured with Sharma Burnout Scale)	No	Stress personality most important predictor of burnout. Other determinants include role expectation conflict, role stagnation, personal inadequacy, and emotional competence
Simpkins & Lemyre (2018)	2,314 Canadian public sector senior executives	Senior executives	Cross-sectional	Burnout (only cynicism component of MBI)	No	Psychological stress and stewardship related to cynicism
STRESS						
Begley & Boyd (1992)	235 Smaller Business Association of New England CEOs	CEOs	Cross-sectional	Work stress (measured with adapted scale from Parasuraman & Alutto, 1984)	No	Mastery and religious beliefs were significantly negatively related to work stress, and work stress was positively related to anxiety, depression, and physical complaints.
Cavanaugh et al. (2000)	1,886 high-level managers, of which 841 returned turnover survey	High-level managers	Time-lagged (approximately 1 year)	Challenge-related stress and hindrance-related stress (measured with own scale)	No	Female managers reported higher levels of challenge-related stress than male managers, but gender was not related to hindrance-related stress. After controlling for gender and personality, both challenge-related stress and hindrance-related stress positively predicted job satisfaction. Challenge-related stress was negatively related to job search, and hindrance-related stress was positively related to job search. Hindrance-related stress positively predicted turnover, but the relationship between challenge-related stress and turnover was non-significant.
Cooper (1984)	1065 senior or executive officers in 10 countries	Senior or executive officers	Cross-sectional	Job Stress (measured with Cooper Job Stress Questionnaire; Cooper, 1981)	No	Different countries seem to have different stressors.
Copeland & Kirsch (1995)	108 American athletic directors	Directors	Cross-sectional	Occupational stress (unique scale)	No	Budget demands and hiring were perceived as almost always stressful.
^Crank et al. (1993)	1,427 police executives	Executives	Cross-sectional	Work stress (measured with four items from Work-Stress Scale; Cullen et al., 1985)	No	Level of education was negatively related to perceptions of stress. Control over the hiring process and autonomy were negatively related to role stress. Sheriffs reported higher levels of stress than police chiefs.
^Crank et al. (1995)	1,427 police executives	Executives	Cross-sectional	Role stress (measured with composite 6-item index; Cullen et al., 1985)	No	Legitimacy issues were positively related to role stress, and organizational complexity was negatively related to role stress. The selection process was related to role stress.
Ho (1995)	143 Singaporean banking executives	Executives	Cross-sectional	Stress (measured with unique sources of stress scale)	No	Personality type related to stress (Type A executives reporting higher stress than Type B executives).
Judge, Boudreau, & Bretz (1994)	1,309 male executives	Executives	Cross-sectional	Job stress (unique scale)	Yes	Work-family conflict and family-work conflict were both positively related to job stress. Organizational success was negatively related to job stress, and dual income was positively related to job stress. Job level was positively related to job stress, such that male executives who held high-level jobs reported higher levels of job stress.

Kawaharada et al. (2007)	8,263 local public Hokkaido employees	Seven occupational groups: managers, production workers/laborers, professionals/technicians, protective service workers, transport/communication workers, clerical workers, and service workers	Cross-sectional	Occupational Stress (measured with Japanese version of Job Demand-Control Questionnaire (JDCQ) and Effort-Reward Imbalance Questionnaire (ERIQ))	Yes	With the JDC model of stress, male managers were less likely to be in the high occupational stress group compared to male clerical workers, transport/communication workers, and protective service workers. For women, service workers were most likely to be in high occupational stress group. Under the ERI model, male managers once again were less likely to be in the high occupational stress group compared to male professionals/technicians, transport/communication workers, clerical workers, and protective service workers. For women, managers were the most likely to be in the high stress group.
Mukherjee (2012)	400 Indian SAIL executives	Executives	Cross-sectional	Occupational stress (measured with Occupational Stress Index; Singh & Srivastava, 1984)	No	Occupational stress was significantly negatively related to job involvement and life orientation.
Rogers, Li, & Ellis (1994)	146 female US senior executive service employees	Senior executives, managers, other supervisory positions	Cross-sectional	Stress (measured with Job-Related Tension Index (JRTI); Kahn et al., 1964)	No	Performance, workload, organizational design and responsibility, and decision-making were related to work stress. The highest stressed exhibited high stress due to workload, work quality, demands from others, family responsibilities, and fear of making the wrong decision.
Sharma & Singh (2016)	600 Punjabi marketing executives	Executives	Cross-sectional	Job stress (measured with unique scale from Sharma & Devi, 2011)	No	Lack of clarity, growth, and work-life imbalance were the strongest predictors of stress.
*Sherman et al. (2012)	231 Boston community members and leaders	Middle- to high-level leaders and community members	Cross-sectional	Stress (measured with cortisol from saliva sample at ~3:30pm)	Yes	Leaders had significantly lower levels of cortisol, and thus, lower levels of stress, than non-leaders.
Verma, Bhal, & Vrat (2013)	302 Indian call center women executives	Executives	Cross-sectional	Stress (measured with burnout and anxiety items from Tate et al. (1997))	No	Gender-sensitive practices related to lower levels of stress. Stress is negatively related to organizational commitment.
Worrall & Cooper (1995)	1,040 senior decision makers	Chairman, chief executive/managing director, proprietor/partner, other director	Cross-sectional from the West Midlands Business Survey	Stress (measure unclear)	No	60% of respondents considered their job to be moderately stressful, and 29% reported it as extremely stressful. The main causes of stress were volume of work, competitive pressures, and performance targets.

MENTAL HEALTH/DISTRESS: DEPRESSION, ANXIETY, DISTRESS & WELL-BEING						
Begley & Boyd (1992)	235 Smaller Business Association of New England CEOs	CEOs		Anxiety & depression	No	Results suggest an interaction of optimistic action and work stress on anxiety. Increased stress had less of an impact on anxiety when the CEO held high optimistic action. Additionally, mastery and religious beliefs were significantly negatively related to anxiety and depression.
Cooper (1984)	1065 senior or executive officers in 10 countries	Senior or executive officers	Cross-sectional	Mental ill-health (measured with the Middlesex Hospital Questionnaire, which was more recently changed to the Crown-Crisp Experiential Index (CCEI); Crown & Crisp, 1979)	No	Different countries seem to have different levels of mental health, but lack of autonomy was the most common predictor of mental ill-health across countries, followed by work overload.
Ho (1995)	143 Singaporean banking executives	Executives	Cross-sectional	Psychological well-being (measured with the General Well-Being Questionnaire (GWBQ))	No	Executives in the finance industry reported the lowest levels of psychological well-being, and executives in the banking industry reported the highest levels.
Hsu et al. (2016)	365 Taiwanese executive-level employees	Executives	Cross-sectional	Depression (measured with Chinese version of CES-D)	No	Workplace justice and employment security were significantly negatively related to depression, and work demands were positively related to depression. Colleague support was negatively related to depression scores. Age was negatively related to depression.
McCormick & Cooper (1988)	220 New Zealand senior executives	Senior executives	Cross-sectional	Mental health (measured with subscales of depression, anxiety, and psychosomatic tendencies of Crown-Crisp Experiential Index (CCEI); Crown & Crisp, 1979)	No	The New Zealand executives displayed low levels of mental distress in comparison with their international counterparts. In particular, threat of job loss was the best predictor of mental health, followed by family conflict.
Roche, Haar, & Luthens (2014)	590 managers	Junior, middle, and senior managers	Two waves, with time gap between 2-4 weeks	Anxiety & Depression (measured with shortened version of Warr's (1990) anxiety–contentment and depression–enthusiasm scales (see Mullarkey, Wall, Warr, Clegg, & Stride, 1998))	Yes	Mindfulness was significantly negatively related to anxiety and depression in junior, middle and senior managers. A quick investigation into the means of managers would suggest very little difference in levels of anxiety and depression as a function of managerial level. There is a slight negative relationship, where senior managers are less anxious and depressed than middle managers, who are, in turn, less anxious and depressed than junior managers.
*Sherman et al. (2012)	231 Boston community members and leaders	Middle- to high-level leaders and community members	Cross-sectional with physiological measures	Anxiety (measured with Trait Anxiety Inventory (Spielberger, 1983))	Yes	Leaders experienced lower levels of anxiety than non-leaders.

Simpkins & Lemyre (2018)	2,314 Canadian public sector senior executives	Senior executives	Cross-sectional	Psychological distress (measured with GHQ)	No	Psychological stress accounted for significant variance in psychological distress. Stewardship was negatively related with psychological distress.
Singh et al. (2016)	210 private sector executives	Executives	Cross-sectional	Depressive symptoms (measured with CES-D)	No	Total organizational role stress was positively related to depressive symptoms, but, specifically, the dimensions of role ambiguity and role conflict are positively correlated with depressive symptoms (not role overload).
Welch et al. (1999)	58,501 British postal workers	Four occupational grades: manual, clerical, middle management, and senior management.	Cross-sectional	Mental health (measured with GHQ-12)	Yes	There were significant linear trends between mental health and occupational grade. For both men and women, GHQ scores rose with higher occupational grade, where middle managers experienced greater distress (higher GHQ scores) than clerical workers, who experienced greater distress (higher GHQ scores) than manual workers. However, this linear trend did not continue for senior managers. Middle managers reported greater distress (higher GHQ scores) than senior manager scores.
SLEEP						
Gadinger et al. (2009)	424 German, Austrian, and Swiss executives and managers	Middle and top executives	Cross-sectional	Sleep quality (measured with unique scale)	No	Main effects: Social support positively predicts sleep quality. Interactions: The combination of high job control and high social support has the strongest buffering effect on the adverse effects of job demands on sleep quality. Additionally, gender seemed to have an effect on this interaction, where women are more affected than men.
Partinen et al. (1984)	162 municipal directors	Directors	Cross-sectional	Insomnia (measured with unique scale)	Yes	Directors typically had lower complaints of insomnia in comparison with different occupations.
Svetieva et al. (2017)	384 senior-level workers	Senior level workers: managers, directors, executives, and individual contributors	Cross-sectional	Sleep patterns (measured with unique scale), and sleep problems (adapted from PROMIS Sleep Disturbance item bank, Buysse et al., 2010)		Problems of sleep deprivation and poor sleep quality are prevalent all across the leadership spectrum. The inability to psychologically detach from work and execute work-life boundaries was one of the biggest predictors of sleep problems. Leader level was not a significant predictor of sleep problems.

Note: *Sherman et al. (2012) is one paper with two different studies; ^Crank et al. (1993, 1995) use the same sample but different dependent variables.

Table 8

Overview of Results

	Burnout	Stress	Mental health/distress	Sleep
Situational Factors	• Role clarity (-) • Role conflict (+) • Role stagnation (+) • Resource adequacy (-) • Daily hassles (+) • Responsibility (+) • Work overload (+) • Organicity (-) • Environmental hostility (+) • Board interference (+) • Board enhancement (+)	• Workload (+) • Selection or hiring processes (+) • Budget demands (+) • Decision-making (+) • Competitive pressures (+) • Performance targets (+) • Control (-) • Autonomy (-) • Lack of clarity (+) • Legitimacy issues (+) • Organizational complexities (+) • Organizational design (+) • Organizational success and growth (-) • Gender-sensitive practices (-) • Country	• Work overload (+) • Word demands (+) • Role ambiguity (+) • Role conflict (+) • Autonomy (-) • Employment security (-) • Colleague support (-) • Justice (-) • Industry	• Social support (+) • Job demands (-) • Job control (+) • Occupational group
Personal Factors	• Stress personality (+) • Perfectionism (+) • Orientation to self (+) • Doubts and ambiguities (+) • Orientation for security (+) • Psychological stress (+) • Career-ending goals (+) • Goal conflict (+) • Humor (-) • Self-esteem (-) • Proactivity (-) • Emotional competence (-) • Mindfulness (-) • Psychological capital (-) • Stewardship (-) • Age (-)	• Personality type • Education level (-) • Work-family and family-work conflict (+) • Dual income families (+) • Work-life imbalance (+) • Mastery (-) • Religious beliefs (-)	• Family conflict (+) • Stress (+) • Mindfulness (-) • Stewardship (-) • Mastery (-) • Religious beliefs (-) • Age (-)	

interferes with the daily operations of the organization, and board enhancement refers to the extent to which the executive director is given freedom and support from the board of directors (Olinske & Hellman, 2017). Board interference and board enhancement were more strongly related to leader burnout (r = -.49 and .45 respectively) than organicity or environmental hostility (r = -.26 and .29 respectively), suggesting that the relationship between the leader and the board of directors has a substantial impact of leader burnout. In summary, the aspects of the work environment that affect a leader's mental health are not solely based on the leader's job characteristics. Rather, the organizational structure, the external environment, and, in particular, the interactions with the board of directors also impact leader burnout.

In addition, multiple studies in this review focused on personal factors that may affect burnout: stress personality (Sharma, 2007), perfectionism (Fry, 1995), orientation to self (Dolan, 1995), doubts and ambiguities (Dolan, 1995), orientation for security (Dolan, 1995), psychological stress (Simpkins & Lemyre, 2018), career-ending goals (Hyvönen et al., 2015), and goal conflict (Hyvönen et al., 2015) were positively related to burnout. Specifically, psychological stress (r = .60) had the strongest relationship with burnout. Humour (Fry, 1995), self-esteem (Dolan, 1995; Sharma, 2007), proactivity (Becherer et al., 2000), emotional competence (Sharma, 2007), mindfulness (Roche et al., 2014), psychological capital (Roche et al., 2014), stewardship (Simpkins & Lemyre, 2018), and age (Becherer et al., 2000; Hyvönen et al., 2015) were all negatively related to burnout for leaders. Specifically, humour (r = -.67) had the strongest negative relationship with burnout.

***Critical evaluation*.** Overall, the results from these studies suggest that leaders experience burnout due to a combination of situational and personal factors. However, this literature does not provide insight into whether situational or personal factors are more likely to contribute to

greater levels of burnout. Only one study (Dolan, 1995) suggested that situational factors are more significant predictors of burnout compared to personal factors. Rather than focusing on either personal or situational factors in isolation, Dolan (1995) provided a conceptual model of burnout including personality, job stressors, and organizational stressors, allowing for a comparison of personal and situational factors. Additionally, Dolan (1995) offered an in-depth examination of burnout by separating its three factors: emotional exhaustion, depersonalization, and personal accomplishment. His results suggest that for emotional exhaustion, the strongest predictors are the job stressors of responsibility (r = .53), work overload (r = .51), and doubts and ambiguities (r = .43), as well as the personal factors of self-esteem (r = .48), group versus self-orientation (r = .45), and risk versus security orientation (r = .44). For depersonalization, the strongest predictors are the job stressor of responsibility (r = .30) and the personal factors of group versus self-orientation (r = .35) and self-esteem (r = .30). For personal accomplishment, the strongest predictors are the job stressor of role ambiguity (r = -.22) and the personal factor of risk versus security orientation (r = -.21). In this way, Dolan's (1995) work highlights the importance of personality, suggesting that to understand burnout in leaders, we need more work that examines both situational and personal risk factors simultaneously. This finding counters the job demand-control model (Karasek, 1979), which only takes into consideration situational factors, specifically job demands, job resources, and job control.

In comparison, Mirvis et al.'s (1999) findings provide a comprehensive examination of a variety of predictors of burnout, but their analysis and results are underdeveloped: they report using "standard statistical methods" (p. 356), yet it is unclear what these statistical methods are. Further, the authors simply report that "no significant associations…were evident" (p. 358) or that the "analysis…documented statistically significant differences" (p. 359), without reporting

the statistics or effect sizes. It is not sufficient to simply state something to be significant or non-significant without additionally reporting the statistical tests and effect sizes. As a result, in its current form, the study fails to deliver a detailed analysis, which hinders our understanding and use of the findings.

Stress

Similar to those of burnout, determinants of leader stress included both situational and personal factors. Situational factors such as workload (Rogers et al., 1994; Worrall & Cooper, 1995), selection or hiring processes (Copeland & Kirsch, 1995; Crank et al., 1995), budget demands (Copeland & Kirsch, 1995), decision-making (Rogers et al., 1994), competitive pressures (Worrall & Cooper, 1995), performance targets (Rogers et al., 1994; Worrall & Cooper, 1995), control (Crank et al., 1993), autonomy (Crank et al., 1993), and lack of clarity (Sharma & Singh, 2016) were associated with leader stress, aligning with the job demand-control model (Karasek, 1979).

In addition, the literature suggested there were several situational factors that predicted leader stress that were not aligned with the job demand-control model (Karasek, 1979), such as legitimacy issues (Crank et al., 1995), organizational complexities (Crank et al., 1995), organizational design (Rogers et al., 1994), organizational success (Judge et al., 1994), growth (Sharma & Singh, 2016), gender-sensitive practices (Verma et al., 2013), and country (Cooper, 1984). Specifically, gender-sensitive practices had the strongest relationship with stress (r = -.25).

In terms of personal factors, personality type (Ho, 1995), education level (Crank et al., 1993, 1995), work-family and family-work conflict (Judge et al., 1994), dual-income families (Judge et al., 1994), work-life imbalance (Sharma & Singh, 2016), mastery (Begley & Boyd,

1992), and religious beliefs (Begley & Boyd, 1992) were all related to leader stress. Specifically, work-family conflict had the strongest relationship with stress (r = .44).

Critical evaluation. Although there appears to be a sufficient body of research on the topic of leader stress, the results are not definitive. The vast majority of these studies did not fully measure the relationship between the situational or personal factors and stress: rather, they relied on frequencies, making it difficult to compare effect sizes to determine the most important predictor, or even to compare situational and personal factors. This greatly limits our understanding of how leaders experience stress, as, unlike with burnout, a further investigation into these comparisons is not possible.

Further, rarely does more than one study investigate the same antecedent construct or attempt to replicate previous findings. For example, workload has been vastly studied in organizational psychology, but only two studies (Rogers et al., 1994; Worrall & Cooper, 1995) have explored the relationship between workload and leader mental health. Other studies investigated more specific demands, such as hiring processes or budget demands, but failed to explore these in comparison to general leader workload.

However, Kawaharada et al.'s (2007) examination of occupational stress offers a unique glimpse into the relationship among various predictors and occupational stress. The authors examined 8,029 employees in a multitude of occupational groups and explored occupational stress within the context of both the job demand-control model and the effort-reward imbalance model (Siegrist, 1996). While the job demand-control model remains the most popular model for examining mental health, the introduction of the effort-reward imbalance model and the comparison between the two provide a unique understanding of the concept of stress, particularly given the different effects. Overall, the studies on determinants of leader stress suggest that a

variety of job demands have a negative effect on leader mental health, but they have so far failed to rule out alternative explanations or investigate and compare multiple predictors. Future research must be able to explicitly and carefully define the job demands of leaders.

Mental Health/Distress: Depression, Anxiety, and Well-Being

Like those on burnout and stress, the studies examining mental distress also suggest situational and personal factors contribute to leader mental distress. In terms of situational factors, job control (Simpkins & Lemyre, 2018), work overload (Cooper, 1984), work demands (Hsu et al., 2016), role ambiguity (Singh et al., 2016), role conflict (Singh et al., 2016), autonomy (Cooper, 1984), employment security (Hsu et al., 2016; McCormick & Cooper, 1988), colleague support (Hsu et al., 2016), justice (Hsu et al., 2016), and industry (Ho, 1995) were all associated with mental distress.

In terms of personal factors, family conflict (McCormick & Cooper, 1988), stress (Begley & Boyd, 1992; Simpkins & Lemyre, 2018), mindfulness (Roche et al., 2014), stewardship (Simkins & Lemyre, 2018), mastery (Begley & Boyd, 1992), religious beliefs (Begley & Boyd, 1992), position (Roche et al., 2014; Welch et al., 1999), and age (Hsu et al., 2016) were associated with mental distress.

Critical evaluation. Once again, many studies did not report sufficient statistical analysis to complete a comparison of effect sizes. However, Begley and Boyd (1992), Simkins & Lemyre (2018), and Roche et al., (2014) provided statistical analysis to allow for a discussion on effect sizes. The strongest relationships were the personal factors of work stress and mastery: work stress and anxiety and depression (r = .56 and -.43 for anxiety and depression, respectively), followed by mastery (r = -.41 and -.51, respectively; Begley & Boyd, 1992). Mindfulness was also negatively related to anxiety and depression in senior managers (r = -.32 and -.31 for anxiety

and depression, respectively) and in junior managers (r = -.30 and -.30 respectively for anxiety and depression in sample 1, and r = -.36 and -.26 for sample 2; Roche et al., 2014). Religious beliefs were weakly related to anxiety and depression (r = -.18 and -.12, respectively; Begley & Boyd, 1992). In terms of situational factors, job control was strongly related to psychological distress (r = -.39), as was stewardship (r = -.28) (Simpkins & Lemyre, 2018). Although I was not able to compare other effect sizes, these results suggest that leader mental distress is due to a combination of personal and situational factors, although the personal factors of work stress and mastery appear to be the most highly related to leader mental distress.

Additionally, there were some concerns with results of some studies. McCormick and Cooper (1988), and Cooper (1984) examined mental health with the Crown-Crisp Experiential Index (CCEI: Crown & Crisp, 1979). The CCEI, originally known as the Middlesex Hospital Questionnaire (MHQ), was designed as a measure of neurotic symptomatology, and consists of six subscales: depression, free-floating anxiety, phobic anxiety, somatic anxiety, obsessionality, and hysteria. Results can be used for each subscale, or can be combined for a total score of psychoneurotic pathology (Birtchnell et al., 1988). Although this is not necessarily a bad thing, combining the scales loses important information about mental health. McCormick and Cooper (1988), and Cooper (1984) combined the subscales into a general measure of mental distress, and it was not possible to separately ascertain separate results for anxiety and depression. Anxiety and depression are highly comorbid and occur concurrently (Mineka et al., 1998), with 45.7% of people who experience major depressive disorder in their lifetime also experiencing one or more anxiety disorders. However, it is important to emphasize that many people experience anxiety or depression on its own; 54.3% of people who experience major depressive disorder in their lifetime will not experience any anxiety disorder. They can and do occur separately, and it would

provide a more complete and complex understanding of leader mental health if they could be separated and evaluated separately.

However, Welch et al.'s (1999) national examination of postal workers provides one of the clearest and most comprehensive understandings of occupational grade and mental distress. The authors surveyed 58,501 postal workers, 29% of the total postal employee population, an impressive feat. They examined self-reported psychological health (measured with the GHQ-12, the General Health Questionnaire) along with employment grade (manual worker, clerical worker, middle management, and senior management). They were able to demonstrate that GHQ-12 scores rise linearly from manual to clerical to middle management (even when adjusting for age, gender, job satisfaction, and coping) – as an employee rises in rank through the postal service up to middle management, their mental health deteriorates. However, this linear trend does not continue to senior management. Those in senior management displayed lower GHQ scores than those in middle management, suggesting that employees in higher management have better mental health than those in middle management. This finding holds even when adjusted for age, gender, job satisfaction, and coping. Though cross-sectional in nature, the extremely large sample size enables confidence in the results and the general trend of worse mental health for employees in middle management positions.

Sleep

Only three studies directly investigated leaders experiencing sleep problems (Gadinger et al., 2009; Partinen et al., 1984; Svetieva et al., 2017), and all three indicated that leaders suffer from sleep problems. Although many other researchers have investigated sleep problems and leadership (e.g., Barnes et al., 2015; Barnes et al., 2016; Guarana et al., 2017), the focus of these studies is often how leaders experiencing a lack of sleep impact their employees: the focus is on

the employee, not the leader. The present study is focused on the leader's experience of sleep problems, and how sleep problems might differ among occupational groups and leadership levels.

Partinen et al. (1984) focused on examining complaints of insomnia in a variety of occupational groups, including bus drivers, teachers, nurses, laborers, cleaners, construction workers, dentists, physicians, electricians, mechanics, social workers, and organizational directors. Male directors typically had one of the lowest frequencies of sleep complaints: 1.8% of directors complained about waking up too early without being able to fall back asleep, 3.7% of directors complained about having difficulty falling asleep, and 7.4% of directors complained about waking up at least three times per night, which was much lower than other occupation groups (e.g., 9.1% of male construction workers complained about waking up too early without being able to fall back asleep, 18.9% of male bus drivers complained about having difficulty falling asleep, and 28.1% of male laborers complained about waking up at least three times per night, the highest complaint frequency of any group). The only occupational groups reporting lower frequencies of complaints were male physicians complaining about waking up at least three times per night (1.6%), male physicians complaining about waking up too early without being able to fall back asleep (1.6%), and female nurses in outpatient wards physicians complaining about waking up too early without being able to fall back asleep (1.2%). However, female directors were not reported, and predictors of insomnia were not examined.

Gadinger et al. (2009), on the other hand, focused more on predictors and possible moderators of sleep quality among German-speaking executives in Germany, Austria, and Switzerland. They drew heavily on the job demand-control-support framework (Karasek, 1979; Johnson & Hall, 1988), focusing on job demands, job control, and social support. Specifically,

they examined the four-way interaction of job demands, job control, social support, and gender. Although the only significant main effect was that of social support predicting sleep quality, the interaction results support the buffer hypothesis of the job demand-control-support framework: sleep quality is most affected by high job demands, low job control, and low social support. High job control and high social support help buffer the effects of high job demands on sleep quality. This effect was more pronounced for women, who experience greater adverse effects on sleep quality than men.

Svetieva et al. (2017) examined sleep patterns and sleep problems among 384 senior-level employees (including managers, directors, executives, and others). Their results show that leaders suffer from sleep deprivation: 42% reported getting six hours of sleep or fewer—a cause for concern, given the crucial role of sleep in attention, decision-making, and problem solving. The most common psychological factor contributing to sleep problems was work-related thoughts; in particular, the inability to detach from work and execute work-life boundaries was the biggest predictor of sleep problems.

Critical evaluation. Gadinger et al.'s (2009) examination and test of the job demand-control-support model provides a strong theoretical basis from which to examine sleep. Rather than only testing small components of the model, the authors test the model in full among 424 middle and top executives. While it was not possible for the authors to separate lower, middle, and upper management results, their exploration of the interaction effect offers compelling evidence that leaders suffer from sleep problems in a similar fashion to employees. In short, high job demands, low control, and low support are contributing to poor mental health in leaders, especially regarding their sleep quality.

Although Svetieva et al. (2017) did investigate the impact of leader level on sleep problems, the authors were still narrowly focused on leaders: they did not undertake comparisons with non-leader employees. Their finding that leader level is not significantly related to any sleep problem provides some evidence that perhaps leaders are susceptible to the same problems and concerns as their employees. However, without a true comparison with employees, the question of whether leaders suffer from more sleep problems than their employees cannot be answered.

Comparison Among Levels

My second research question asked: *Do leaders have better or worse mental health than employees at other levels?* To attempt to answer this answer question, I investigate studies that reported results for more than one occupational group (i.e., middle management vs. senior management, or leaders vs. other employees), or directly analyzed organizational levels in their analysis.

Burnout

Even though managerial level was examined in relation to burnout, the results remain inconclusive. Mirvis et al. (1999) and Hyvönen et al. (2015) found no relationship between leadership/managerial level and burnout. Yet Björklund et al. (2013), who examined leadership level in combination with gender, found that burnout was more common among lower-level female managers than among higher-level female managers. Despite the fact that these three studies have large sample sizes (Björklund et al., n = 1088; Mirvis et al., n = 302; Hyvönen et al., n = 806), they examined managerial level at just two levels (i.e., higher-level versus lower-level managers). This restricted range of occupation limits our understanding substantially, as we are unable to compare leaders to other occupational groups, such as general employees. The ways in which mental health is expressed and the predictors that affect it may differ dramatically across

organizational levels; for instance, non-leader employees may face different demands, altering the relationship between job demands and mental health. Further, this dichotomy also removes directors and more senior positions, which may also face different demands. As board interference and board enhancement only relate to directors, removing the most senior leader positions impedes our understanding of leader mental health. Likewise, if we only assess dichotomies of employees in leader positions (e.g., higher-level vs. lower-level managers), we fail to account for the complexity of organizational behaviour and again limit our understanding of the phenomenon of leader mental health. Thus, more research is needed to elucidate how burnout is experienced at different levels of the organization and how gender affects burnout at those different levels.

Stress

Three of the studies in this review investigated job level and its effect on stress. Judge et al. (1994) examined stress among male executives and found that job level was positively related to job stress, such that male executives who held higher-level jobs reported higher levels of job stress compared to lower-level jobs. This study only looked at executives (rather than leaders and employees), so there was a restricted range of job level. However, as the typical male executive was positioned two levels below the CEO, there was still some variation in job level among the executives examined. In contrast to Judge et al. (1994), Sherman et al. (2012) found that leaders had significantly lower levels of cortisol, and thus lower levels of stress, than non-leaders. Although these two studies used different measures of stress (self-reported stress vs. cortisol levels) and different populations (executives vs. leader/non-leader), the contradictory findings regarding job level suggest the need for additional research.

Kawaharada et al. (2007) expanded upon the number of levels examined by comparing stress in relation to job demands as well as effort-reward imbalance across seven occupational groups (managers, professionals/technicians, clerical workers, protective service workers, service workers, transportation/communication workers, and production workers/laborers) encompassing over 8,000 respondents. They assessed occupational stress using two measures: the Job Demand-Control Questionnaire (JDCQ) and the Effort-Reward Imbalance Questionnaire (ERIQ). When stress was assessed with the JDCQ, male managers were less likely to be in the high occupational stress group compared to male clerical workers, transport/communication workers, and protective service workers. Among female participants, service workers were most likely to be in the high occupational stress group. When stress was assessed with the ERIQ, male managers once again were less likely to be in the high occupational stress group compared to male professionals/technicians, transport/communication workers, clerical workers, and protective service workers. For the female group, conversely, managers were the most likely candidates to be in the high stress group. Hence, gender seems to affect the relationship between position and stress, as does the way in which stress is conceptualized.

Upon viewing these three studies together, it is difficult to form a conclusion about whether leaders experience more or less stress than employees, and whether higher-level leaders experience more or less stress than lower-level leaders. The conceptualization of stress varied across the studies (from subjective surveys to objective cortisol levels) as did the type of leader (from executives to leaders versus non-leaders, and across different occupational groups).

Mental Health/Distress: Depression, Anxiety, and Well-Being

Three studies examined the relationship between job level and mental distress. In the first, as previously discussed in regard to stress, Sherman et al. (2012) considered the cortisol

levels of leaders, and found that leadership level was associated with lower cortisol response and less self-reported anxiety among Boston community members and leaders. Their results suggest that having a strong sense of control inhibits the experience of stress and anxiety.

Second, Roche et al. (2014) split their sample into three managerial samples—junior managers, middle managers, and senior managers—but did not explicitly test the effect of position on anxiety and depression. Investigating mean effects between the three levels suggests little difference in levels of anxiety and depression as a function of managerial level; however, there is a slight negative relationship, where senior managers are less anxious and depressed than middle managers, who are, in turn, less anxious and depressed than junior managers.

Third, as noted in the discussion of studies inspecting predictors of mental health, Welch et al. (1999) examined the mental health of 58,501 British postal workers. Participants were categorized into four occupational grades: manual, clerical, middle management, and senior management. Using Goldberg's (1972) General Health Questionnaire (GHQ) as a measure of general mental health, the authors found significant linear trends between mental health and occupational grade. For both men and women, GHQ scores rose with higher occupational grade, where middle managers experienced greater distress (higher GHQ scores) than clerical workers, who experienced greater distress than manual workers. However, this linear trend did not continue for senior managers. Middle managers reported greater distress than senior manager scores, even after adjusting for age, gender, job satisfaction, and coping. These results suggest that managers may experience greater distress in comparison to their employees but only up to a point, as senior management seems to enjoy better mental health than middle management.

Although there are only three studies examining mental distress as a function of occupational level, these works provide important and useful information. For instance, Sherman

et al. (2012) find that perceived sense of control is associated with lower cortisol levels and lower self-reported anxiety. As such, future research should not only investigate the physiological aspects of stress as a function of occupational level but also explore the role of perceived sense of control. It is possible, for example, that two individuals at the same occupational level may perceive themselves as having very different levels of control, leading to different levels of mental health. In addition, Welch et al. (1999) use a very large sample size and a validated measure of mental distress that is used in clinical research. The results of this study indicate that different levels and types of leadership might have different associations with mental health. In light of the Sherman et al. (2012) study, it is possible that middle manager leaders do not have the same level of control as senior leaders, which results in more mental distress. A more granular investigation is needed to reveal the nuances of the relationship between leadership level and mental health.

Sleep

Only two of the studies on sleep investigated a comparison among levels of leaders. As mentioned above, Partinen et al. (1984) examined complaints of insomnia in a variety of occupational groups. In comparison to the other occupational groups, directors typically had a low percentage of sleep complaints: 1.8% of directors complained about waking up too early without being able to fall back asleep, 3.7% of directors complained about having difficulty falling asleep, and 7.4% of directors complained about waking up at least three times per night. Directors were not always the occupation with the rarest number of complaints (e.g., 1.6% of physicians complained of waking up at least three times per night in comparison with 7.4% of directors), but directors rarely reported sleeping complaints.

Svetieva et al. (2017) also examined the impact of leader level or type but found no significant relationship between type of leader (manager, manager of managers, senior manager, executive, or other) and any type of sleep problem, including quantity and quality of sleep.

Discussion

This review indicates that leaders suffer from mental health issues, including burnout, stress, depression, anxiety, mental distress and sleep problems, and that both situational and personal factors appear to affect leader mental health. Yet, these factors vary greatly, and few factors previously studied easily fall into occupational psychology health models, such as job demand-control or effort-reward imbalance. Further, the factors explored are different from those often studied in occupational psychology health studies, such as socioeconomic status, bullying, injustice, work-family conflict, and psychological detachment. In fact, none of the studies reviewed examined socioeconomic status, bullying, or psychological detachment and its relationship to leadership. The majority focused on job demands and control, although the nature of the job demands varied greatly, including work overload, budget demands, control, resource adequacy, and threat of job loss. Some situational factors, such as board interference or board enhancement naturally fit within a leader's role. But others, such as gender-sensitive practices, role conflict, and colleague support, do not seem to imply demands specific to leaders, which brings this discussion back to the paper's second research question.

Do leaders have better or worse mental health than employees at other levels? Based on the current research, I was unable to answer this question. Very little research has focused on comparing leaders to non-leaders or considering mental health at different leadership levels. The existing research does appear to suggest that there are advantages regarding mental health for those in senior leadership roles (Welch et al., 1999) or for those who perceive themselves as

having a strong sense of control (Sherman et al., 2012). However, for those in more mid-level leadership roles, it appears that leadership is associated with lower mental health (Welch et al., 1999). What is clear from this review is that more research is needed to better understand the relationship between leadership and mental health. Therefore, I present an agenda for future research in this vein, as follows.

An Agenda for Future Research

First, very few studies investigated what makes leadership a unique situation or role for examining mental health. In other words, if a study focuses on leader mental health, it should adequately explain the reason(s) for the sample examined. Leader job demands vary greatly (Hambrick et al., 2005) and without a comprehensive understanding of leaders' common demands, we cannot investigate their impact on leader mental health. If job demands do contribute to worse mental health, which ones are particularly impactful for leader mental health? Are there certain demands that leaders must attend to that other organizational members do not have to attend to? Is a sense of control more important for leaders as they face increasing job demands? Exploring and establishing this leadership context will be vital to establishing a better understanding of leader mental health.

Second, future research must compare leader mental health with the mental health of other employees, as past studies have yielded contradictory findings. For example, although Hyvönen et al. (2015) found no relationship between managerial level and burnout, Björklund et al. (2013) found some evidence that, at least for women, lower-level managers are at higher risk of burnout than higher-level managers. Regarding stress, Kawaharada et al. (2007) suggest that lower occupational groups are more likely to experience high stress, and managers are more likely to experience low stress—except for female managers. Likewise, Sherman et al. (2012)

found that, in comparison to non-leaders, leaders had lower levels of cortisol, indicating less stress. However, Judge et al. (1994) suggest that higher job levels are related to higher job stress. Moreover, in terms of distress (in particular, GHQ scores and anxiety), Welch et al. (1999) indicate that middle managers experience more than clerical workers, and clerical workers experience more than manual workers, but, perplexingly, senior managers experience less than middle managers.

Regardless of the type of leader mental health considered, these contradictory results suggest the need for additional research, not only into the direct relationships between mental health and leadership level but also into the mental health of leaders versus non-leaders. We need further studies investigating a broad range of positions, from subordinates to leaders as well as from lower-level leaders to higher-level ones. Do leaders have better or worse mental health than their employees? Do higher-level leaders have better or worse mental health than lower-level leaders? Does this pattern hold true for different types of mental health problems, such as burnout, stress, depression, anxiety, and general well-being? The current state of the literature cannot answer these questions.

Third, future research should investigate possible gender differences in leader mental health and the impact of gender discrimination. Björklund et al. (2013) and Kawaharada et al. (2007) indicate that female leaders have worse mental health than male leaders. Research has consistently found that women are less likely to emerge as leaders (Badura et al., 2018) and are subjected to stereotypes (Eagly et al., 2020), biases (Due Billing & Alvesson, 2000; Højgaard, 2002; Brescoll, 2011), and other barriers (Haile et al., 2016 Bismark et al., 2015; Badura et al., 2018), which might contribute to lower mental health for female leaders. Notably, gender discrimination has the potential to reduce the effectiveness of female leadership (Ayalew et al.,

2021) and presents an obstacle to women's leadership development (Sartore & Cunningham, 2007); yet gender discrimination and barriers for women's advancement were not examined in any of the studies reviewed and gender was rarely a focus.

Fourth, future work should explore both situational and personal factors to identify the main determinants of leader mental health. The current research shows large variation in situational and personal factors. Moreover, previous studies have also mixed personal and situational factors, typically without direct comparisons, such as workload and fear (Rogers et al., 1994), education and hiring control (Crank et al., 1995), or work-family conflict and organizational success (Judge et al., 1994). The only two studies that did directly compare situational and personal factors found contrasting results: Sharma (2007) suggests that stress personality, a personal factor, is the most important predictor of executive burnout; however, Dolan (1995) suggests that situational factors are the most significant predictors of burnout. These contrasting findings highlight the need for more research on the main determinants not only of burnout but also of general leader mental health. As researchers strive to alleviate the burden of mental ill-health through targeted interventions, a comprehensive understanding of the distinct effects of situational and personal factors is critical.

Fifth, one aspect of leader mental health that was not present in the studies examined was how leaders cope with mental ill-health. Different styles of coping, such as emotional and behavioural coping, are associated with transformational leadership (Atwater & Yammarino, 1993), and different types of leadership styles are related to different coping strategies (Alarcon et al., 2012), implying that leadership styles may play a role in how leaders cope. Additionally, as part of their role, leaders must also handle employee stress and engage in various coping strategies to deal with these increased demands (Skagert et al., 2008). However, much of the

research on coping relies heavily on job demands or stress and fails to examine leader coping within the scope of mental ill-health. Further, the scant research on leader coping focuses only on leaders, rather than examining coping strategies in both leaders and subordinates. Future research should examine coping within this broader context to answer questions about how leaders cope with their mental health in comparison to their employees. Do they access the same resources, and are they as effective?

Finally, this review has implications for theory. First, it suggests that models such as the job demand-control model and the effort-reward imbalance model omit the leader experience, which then leads to the dangerous assumption that all organizational members experience mental health in similar ways. Additionally, major leadership theories, such as transformational leadership, transactional leadership, and ethical leadership, do not include leader mental health as a core component. Hence, more theoretical work is needed to understand how the personal, situational, and behavioural factors of leadership influence leaders' mental health.

Conclusion

To date, research on mental health at work has mostly focused on employees, overlooking the leader experience. Yet, despite the assumption that leaders should have good mental health, leaders are not immune to mental health concerns. While the small amount of research that does exist has focused on leader substance abuse, the dark triad, and psychopathy, this systematic review suggests that leaders also experience burnout, stress, depression, anxiety, and mental distress due to a variety of personal and situational factors. Although this review was unable to conclusively determine whether leaders experience better or worse mental health than employees, it provides many opportunities for better and clearer research. The literature on leader mental health is still in its infancy and far more work is needed. It is my hope, therefore,

that this review and the accompanying recommendations for future research can serve as a starting point for a new stream of research aimed at understanding and improving leader mental health.

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Appendix B: Search strategies for all four databases

Database(s): **Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily** 1946 to March 06, 2019

#	Searches
1	Physician Executives/
2	exp Nurse Administrators/
3	exp Administrative Personnel/
4	exp Health Facility Administrators/ or exp Governing Board/
5	1 or 2 or 3 or 4
6	exp Occupational Stress/
7	exp Suicide/ or exp Suicide, Attempted/ or suicidal ideation/
8	exp Burnout, Psychological/
9	exp Mental Fatigue/
10	exp Anxiety/ or exp Anxiety Disorders/
11	exp Depression/
12	"Sleep Initiation and Maintenance Disorders"/
13	Mental Health/
14	6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15	5 and 14
16	((supervisor* or leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or administrator* or president or presidents or director or directors) adj8 ((job or occupation* or work* or psychological or perceived) adj2 stress*)).tw,kf.
17	((supervisor* or leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or administrator* or president or presidents or director or directors) adj8 (burnout or "burn-out" or "burn out" or ((emotion* or physical or psycholog*) adj3 exhaust*))).tw,kf.
18	((supervisor* or leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or administrator* or president or presidents or director or directors) adj8 ("mood disorder*" or depressi* or anxi* or suicid* or (job adj3 strain*) or (mental adj3 fatigue))).tw,kf.
19	((supervisor* or leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or administrator* or president or presidents or director or directors) adj8 ((sleep* adj3 (disorder* or disturb* or problem*)) or insomnia*)).tw,kf.
20	((supervisor* or leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or administrator* or president or presidents or director or directors) adj8 ((mental* adj3 (ill* or disorder* or wellbeing or "well-being")) or (psychiatric adj3 (ill* or disorder*)))).tw,kf.
21	((supervisor* or leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors) adj "mental* health").tw,kf.

22	((manager or managers) adj5 ((job or occupation* or work* or psychological or perceived) adj2 stress*)).tw.
23	((manager or managers) adj5 (burnout or "burn-out" or "burn out" or ((emotion* or physical or psycholog*) adj3 exhaust*))).tw.
24	((manager or managers) adj5 ("mood disorder*" or depress* or anxi* or suicid* or (job adj3 strain*) or (mental adj3 fatigue))).tw.
25	((manager or managers) adj5 ((mental* adj3 (ill* or disorder* or wellbeing or "well-being")) or (psychiatric adj3 (ill* or disorder*)))).tw.
26	((manager or managers) adj5 ((sleep* adj3 (disorder* or disturb* or problem*)) or insomnia*)).tw.
27	16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26
28	15 or 27
29	limit 28 to (comment or editorial or letter or patient education handout)
30	28 not 29

Database(s): PsycINFO 1806 to March Week 1 2019

#	Searches
1	exp TOP LEVEL MANAGERS/
2	exp MIDDLE LEVEL MANAGERS/
3	1 or 2
4	psychological stress/
5	exp Occupational Stress/
6	exp ATTEMPTED SUICIDE/ or exp SUICIDE/
7	exp Self-Injurious Behavior/ or exp Suicidal Ideation/
8	exp ANXIETY DISORDERS/ or exp ANXIETY/ or exp GENERALIZED ANXIETY DISORDER/
9	exp MAJOR DEPRESSION/ or exp RECURRENT DEPRESSION/ or exp "DEPRESSION (EMOTION)"/
10	exp INSOMNIA/ or exp Sleep Disorders/
11	mental health/
12	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11
13	3 and 12
14	((leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or president or presidents or director or directors) adj8 ((job or occupation* or work* or psychological or perceived) adj2 stress*)).tw,hw.
15	((leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or president or presidents or director or directors) adj8 (burnout or "burn-out" or "burn out" or ((emotion* or physical or psycholog*) adj3 exhaust*))).tw,hw.
16	((leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or president or presidents or director or directors) adj8 ("mood disorder*" or depress* or anxi* or suicid* or (job adj3 strain*) or (mental adj3 fatigue))).tw,hw.

17	((leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or president or presidents or director or directors) adj8 ((sleep* adj3 (disorder* or disturb* or problem*)) or insomnia*)).tw,hw.
18	((leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or president or presidents or director or directors) adj8 ((mental* adj3 (ill* or disorder* or wellbeing or "well-being")) or (psychiatric adj3 (ill* or disorder*)))).tw,hw.
19	((supervisor* or leader or leaders or ceo or executives or (chief adj3 officer*) or chairman or chairmen or administrator* or president or presidents or director or directors or manager or managers) adj "mental* health").tw.
20	((supervisor* or manager or managers or administrator*) adj5 ((job or occupation* or work* or psychological or perceived) adj2 stress*)).tw.
21	((supervisor* or manager or managers or administrator*) adj5 (burnout or "burn-out" or "burn out" or ((emotion* or physical or psycholog*) adj3 exhaust*))).tw.
22	((supervisor* or manager or managers or administrator*) adj5 ("mood disorder*" or depress* or anxi* or suicid* or (job adj3 strain*) or (mental adj3 fatigue))).tw.
23	((supervisor* or manager or managers or administrator*) adj5 ((mental* adj3 (ill* or disorder* or wellbeing or "well-being")) or (psychiatric adj3 (ill* or disorder*)))).tw.
24	((supervisor* or manager or managers or administrator*) adj5 ((sleep* adj3 (disorder* or disturb* or problem*)) or insomnia*)).tw.
25	14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24
26	13 or 25

Web of Science Core Collection

#	Search
1	TS=(((leader or leaders or ceo or executives or (chief NEAR/3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors or supervisor or supervisors) NEAR/3 ((job or occupation* or work* or psychological or perceived) NEAR/2 stress*)))
2	TS=(((leader or leaders or ceo or executives or (chief NEAR/3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors or supervisor or supervisors) NEAR/3 (burnout or "burn-out" or "burn out" or ((emotion* or physical or psycholog*) NEAR/3 exhaust*))))
3	TS=(((leader or leaders or ceo or executives or (chief NEAR/3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors or supervisor or supervisors) NEAR/3 ("mood disorder*" or depressed or depressi* or anxi* or suicid* or (job NEAR/3 strain*) or (mental NEAR/3 fatigue))))
4	TS=(((leader or leaders or ceo or executives or (chief NEAR/3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors or supervisor or supervisors) NEAR/3 ((sleep* NEAR/3 (disorder* or disturb* or problem*)) or insomnia*)))
5	TS=(((leader or leaders or ceo or executives or (chief NEAR/3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors or supervisor or supervisors) NEAR/3 ((mental* NEAR/3 (ill* or disorder* or wellbeing or "well-being")) or (psychiatric NEAR/3 (ill* or disorder*)))))
6	#1 OR #2 OR #3 OR #4 OR #5 Refined by: [excluding] DOCUMENT TYPES: (EDITORIAL MATERIAL OR NOTE OR MEETING ABSTRACT OR LETTER OR BIOGRAPHICAL ITEM OR BOOK REVIEW OR NEWS ITEM) Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI.

Business Source Complete (EBSCO)

#	Query

Limit	Limit to Academic journals only
S21	S13 OR S20
S20	S14 OR S15 OR S16 OR S17 OR S18 OR S19
S19	TI ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ((sleep* N3 (disorder* or disturb* or problem*)) or insomnia*)) OR AB ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ((sleep* N3 (disorder* or disturb* or problem*)) or insomnia*)) OR KW ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ((sleep* N3 (disorder* or disturb* or problem*)) or insomnia*))
S18	TI ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ("mood disorder*" or depressed or depressi* or anxi* or (mental N3 fatigue))) OR AB ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ("mood disorder*" or depressed or depressi* or anxi* or (mental N3 fatigue))) OR KW ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ("mood disorder*" or depressed or depressi* or anxi* or (mental N3 fatigue)))
S17	TI ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 (burnout or "burn-out" or "burn out" or suicid* or ((emotion* or physical or psycholog*) N3 exhaust*))) OR AB ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 (burnout or "burn-out" or "burn out" or suicid* or ((emotion* or physical or psycholog*) N3 exhaust*))) OR KW ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 (burnout or "burn-out" or "burn out" or suicid* or ((emotion* or physical or psycholog*) N3 exhaust*)))
S16	TI ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 (job N3 strain*)) OR AB ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 (job N3 strain*)) OR KW ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 (job N3 strain*))
S15	TI ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ((job or occupation* or work* or psychological or perceived) N2 stress*)) OR AB ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ((job or occupation* or work* or psychological or perceived) N2 stress*)) OR KW ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ((job or occupation* or work* or psychological or perceived) N2 stress*))

S14	TI ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ((mental* N3 (health or ill* or disorder* or wellbeing or "well-being")) or (psychiatric N3 (ill* or disorder*)))) OR AB ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ((mental* N3 (health or ill* or disorder* or wellbeing or "well-being")) or (psychiatric N3 (ill* or disorder*)))) OR KW ((supervisor* or leader or leaders or ceo or executive* or (chief N3 officer*) or chairman or chairmen or administrator* or president or presidents or manager or managers or director or directors)) N8 ((mental* N3 (health or ill* or disorder* or wellbeing or "well-being")) or (psychiatric N3 (ill* or disorder*))))
S13	S5 AND S12
S12	S6 OR S7 OR S8 OR S9 OR S10 OR S11
S11	DE "Insomnia -- Psychological aspects" OR DE "Sleep disorders -- Psychological aspects"
S10	DE "Anxiety disorders" OR DE "Mental depression" OR DE "Affective disorders" OR DE "Anxiety" OR DE "Mental health" OR DE "Well-being -- Psychological aspects"
S9	DE "Burnout (Psychology)" OR DE "Mental fatigue"
S8	DE "Suicidal behavior"
S7	DE "Suicide"
S6	DE "Job stress"
S5	S1 OR S2 OR S3 OR S4
S4	DE "ADVERTISING executives" OR DE "AGRICULTURAL administrators" OR DE "ARTS administrators" OR DE "ASIAN American executives" OR DE "ATHLETIC directors" OR DE "AUTOMOBILE industry executives" OR DE "CORPORATE presidents" OR DE "CORPORATE vice-presidents" OR DE "FINANCIAL executives" OR DE "GOVERNMENT executives" OR DE "HEALTH services administrators" OR DE "HUMAN resource directors" OR DE "INSURANCE executives" OR DE "INTERIM executives" OR DE "LIBRARY administrators" OR DE "LIQUOR industry executives" OR DE "MARKETING executives" OR DE "SALES executives" OR DE "SENIOR leadership teams" OR DE "SPORTS executives" OR DE "WOMEN executives" OR DE "CASINO managers" OR DE "CEMETERY managers" OR DE "CLUB managers" OR DE "DATA processing managers" OR DE "GOLF course managers" OR DE "HOTEL general managers" OR DE "LOGISTICS managers" OR DE "MIDDLE managers" OR DE "PRODUCT managers" OR DE "PROJECT managers" OR DE "PURCHASING managers" OR DE "REAL estate managers" OR DE "RISK managers" OR DE "SAFETY managers" OR DE "SECURITY managers"
S3	DE "CORPORATE directors" OR DE "BANK directors" OR DE "OUTSIDE directors of corporations" OR DE "WOMEN directors of corporations"
S2	DE "LEADERS" OR DE "SUPERVISORS" OR DE "INDUSTRIAL supervisors" OR DE "WOMEN supervisors"
S1	DE "EXECUTIVES" OR DE "CHAIRMAN of the board" OR DE "CHIEF compliance officers" OR DE "CHIEF data officers" OR DE "CHIEF executive officers" OR DE "CHIEF human capital officers" OR DE "CHIEF information officers" OR DE "CHIEF legal officers" OR DE "CHIEF marketing officers" OR DE "CHIEF operating officers" OR DE "CHIEF procurement officers" OR DE "CHIEF strategy officers" OR DE "CHIEF technical officers"

Chapter 4:

Planning, Performance, and Depression: An Experience Sampling Experiment

Organizations are looking for high-performing employees to contribute to their success. As organizations seek to increase their success, understanding the relationship among motivation, mental health, and performance is a key concern for organizational scholars. Moreover, there is a growing body of research indicating that depression is associated with absenteeism (Almond & Healey, 2003), presenteeism (Wang et al., 2010), job turnover (Lerner et al., 2004), and lost productivity (Lerner & Henke, 2008), suggesting that depression may be impacting employee performance. Many studies have examined the direct relationship between depression and decrements to performance (e.g., Adler et al., 2006; Ford et al., 2011; Lerner et al., 2010; Lerner & Henke, 2008; Wang et al., 2004), finding that depression is negatively associated with performance. In addition, the economic costs of depression in the workplace are estimated at $210 billion in the United States (Greenerg et al., 2015), $32 billion in Canada (Benjamin & Boyer, 2019), and €617 billion in Europe (Matrix, 2013). Finally, there is evidence of social stigmatization and discrimination of employees with depression (e.g., Brohan et al., 2011; Fox et al., 2016; Krupa et al., 2009; Manning & White, 1995; Stuart, 2004; 2006).

However, studies investigating the relationship between depression and work performance often are passive observational, focus on the between-person level of analysis where the focus is on comparisons of those with depression versus those without, and fail to consider mediating mechanisms or moderators (i.e., Harvey et al., 2011; Lerner et al., 2010, Wang et al., 2004). Therefore, to overcome previous limitations examining the relationship among motivation, depression, and performance, I first conduct a randomized control trial of a workplace planning intervention developed by integrating research from work motivation (Parke et al., 2018), and clinical psychology research on behavioural activation and depression

(Dimidjian et al., 2011). The motivation literature (Parke et al., 2018) has shown that planning can increase engagement and performance of employees. Moreover, clinical psychology research has shown that engaging in and following through on plans is an effective way to alleviate symptoms of depression (Coote & MacLeod, 2012). Therefore, integrating these two streams of research, I test two different planning interventions against a control condition. One planning intervention is time management planning, where employees identify the various activities they must complete in the day. The second planning intervention is contingent planning, where individuals not only plan their activities but also plan for how they will reengage with work after being interrupted throughout the day. Research has shown that under high interruptions this latter type of planning is more effective regarding engagement and performance (Parke et al., 2018).

Second, I examine the intervention using a daily experience sampling design over 15 days to examine daily change. Between-person research has dominated knowledge of work performance and mental health, with less attention paid to the daily experiences of employees, particularly within the context of interventions. Yet employees experience daily fluctuations in their emotions, attitudes, and behaviour, and even their mental health. Bono and colleagues (2013) collected employee data over 15 days and found that within-person variance accounted for 60% of the variance in mental health complaints. Within-person examinations allow us to take a more nuanced approach toward mental health, without assuming that constructs are stable. As I seek to understand how planning, depression, interruptions, and activation affect performance, this multi-level examination provides a more detailed and nuanced-view.

Third, I explore the mediating mechanism of behavioural activation, which underlies motivation (Strauman & Wilson, 2010), for the relationship between planning and performance. Behavioural activation promotes goal-directed behaviour, transforming motivational drives into

behavioural actions (Panksepp, 1998). In other words, activation is the mechanism through which goal planning leads to performance. It promotes the behaviours needed to achieve set goals, resulting in performance. With the experience sampling methodology, I am able to capture daily activation and performance scores, to investigate the mediating mechanism of activation.

Fourth, I investigate two possible moderators: depression and interruptions. With the current research design, I am able to examine both the between and within-person level moderating effect of depression on the relationship between planning and employee activation. Similarly, I also examine the moderating effect of interruptions on planning and activation to examine a possible boundary condition of planning.

Theoretical Background

Planning and Performance

Work performance is commonly defined as an individual's behaviour which contributes (or generates value) to their organization (Campbell et al., 1993). Campbell and Wiernik (2015) have suggested that various performance measures account for 20% of dependent variables studied in the fields of management and organizational behaviour. Yet despite the clear interest and extended inquiry into the topic, individual work performance remains underspecified (Carpini et al., 2017).

Researchers have proposed a multitude of frameworks to conceptualize job performance, both as a generic construct and as a job-specific construct. Although they have many similarities, generic frameworks use broader descriptions of job performance, whereas job-specific frameworks are targeted at specific professions, such as managers or army personnel. In the present study, I will be focusing on job performance as a generic construct.

Murphy and Kroeker (1988), and Campbell (1990) were among the first to propose a generic framework of individual work performance outlining major dimensions. Murphy and Kroeker (1988) proposed that work performance could be modeled using four sub-categories: task behaviours, interpersonal behaviours (communicating and cooperating with others), down-time behaviours (work-avoidance behaviours), and destructive/hazardous behaviours (behaviours that affect productivity losses, damage, or other setbacks). Campbell (1990), however, proposed eight sub-categories, merging generic and job-specific performance: job-specific task proficiency, non-job-specific task proficiency, written and oral communication, demonstrating effort, maintaining personal discipline, facilitating peer and team performance, supervision, and management and administration.

In their review of individual work performance, Carpini et al. (2017) mapped 996 unique performance terms (36 unique performance constructs) and suggest five clusters that describe work performance in organizational behaviour performance research. The first cluster, the management cluster, is the largest and most central cluster, focusing on the role of performance on key organizational outcomes. The second cluster, the personnel selection perspective cluster, is fundamentally concerned with measurement and predicting performance. The third cluster, the motivation cluster, focuses on the underlying motivational mechanisms in performance, often focusing on goal-setting theory. The fourth cluster, the good citizen cluster, focuses on organizational citizenship behaviour, broadening the boundaries of the definition of work performance. Finally, the fifth cluster, the job attitudes cluster, focuses on job satisfaction and other organizational attitudes. Using this conceptualization of work performance, I will be focusing on the third cluster, motivation, focusing on self-regulation. In line with previous research in this cluster, I will be focusing on how planning relates to activation and performance.

Research has suggested that workplace planning increases engagement and performance through increased self-regulation (Parke et al., 2018). Self-regulation is a conscious process based on directing oneself to one's goals, and gathering feedback about the process of goal attainment (Bandura, 1991). Setting goals, which involves defining the internal representations of desired states (Austin & Vancouver, 1996), provides the direction necessary for action and motivation. At the centre of self-regulation lies setting appropriate goals, taking actions to attain the goals, comparing progress against the goals, and making any modifications. This is performed through a feedback loop: individuals monitor feedback of thoughts, emotions, and behaviours, appraise the elements of a situation, and, when the goal remains to be completed, take appropriate action to reach the goal. If there is a discrepancy between the current state of an individual and their desired state, or goal, steps can be taken to reduce the discrepancy, moving closer toward the goal state (Vancouver, 2008). To reduce that discrepancy, planning can aid individuals through deciding when, where, and how to behave to reduce the discrepancy (Steel & Weinhardt, 2017).

Parke and colleagues (2018) examined two types of planning: time management planning (TMP) and contingency planning (CP) in an organizational setting to increase engagement and performance. In TMP, individuals specify, prioritize and schedule tasks, which become specific goals that individuals define for themselves; essentially, activity scheduling. The process of setting these tasks creates a goal-discrepancy, enhancing focus and concentration, and increasing goal progress. Further, Parke and colleagues suggest that TMP helps individuals monitor their accomplishments, as they keep track of their completed tasks, increasing engagement. Contingency planning (CP), on the other hand, is slightly different. Although individuals still plan their day by scheduling tasks, individuals also anticipate disruptions to their work, and plan

actions accordingly. Therefore, this type of planning is a meta-cognitive process where the individual anticipates problems and how to overcome them (Gollwitzer & Oettingen, 2011; Sun et al., 2014). In dynamic environments, where there are often uncontrollable events, TMP may not be sufficient as a planning strategy. As individuals plan and prioritize their day, they are over-optimistic that their day will not be interrupted; people often fail to consider the impact of disruptions during their day (Beuhler et al., 1994). However, when using contingent planning, individuals are forced to look at daily interruptions in their past to plan for the day, and more realistically determine the impact of disruptions.

The different ways to plan have in common an increased focus on goal completion: whether it is TMP, or CP, individuals who are planning their day more clearly also define their goals and more clearly focus and concentrate on achieving their set goals. Individuals who plan their work day develop a detailed map of their daily work, providing actionable steps to achieve their goals (Austin & Vancouver, 1996). They move from having intentions of behaviour, to drawing up a plan for behaviour through planning, to accomplishing their goals, thus increasing performance. As such, I hypothesize that planning will lead to higher levels of performance.

H1a: At the between-person level, the time management planning condition and the continent planning condition will lead to higher performance in comparison to the control condition.

H1b: At the within-person level, increased daily time management planning and increased daily contingent planning will lead to higher daily performance.

Activation

To explore a possible mediating mechanism for the relationship between planning and performance, I examine activation. Activation, also referred to as behavioural activation or the

facilitative motivational system (Elliot & Thrash, 2002), facilitates the transformation of an individual's abstract goals and motivational drives into observable behaviours (Panksepp, 1998).

Many researchers have conceptualized two distinct and independent systems for behavioural regulation and motivation (e.g., Elliot, 1999; Fowles, 1987; Gable et al., 2000; Gable & Gosnell, 2013; Gray, 1970, 1975, 1976, 1982, 1990; James, 1890; Spielberg et al., 2013). Most commonly, this distinction is referred to as the behavioural activation systems (BAS) vs. the behavioural inhibition system (BIS) (Gray 1970, 1975, 1976, 1982, 1990), or the approach vs. avoid systems (Elliot, 1999). For the present study, I focus on the behavioural activation system, which activates behaviour in response to external cues (Gray, 1990).

As individuals are confronted with their goals, they shift from intentions of behaviour to functional actions, activating their behaviour. By striving to achieve their goals, they increase their focused goal-directed activation and completion of planned activities: they are able to achieve their goals due to their focused goal-directed activation. By engaging in activities that help them achieve their specific goals (Kanter et al., 2006) this results in goal-related performance. Individuals who clearly set their goals by planning their activities for the day, are then able to achieve those goals (increasing performance) by activating their behaviour. Thus, activation acts as a mediator for the relationship between planning and performance.

H2a: At the between-person level, activation will mediate the relationship between both planning conditions (time management planning and contingent planning) and performance.

H2b: At the within-person level, activation will also mediate the relationship between planning and performance, such that increased daily planning (either time management

or contingent planning) will lead to increased daily activation, which will lead to increased daily performance.

Conceptualizing Depression

Although depression has been examined in the literature in a variety of ways, clinical psychologists typically examine depression in individuals with the DSM-V (American Psychiatric Association [APA], 2013) diagnosis of Major Depressive Disorder (MDD). MDD is a severe form of depression characterized by depressed mood most of the day, nearly every day, for at least two weeks. Individuals with MDD also lose interest in activities, have feelings of worthlessness and experience significant distress or impairment in social, occupational or other areas of functioning (APA, 2013). 79% of depressed workers state that their symptoms interfered with their ability to work (Gilmour & Patten, 2007). Depressed individuals are more likely to be unemployed, have greater absence rates at work, and show work performance deficits (Lerner & Henke, 2008), making depression at work a key concern.

Depression is often unobservable to people outside the individual. The feelings and thoughts that characterize depression cannot be observed; rather, the manifestations of those feelings are observable, thus complicating our measurement of the construct (Aneshensel, 2002). Regardless of the approach used to understand depression, it is worthwhile to note that any observations or even communication about thoughts and feelings by an individual are indication of an underlying, unobservable construct.

Since the 1960s, researchers have debated whether to assess mental illness categorically or dimensionally. The categorical distinctions made in the DSM-III in 1980 brought agreement among researchers regarding the adoption of the categorical approach for clinical diagnosis. Although atheoretical in its approach, the categorical approach made policies and litigation

easier to manage and explicate. Psychiatry more closely imitated the medical model in medicine, where healthy vs. sick became a clear and easily distinguishable line. Treatment became easier, and prevalence rates were able to be collected, giving rise to a greater understanding of the vast number of people struggling with mental illness. Although clinicians favour the categorical approach, alternative models have surfaced, bringing to light the complicated nature of depression.

Mirowsky and Ross (2002) strongly advocate for a dimensional indexed approach to depression. They suggest that we should be examining both the type and severity of an array of psychological problems, not only to increase statistical variance in our measures, but also to make meaningful associations. The arbitrary symptom cut-offs for depression ignore both the uniqueness of each case and commonalities among them, which impedes our understanding of depression. The difference between a diagnosis of depression and a non-diagnosis could come down to the difference of a single day, or a single symptom. The authors suggest that this categorization is inherently flawed, and thus not useful in our research. Ultimately, we are unprepared to help those suffering, as we end up obstructed by our dichotomies and unable to meaningfully and reliably study individuals with depression. Mirowsky and Ross propose that the dimensional indexed approach should be the social science approach to depression, and as such, I will be using a dimensional approach, focusing on occupational depression (Bianchi & Schonfeld, 2020).

Occupational depression is similar to burnout, but whether burnout is a distinct construct or simply a form of depression has been debated since the introduction of burnout into organizational research (Bianchi et al., 2015). Burnout and depression share many key characteristics: in particular, the emotional exhaustion component of burnout closely overlaps

with depression, and the constructs are highly correlated (Bianchi et al., 2015). Additionally, estimates of burnout can vary drastically (3.2% to 91.4%: Hewitt et al., 2020), based on how it is defined. Because of these similarities, debates have arisen in the literature: are burnout and depression two distinct constructs? Some researchers have suggested that burnout is job-specific, whereas depression is context-free (e.g., Maslach et al., 2001; Shirom, 2005). However, other researchers have disagreed with this view, suggesting that burnout does not differ from work-related depression, and thus should not be considered its own construct (e.g., Kahn, 2008). Schonfeld and colleagues (2019) even suggest that there are legal ramifications for having burnout in its own diagnostic category. As burnout is not covered in the DSM-V, employees are not protected in the same way they would be if they were diagnosed with depression. In their analysis, the authors question the discriminant validity of the burnout construct, further complicating and greying the areas between the two constructs. To assist in clarity, Bianchi and Schonfeld (2020) introduced the Occupational Depression Inventory (ODI) to measure work-attributed depressive symptoms. As I am investigated depression within the context of work, I focus specifically on occupational depression.

Self-Regulation and Depression

Some researchers have categorized depression as a systemic disorder manifested through failed self-regulation, where depression is driven by the failure of an individual's psychological capacity to pursue goals (Strauman, 2002, 2017, 2021). Strauman (2017, 2021) suggests that not only does the failure to self-regulate trigger the initial depressive episode, but it also perpetuates the condition as the self-regulatory pathways become altered. Individuals with depression feel a loss of motivation and may lack the capacity to respond effectively to cues for reward. In his review, Strauman proposes that the pattern of breakdown and dysregulation causes a

hypoactivation of promotion goals, leading to depressed mood, anhedonia, hopelessness, and fatigue. Strauman argues that when the dysregulation becomes irreversibly altered, the risk of future depressive episodes increases, which makes treatment more difficult.

Moreover, managing depression necessitates individuals to self-regulate: to be successful, individuals must be able to recognize, appraise, control and monitor their depressive symptoms (Care & Kuiper, 2013). Depressed individuals are seen as active managers of their depression, rather than passive individuals. Hagerty and colleagues (2018) suggest that the self-recognition and appraisal of behaviours, thoughts and emotional patterns can be critical when assessing indicators of emerging depression. Individuals with recurrent depression often experience a specific phase before the onset of acute depression, known as the prodromal stage, characterized by anxiety, irritable mood, anhedonia, and sleep disorders (Fava & Tossani, 2007). Yet Hagerty and colleagues (1997) suggest that most individuals cannot identify this phase for themselves. Hagerty and colleagues (2018) developed a Self-Regulatory Illness Management of Depression (SRIM-D) model, where they present self-regulation as the mechanism for management of depression. They propose that person, illness history, provider, and social environment influence an individual's self-regulation process, which reciprocally influences self-management outcomes of healthcare utilization, illness symptoms, and functioning.

The extent to which individuals are able to behaviourally activate is related to increased psychopathology, including depression (Alloy et al., 2008; McFarland et al., 2006; Pickering & Gray, 1999). As depression affects an individual's ability to self-regulate, they are unable to achieve tasks, lowering their activation and performance. Eddington and colleagues (2008) suggest that depression leads to an attenuated motivational response to goals: in response to goal

priming, depressed individuals experience hypoactivation. In essence, they experience reduced activation, even in response to the same goal priming as non-depressed individuals.

Further, clinical researchers have examined this relationship and its connection to the neurotransmitter dopamine. Dopamine plays a key role in our behaviour, cognition, and emotion systems (Grace, 2016), and a dopamine deficiency has been linked to depression (Dunlop & Nemeroff, 2007; Grace, 2016). A dysfunction in dopamine can affect self-regulation systems based on cognition, which are critical for activation and work performance.

This suggests that depressed individuals lack the psychological capacity to appropriately monitor their goals and are unable to monitor and respond to the feedback on goal progress, resulting in lowered activation and performance deficits. Further, even if an individual does plan their day, depression will limit the effectiveness of that planning. The failure to self-regulate suggests that although the daily goals are clearly laid out, individuals struggling with depression will lack the motivation and regulation to complete these goals, inhibiting their activation.

H3a: At the between-level, occupational depression will moderate the relationship between planning and activation, such that individuals who experience more depressive symptoms will have lowered levels of activation, even if they time management plan or contingent plan than those with fewer depressive symptoms.

H3b: At the within-person level, occupational depression will moderate the relationship between daily planning and activation, such that an individual who experiences more depressive symptoms on that day will also experience lower daily activation, even if they time management plan or contingent plan that day than days when the individual has fewer depressive symptoms.

The Moderating Effect of Interruptions

Workplaces are complex and dynamic environments, where work interruptions, "unexpected suspension[s] of the behavioural performance of, and/or attentional focus from, an ongoing work task" (p. 817), are the norm (Puranik et al., 2020). As employees focus on their daily tasks, they are often interrupted by colleagues, supervisors, and subordinates. These interruptions include colleagues stopping by to request help or information, or to provide updates or information, assigning tasks to subordinates, and socializing with colleagues (Parke et al., 2018; Wajcman & Rose, 2011). Although these interruptions can be beneficial for the organization, they impede work progress by distracting employees from their task at hand. They suspend attentional focus from the task, diverting it to the interrupting task. Interruptions inhibit goal progress and add to the employee's workload, as the employee is forced to shift their attention among numerous tasks. This results in delays in task resumption and performance errors as the employee struggles to get back to the task at hand (Puranik et al., 2020). Even if an individual is able to plan their work day, a high level of interruptions will offset that plan. Time management planning does not account for interruptions; employees plan their tasks for the day taking into account their goals. Interruptions are, by definition, unexpected, and thus are not planned for when time management planning. Employees who schedule their day are not prepared for these interruptions, and they will not be able to shift from intentions of behaviour to functional actions. As such, individuals who experience high levels of interruptions will not be activated. They will be unable to complete tasks according to their plan, resulting in lowered goal progress and lowered activation.

H4a: At the between-person level, interruptions will moderate the relationship between TMP and activation, such that under high interruptions, activation will be lower.

H4b: At the within-person level, daily interruptions will moderate the relationship between daily TMP planning and activation, such that even if an individual plans on a given day, when that individual experiences high interruptions, their daily activation will be lowered.

However, when an individual specifically plans for interruptions and plans how to recover from interruptions, this should mitigate the effects of interruptions. Individuals who contingent plan will see interruptions as part of their work (Parke et al., 2018). They will have planned how to recover from interruptions and how to switch attention back to the focal task at hand, resulting in greater shifts from intentions of behaviour to functional actions. As such, interruptions should moderate the relationship between contingent planning and activation, resulting in higher levels of activation under high interruptions when contingent planning.

H5a: At the between-person level, interruptions will moderate the relationship between contingent planning and activation, such that under high interruptions, activation will be higher.

H5b: At the within-person level, daily interruptions will moderate the relationship between daily contingent planning and activation, such that even if an individual plans on a given day, when that individual experiences high interruptions, their daily activation will be higher.

Methods

To test these hypotheses (see Figure 4 for model and Table 9 for overview) at both the between-person and within-person levels, I use an experience sampling methodology combined with an experimental manipulation of planning.

Figure 4

Multilevel Hypothesized Study Model

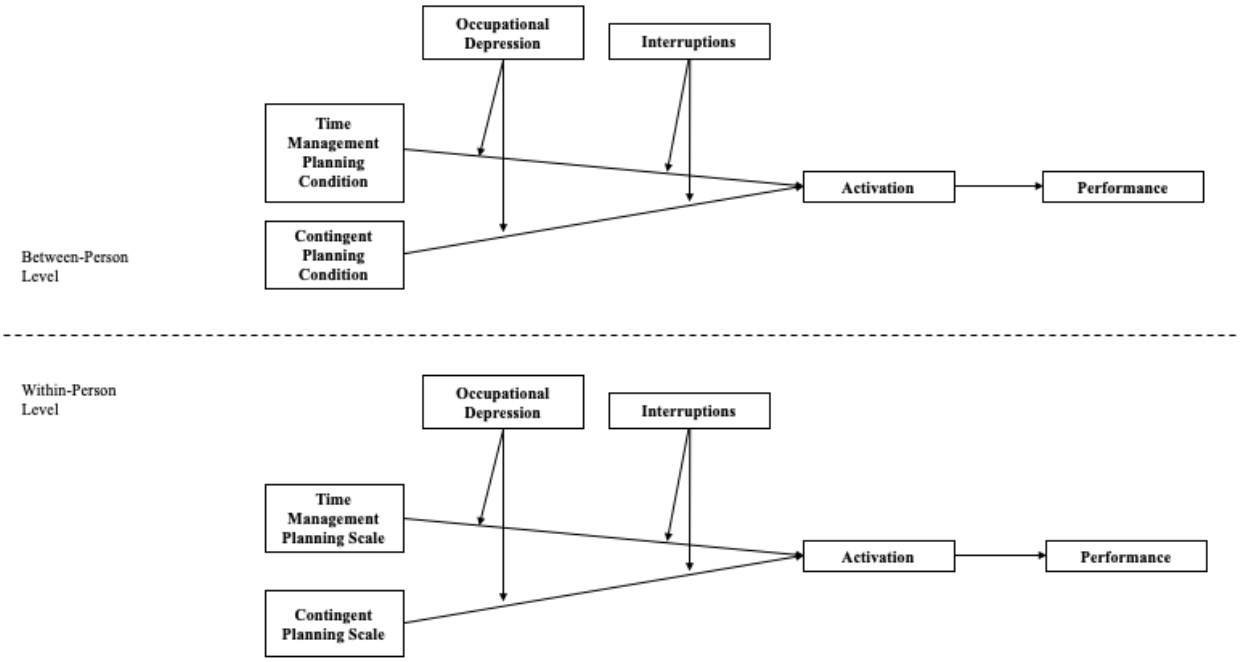


Table 9

Summary of Hypotheses at Both Levels of Analysis

Between-Person level	Results	Within-Person level	Results
H1a: At the between-person level, the time management planning condition and the continent planning condition will lead to higher performance in comparison to the control condition.	Unconditional effect: not supported Neither TMP nor CP related to performance	*H1b: At the within-person level, increased daily time management planning and increased daily contingent planning will lead to higher daily performance.*	Unconditional effect: partially supported TMP related to performance, but not CP
H2a: At the between-person level, activation will mediate the relationship between both planning conditions (time management planning and contingent planning) and performance.	Unconditional effect: not supported Neither TMP nor CP related to activation, but Act related to performance	*H2b: At the within-person level, activation will also mediate the relationship between planning and performance, such that increased daily planning (either time management or contingent planning) will lead to increased daily activation, which will lead to increased daily performance.*	Unconditional effect: partially supported Only TMP (not CP) related to activation, and activation related to performance
H3a: At the between-level, occupational depression will	Conditional effect: fully supported	*H3b: At the within-person level, occupational depression*	Conditional effect: fully supported

moderate the relationship between planning and activation, such that individuals who experience more depressive symptoms will have lowered levels of activation, even if they time management plan or contingent plan.	Significant interaction for both TMP and CP	*will moderate the relationship between daily planning and activation, such that an individual who experiences more depressive symptoms will also experience lower daily activation, even if they time management plan or contingent plan that day.*	Significant interaction for both TMP and CP
H4a: At the between-person level, interruptions will moderate the relationship between TMP and activation, such that under high interruptions, activation will be lower. .	Conditional effect: not supported Non-significant interaction for TMP	*H4b: At the within-person level, daily interruptions will moderate the relationship between daily TMP planning and activation, such that even if an individual plans on a given day, when that individual experiences high interruptions, their daily activation will be lowered*	Conditional effect: supported Significant interaction for TMP
H5a: At the between-person level, interruptions will moderate the relationship between contingent planning and activation, such that under high interruptions, activation will be higher.	Conditional effect: not supported Non-significant interaction for CP	*H5b: At the within-person level, daily interruptions will moderate the relationship between daily contingent planning and activation, such that even if an individual plans on a given day, when that individual experiences high interruptions, their daily activation will be higher.*	Conditional effect: not supported Non-significant interaction for CP

Experience Sampling Procedure

I used an experience sampling methodology to have participants plan their day every day. This methodology also gave me the opportunity to measure planning, interruptions, activation, and performance on a daily basis. After consenting to participate, participants were emailed every morning and evening over 15 days with a link to participate in the survey. Participants received $1 for each completed survey, and a $5 bonus if they completed all 30 surveys (i.e., morning and evening for 15 days). The morning survey consisted of the planning manipulation, and the evening survey contained measures of interruptions, activation, daily job demands and

work fatigue. Every Monday and Friday, participants were also asked to report their depressive symptoms in the evening survey.

Manipulation

To test the between-person effects of planning, I designed a planning intervention. This experimental manipulation allowed for a randomized controlled trial of planning on activation and performance. Participants were randomly assigned to one of three conditions: time management planning, contingent planning, or a control group.

Time Management Planning

Participants in the time management planning condition were told that "The process of specifying, prioritizing, and scheduling tasks can be incredibly beneficial for enhancing focus and concentration." They were then asked to list five work-related tasks/activities they must accomplish today. Participants were then instructed to list when they would complete each task today, taking into account approximately how long it would take to complete.

Contingent Planning

In addition to time management planning, participants in the contingent planning condition were also told, "You might experience some interruptions today which have the potential to derail your work." They were asked to describe ways in which they might be interrupted today, and were asked to plan how they would adjust their task plan to take into account possible interruptions. They were also instructed to plan how they would recover from interruptions and get back to the task at hand.

Examples of anticipated interruptions from participants included, "phone calls about selling my car," "unexpected phone calls with request for immediate information," "daughter's school might call me," "children needing to use the bathroom," "taking care of customer issues,"

"technical/internet issues," "walk-in patients," "unexpected emails," "unscheduled visitors," "foster kittens…could demand my attention," or "new tasks."

To deal with these interruptions, participants were going to "push things back into tomorrow," "adjust everything else [but main meeting] to the time it takes to do it or will move it forward or back," "tell them I'm busy," "just keep working and ignore her," "be flexible on schedule," "padded my tasks with extra time to make up for interruptions," "direct to someone else," or "task prioritization and delegation."

To recover and get back to the task at hand, participants "will build time for [interruptions] during my day," "keep tabs open or sticky notes if there was something specific I was in the process of working on," "take a short break, then refocus on the next job," "leave the apartment if necessary," "rely on my team to cover for me if I am detained," "review my schedule and remind myself to focus on the most important tasks" or "set a timer on my phone."

Control Group

Participants in the control condition were asked to take a moment, notice their surroundings, and describe it. They subsequently were asked about the room (i.e., how organized, noisy, well-lit their work environment is). Participants also recorded which one word they would use to describe their work space. Examples include: comfortable, organized, peaceful, cozy, quiet, simple, and busy.

Sample

The sample comprised of 300 North American employees working full time (36+ hours a week). I used Amazon Mechanical Turk and Cloud Research to collect the sample. I removed participants who completed fewer than three time points, or who did not write anything for their condition prompts. The final sample consisted of 282 participants (166 male, 116 female).

Participants' mean age was 38.86 (*SD* = 9.90). On average, 1.93 adults lived in their households, with 23.8% of participants living by themselves and 62.4% living with one other person. 44.0% had at least one child living in the household, and the average was .74 children. 75.5% were White or Caucasian, 9.6% were Asian or Pacific Islander, 6.7% were Black or African American, 3.9% were Hispanic or Latino, and 3.5% were multiracial or biracial. Employees worked in a wide range of fields, with the most common being education (9.6%), manufacturing (8.5%), banking/finance/insurance (8.5%), healthcare (7.4%), and government/public administration (7.4%). Regarding job roles, 20.9% were trained professionals, 19.5% were middle management, 16.7% were junior management, 13.8% were administrative staff, and 11.3% were support staff (see Table 10 for full participant information).

Table 10

Participant Demographics

Participant Demographics	Percentage of total sample
Adults living in household	
1	23.8
2	62.4
3	6.7
4	4.3
5+	2.8
Children living in household	
0	56.0
1	21.3
2	14.9
3	3.5
4+	4.3
Race/ethnicity	
Asian/Pacific Islander	9.6
Black or African American	6.7
Hispanic or Latino	3.9
White or Caucasian	75.5
Multiracial or Biracial	3.5

Did not specify	0.7
Industry	
Accounting	1.4
Advertising	1.1
Aerospace/Aviation/Automotive	0.4
Agriculture/Forestry/Fishing	0.7
Banking/Finance/Insurance	8.5
Business Services	2.8
Construction	3.2
Mining	0.4
Manufacturing	8.5
Healthcare	7.4
Hotel and Food Services	3.2
Government/Public Administration	7.4
Legal Services	1.8
Education	9.6
Arts/Entertainment	2.8
Information Services and Data Processing	4.3
Real Estate	1.8
Transportation	3.2
Retail	6.4
Utilities	0.4
Computer Services	6.4
Publishing	0.7
Telecommunications	2.5
Scientific or Technical	5.7
Other	9.4
Role in industry	
Upper management	2.8
Middle management	19.5
Junior management	16.7
Administrative staff	13.8
Support staff	11.3
Trained professional	20.9
Skilled labourer	5.7
Consultant	2.1
Temporary employee	0.4
Researcher	1.1
Self-employed/partner	3.5
Other	2.2

Measures

Focal Measures

Time Management Planning Scale. Time management planning was assessed with the Time Management Planning scale (TMP: Parke et al., 2018). Items included, "I determined the tasks I wanted to accomplish today," "I made a schedule of the activities I had to do today," and "I set timelines for each of the tasks I had to accomplish today." The average Cronbach's alpha across the 15 days was .83.

Contingent Planning Scale. Contingent planning was assessed with the Contingent Planning Scale (CP: Parker et al., 2018). Items included, "I thought through possible interruptions or disruptions to my tasks today and planned for them," "I developed alternative courses of action in case my tasks were interrupted or disrupted today," and "I planned for possible disturbances or interruptions to my work today." The average Cronbach's alpha across the 15 days was .95.

Interruptions. Interruptions at work were assessed using Parke et al.'s (2018) five-item measure, which I altered to specify work interruptions. This included items such as "I was interrupted by people at work seeking information from me," "I was interrupted by people at work seeking my help," and "I was interrupted by people at work for non-work-related matters (e.g., socializing)." The average Cronbach's alpha across the 15 days was .86.

Occupational Depression. Occupational depression was assessed using the 9-item Occupational Depression Inventory (ODI: Bianchi & Schonfeld, 2020). Participants filled out the ODI five times, on days 1, 5, 8, 12, and 15 (every Monday and Friday). I changed the time period from two weeks to one week, so participants were asked, "The following statements concern the impact your work could have had on you. Please read each statement and indicate

how often you experienced the problems mentioned over the past week." Items include, "My work was so stressful that I could not enjoy the things that I usually like doing," "I felt depressed because of my job," and "My experience at work made me feel like a failure." The average Cronbach's alpha across the five days was .93.

Activation. Activation was assessed using the activation factor of BADS-SF (Manos et al., 2011), with the question stem altered to refer to *today.* This five-item scale included items such as, "There were certain things I needed to do that I didn't today" (reverse-scored), "I made good decisions about what type of activities and/or situations I put myself in today," and "I am content with the amount and types of things I did today." The average Cronbach's alpha was .72.

Performance. Performance was measured with the four items from the role performance scale (Williams & Anderson, 1991). Items included, "I fulfilled all the responsibilities specified in my job description," "I consistently met the formal performance requirements of my job," "I conscientiously performed tasks that were expected of me," and "I adequately completed all of my assigned duties." Average Cronbach's alpha was .96.

Control Variables

Daily Job Demands. Daily job demands were assessed with a 4-item scale adapted from Breevaart and Bakker (2018), and Butler et al. (2005). Items included, "Today, my work required a high level of concentration," "Today, I had to work very hard," "Today, my job was very hectic," and "Today, I was asked to do too much work."

Engagement. Engagement was measured with the three-item Ultra-Short Workplace Engagement Scale (Schaufeli et al., 2017). Items included, "At work, I feel bursting with energy," "I am enthusiastic about my work," and "I am immersed in my work."

Results

Measurement Model

I tested my hypotheses using a multilevel model in Mplus (Muthén & Muthén, 2017), but first began by testing my measurement model using multilevel confirmatory factor analysis to examine the factor structure of the within and between-person levels. I created parcels for occupational depression, interruptions, and activation, as parceling results in more reliable latent estimates (Little et al., 2002). I used random distribution to create three parcels per construct. The other measures were relatively short, and thus did not necessitate parceling. The hypothesized six-factor model (time management planning scale, contingent planning scale, occupational depression, activation, interruptions, and performance) demonstrated acceptable fit with the data, $\chi^2(274) = 998.41$, $p < .001$, Comparative Fit Index (CFI) = .95, Tucker-Lewis Index (TLI) = .94, Root Mean Square Error of Approximation (RMSEA) = .03, Standardized Root Mean Square Residual $(SRMR)_{within} = .05$, and $SRMR_{between} = .09$. I compared this to an alternate five-factor model which combined performance and activation into one factor, which showed worse fit to the data: $\chi^2(250) = 1452.71$, $p < .001$, CFI = .89, TLI = .87, RMSEA = .04, $SRMR_{within} = .06$, and $SRMR_{between} = .12$. I also tested an alternate four-factor model which combined the two moderators, occupational depression and interruptions, which again showed worse fit to the data: $\chi^2(258) = 2183.16$, $p < .001$, CFI = .83, TLI = .80, RMSEA = .05, $SRMR_{within} = .09$, and $SRMR_{between} = .14$.

Hypothesis Testing

Table 11 presents descriptive statistics, ICC(1) values and inter-correlations among variables. ICC(1) values ranged from .43 to .83, indicating substantial within-person variance (17% – 57% within-person variance), suggesting that it is appropriate to examine within-person

relationships. The hypothesized model showed excellent fit: $\chi^2(24) = 37.62$, $p = .04$, CFI = .99, TLI = .96, RMSEA = .02, $SRMR_{within} = .01$, and $SRMR_{between} = .01$.

Table 11

Means, Standard Deviations, ICC(1) Values, and Correlations Among Variables

Variable	*M*	*SD*	ICC(1)	1	2	3	4	5	6	7	8
1. TMP scale	3.33	.99	.66	-	.16***	.00	.08***	.10***	-.01	.03**	.10***
2. Contingent planning scale	2.69	1.21	.71	.57***	-	.00	.06***	.07***	.02**	.07***	.11***
3. Occupational depression	1.42	.55	.83	-.07**	.01	-	-.01	-.00	.02***	.01	-.01**
4. Activation	3.59	.73	.62	.25***	.17***	-.15***	-	.12***	.00	.04***	.13***
5. Performance	4.11	.79	.61	.22***	.15***	-.11***	.27***	-	.02**	.09***	.19***
6. Interruptions	2.14	.76	.54	-.04	.07	.12***	-.08***	-.08**	-	.15***	.03***
7. Daily job demands	3.11	.98	.43	.10**	.16***	.09***	.04	.11***	.12***	-	.17***
8. Engagement	4.24	1.43	.71	.51***	.41***	-.22***	.47***	.41***	-.08	.23***	-

Note. TMP = Time Management Planning. Level-1 (within-person) correlations are reported above the diagonal ($n = 2963$); Level-2 (between-person) correlations are reported below the diagonal ($n = 282$). ICC(1) represents the proportion of between-person variance. * $p < .05$, ** $p < .01$, *** $p < .001$.

Between-Person Hypotheses

Hypothesis 1a stated that planning will lead to increased performance. In comparison to the control, neither the time management planning condition ($\gamma_{01} = -.05$, $SE = .07$, $p = .47$) nor the contingent planning condition ($\gamma_{01} = -.09$, $SE = .08$, $p = .25$) was significantly related to performance (see Table 12). Thus, Hypothesis 1a was not supported.

Hypothesis 2a proposed that activation mediates the relationship between planning and performance, such that planning leads to activation, and activation leads to performance. In comparison to the control condition, neither the time management condition ($\gamma_{01} = .06$, $SE = .06$, $p = .39$) nor the contingent planning condition ($\gamma_{01} = -.01$, $SE = .07$, $p = .83$) were related to

activation. However, activation was positively related to performance (γ_{01} = .90, *SE* = .09, $p <$ .001). Thus, Hypothesis 2a was not supported.

Table 12

Results of Multilevel Modeling for Unconditional Between-Person Effects (TMP and Contingent Planning Conditions vs. Control Condition)

	Activation		Performance	
Predictor Variable	Estimate	*SE*	Estimate	*SE*
Daily job demands	.03	.05	.30***	.06
Engagement	.20***	.03	-.09*	.04
TMP vs. control	.06	.06	-.05	.07
Contingent planning vs. control	-.01	.07	-.09	.07
Occupational depression	-.32***	.07	-.02	.09
Interruptions	-.05	.06	-.12	.07
Activation			.90***	.09
Level 2 residual variance	.14***	.02	.17***	.02

Note. TMP = Time Management Planning. Unstandardized estimates provided (*n* = 256)

Table 13

Results of Multilevel Modeling for Conditional Between-Person Effects (TMP and Contingent Planning Conditions vs. Control Condition)

	Activation		Performance	
Predictor Variable	Estimate	*SE*	Estimate	*SE*
Daily job demands	.00	.06	.29***	.07
Engagement	.21***	.03	-.01*	.04
TMP vs. control	.61*	.30	-.05	.07
Contingent planning (CP) vs. control	.70**	.26	-.08	.08

Occupational depression	-.65**	.22	.38	.27
Interruptions	-.28	.28	.23	.33
TMP*Occupational depression	-.40**	.15		
CP*Occupational depression	-.40**	.15		
TMP*Interruptions	.01	.16		
CP*Interruptions	-.07	.13		
Activation			.95***	.09
Level 2 residual variance	.12***	.02	.15***	.02

Note. TMP = Time Management Planning

Hypothesis 3a stated occupational depression will moderate the relationship between planning and activation. At the between-person level (see Table 13), occupational depression significantly interacted with the time management planning condition (γ_{01} = -.40, *SE* = .15, *p* = .008) and with the contingent planning condition (γ_{01} = -.40, *SE* = .15, *p* = .009), in comparison to the control condition, to predict activation. Thus, Hypothesis 3a was supported. Figures 5 and 6 illustrate this effect. As both figures show, those who experience high occupational depression were less activated, once again provided support that depressed individuals struggle with hypoactivation. People with low levels of occupational depression were more activated, regardless of whether they were in the time management planning condition or the contingent planning condition. Both the time management and contingent planning conditions slightly increased activation for those with low levels of depression, but did little for those struggling with higher levels of occupational depression.

Figure 5

Between-Person Two-Way Interaction Between TMP Condition and Occupational Depression on Activation

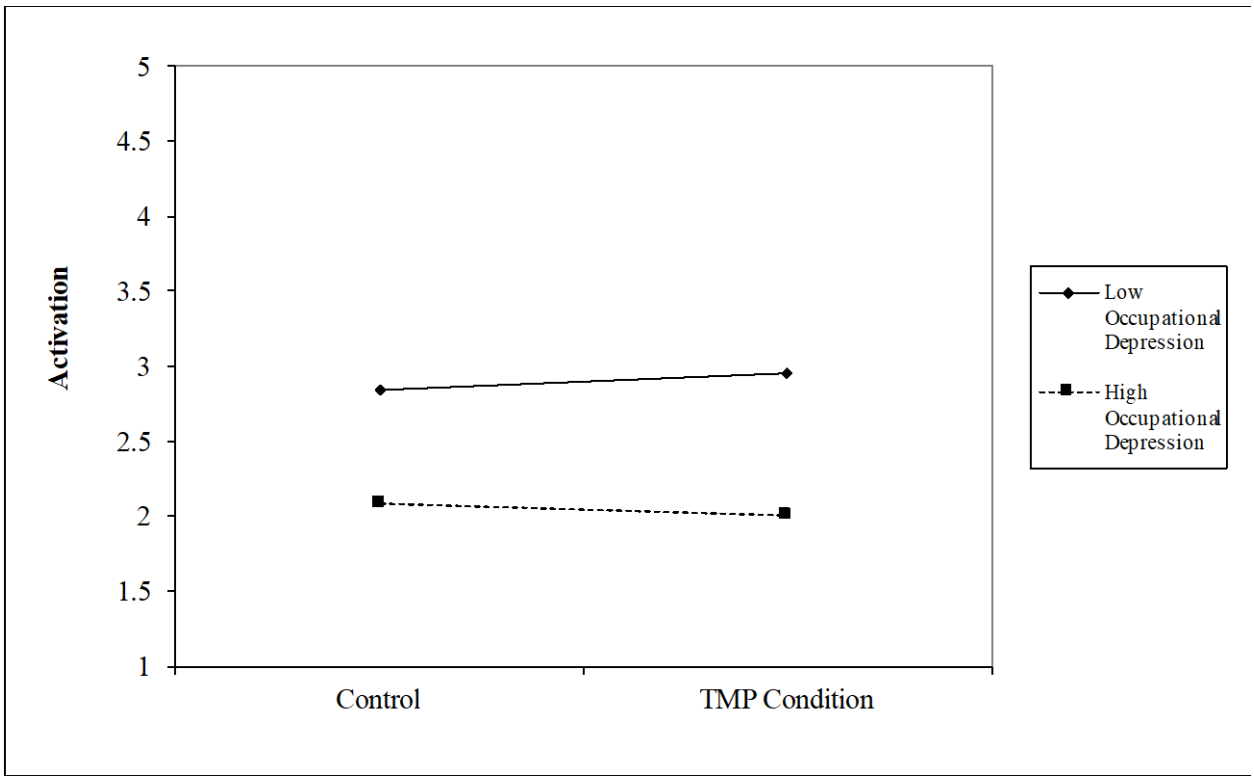
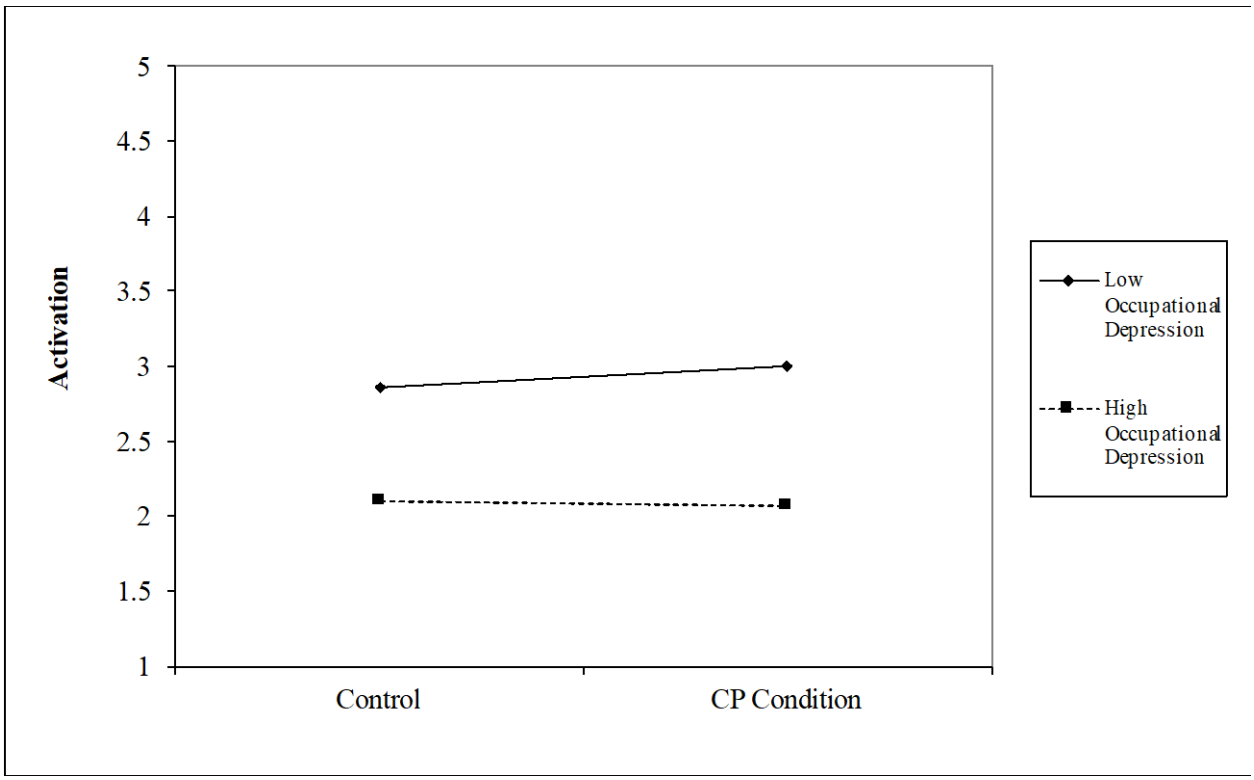


Figure 6

Between-Person Two-Way Interaction Between CP Condition and Occupational Depression on Activation



Hypothesis 4a stated that interruptions will moderate the relationship between TMP and activation, and Hypothesis 5a stated that interruptions will moderate the relationship between contingent planning and activation. In comparison to the control, interruptions neither moderated the time management planning condition (γ_{01} = .01, *SE* = .16, *p* = .96) nor the contingent planning condition (γ_{01} = -.07, *SE* = .13, *p* = .55). Thus, Hypotheses 4a and 5a were not supported.

Within-Person Hypotheses

Hypothesis 1b stated that planning will lead to increased performance. The results suggest (see Table 14) that at the within-person level, daily time management planning was significantly positively related to daily performance (γ_{10} = .11, *SE* = .03, $p < .001$), but daily contingent planning was not (γ_{10} = .03, *SE* = .02, $p = .23$). Thus, Hypothesis 1b was only partially supported.

Hypothesis 2b proposed that activation mediates the relationship between planning and performance, such that planning leads to activation, and activation leads to performance. At the within-person level, daily time management planning was related to daily activation (γ_{10} = .21, *SE* = .02, $p < .001$), however daily contingent planning was not related to daily activation (γ_{10} = .02, *SE* = .02, $p = .30$). Daily activation was significantly related to daily performance (γ_{10} = .48, *SE* = .04, $p < .001$), suggesting a mediation effect for daily time management planning but not daily contingent planning, thus only partially supporting Hypothesis 2b.

Table 14

Results of Multilevel Modeling for Unconditional Daily-Level (Within-Person) Effects

	Activation		Performance	
Predictor Variable	Estimate	*SE*	Estimate	*SE*
Daily job demands	.03	.02	.04	.02
Engagement	.18***	.02	.13***	.02
TMP	.21***	.02	.11**	.02
Contingent planning	.02	.02	.03	.02
Occupational depression	-.04	.05	.01	.06
Interruptions	-.02	.03	.03	.03
Activation			.48***	.04
Level 1 residual variance	.15***	.01	.23***	.01

Note. TMP = Time Management Planning. Unstandardized estimates provided (*n* = 256)

Hypothesis 3b stated occupational depression will moderate the relationship between planning and activation. At the within-person level (see Table 15), occupational depression significantly interacted with daily time management planning (γ_{10} = -.09, *SE* = .04, *p* =.009) and daily contingent planning (γ_{10} = .09, *SE* = .03, *p* = .01) to predict daily activation. Figures 7 and 8 illustrate this effect.

Table 15

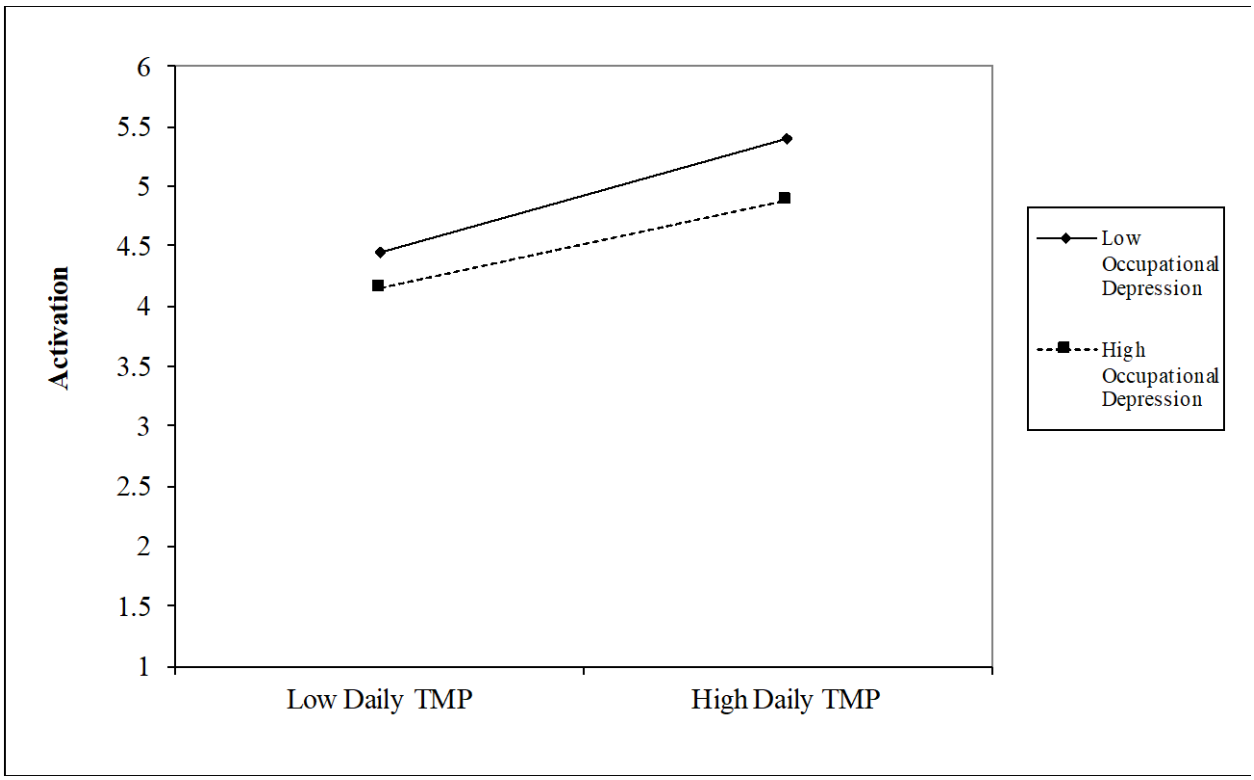
Results of Multilevel Modeling for Conditional Daily-Level (Within-Person) Effects

	Activation		Performance	
Predictor Variable	Estimate	*SE*	Estimate	*SE*
Daily job demands	.03	.02	.04	.02
Engagement	.18***	.02	.13***	.02
TMP	.56***	.06	.11**	.03
Contingent planning (CP)	-.16**	.05	.02	.02
Occupational depression	-.06	.12	-.03	.05
Interruptions	.23**	.08	.02	.03
TMP*Occupational depression	-.09**	.04		
CP*Occupational depression	.09**	.03		
TMP*Interruptions	-.10***	.03		
CP*Interruptions	.03	.02		
Activation			.48***	.04
Level 1 residual variance	.15***	.01	.23***	.01

Note: TMP = Time Management Planning.

Figure 7

Within-Person Two-Way Interaction Results Between Daily TMP and Occupational Depression on Activation

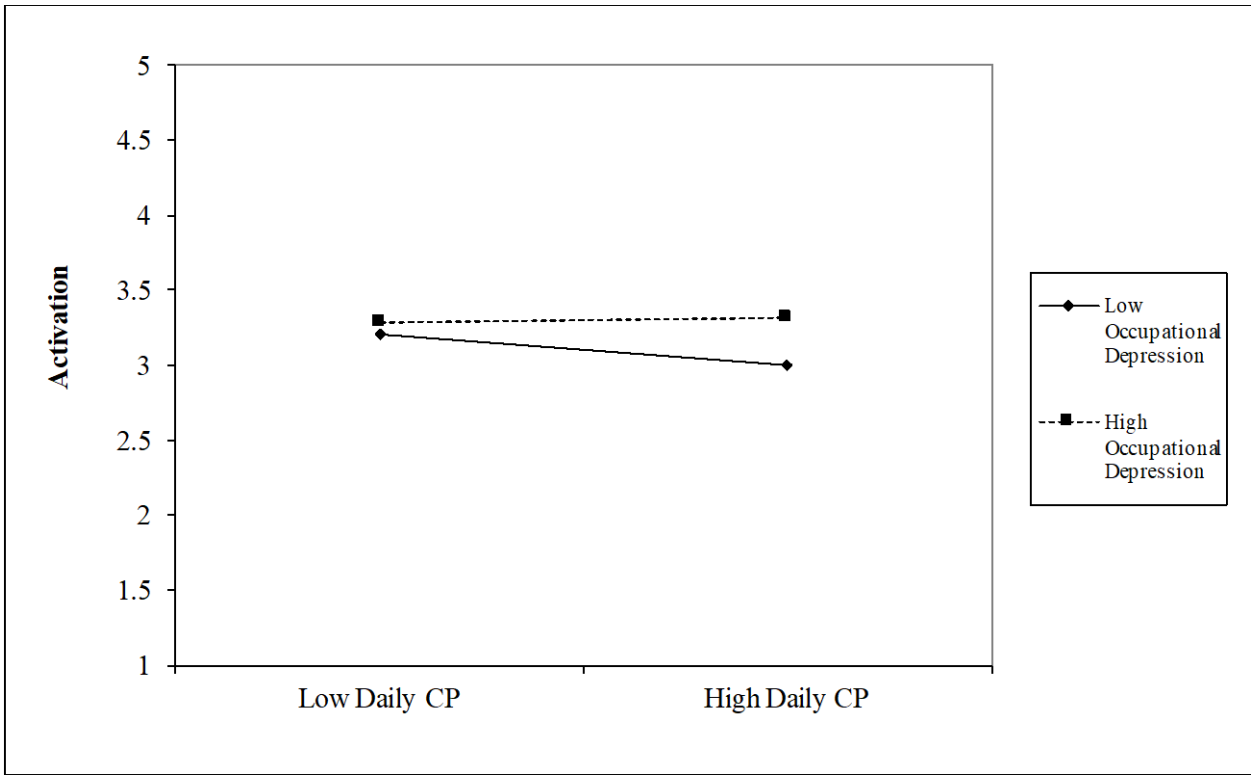


As can be seen in Figure 7, those with low levels of occupational depression had higher levels of activation than those with higher levels of occupational depression: depression seems to be limiting an individual's ability to be activated. In particular, an individual who experiences a low level of depression, and thus better mental health, is more activated than when that individual experiences a higher level of depressive symptoms. TMP seems to matter for activation: an individual who schedule their activities is more likely to be activated that day, but this effect is particularly important for those experiencing high levels of occupational depression – it brings them to the same level of activation as when the individual is not experiencing

occupational depression. TMP appears to help counter the hypoactivation prevalent in those struggling with depression.

Figure 8

Within-Person Two-Way Interaction Between Daily Contingent Planning and Occupational Depression on Activation



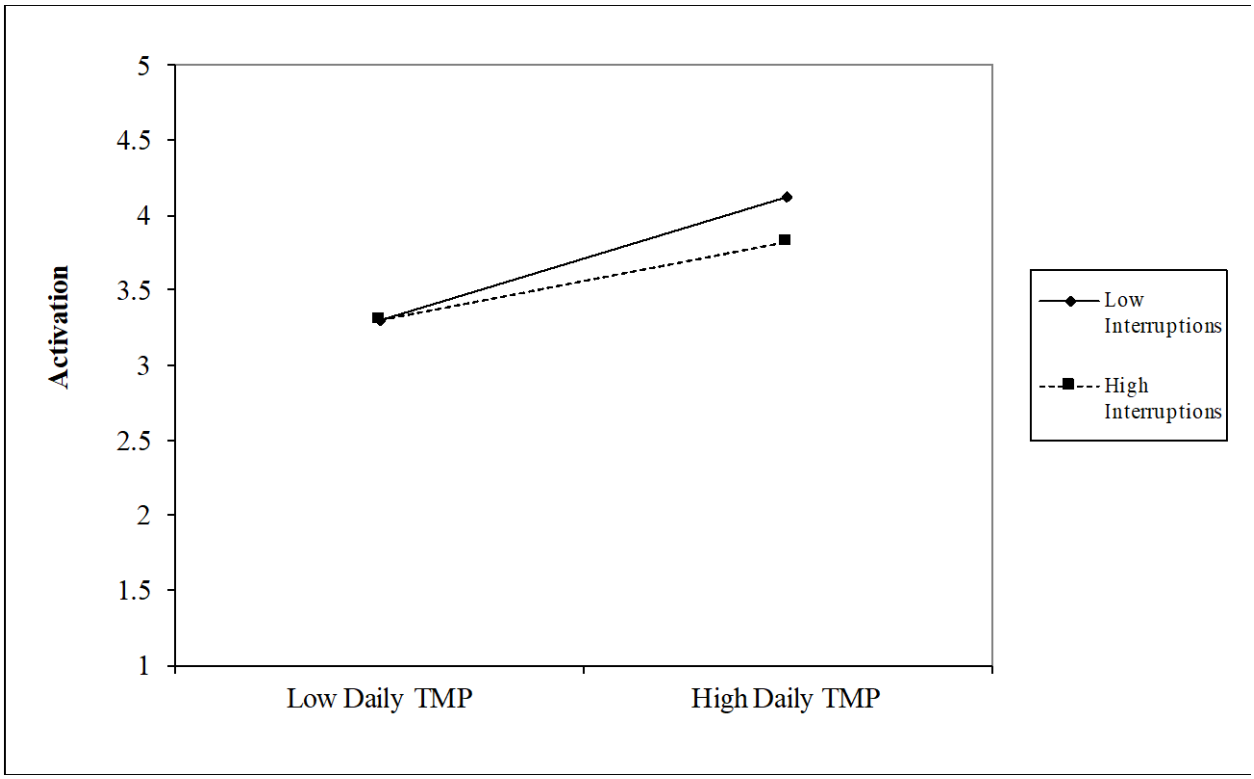
In contrast, as Figure 8 shows, the same effects are not consistent when discussing contingent planning. In this case, an individual with high levels of occupational depression had higher daily activation than those with lower levels of occupational depression. An individual who did not engage in daily contingent planning had the same activation as those who did, regardless of occupational depression: depression did not seem to matter for activation when contingent planning was low. But when an individual daily contingent plans, at best, it had no

effect on activation for high occupational depression, and, at worst, it lowered activation for an individual when they experienced high occupational depression.

Hypothesis 4b stated that interruptions will moderate the relationship between TMP and activation, and Hypothesis 5b stated that interruptions will moderate the relationship between contingent planning and activation. At the within-person level, daily interruptions significantly moderated the relationship between daily time management planning and daily activation (γ_{10} = -.10, *SE* = .03, $p < .001$). Figure 9 illustrates this effect: when an individual does not engage in daily time management planning, their activation is the same regardless of interruptions. But when an individual takes the time to schedule their activities daily, they are more activated daily when they experience low levels of interruptions. Interruptions can disrupt an individual's workflow and affect their motivation, and thus, their activation. However, daily interruptions did not significantly moderate the relationship between daily contingent planning and daily activation (γ_{10} = .03, *SE* = .02, p =.13). Thus, Hypothesis 4b was supported, but Hypothesis 5b was not.

Figure 9

Within-Person Two-Way Interaction Between Daily TMP and Interruptions on Activation



Discussion

In this study, I conducted a randomized controlled experiment to test the causal effects of planning at the between-person level. I also examined a multilevel model of planning, occupational depression, interruptions, activation, and performance, where time management planning and contingent planning lead to activation, occupational depression and interruptions moderate those relationships, and activation ultimately leads to performance. I investigated the effects at both the within-person and between-person levels. The results suggest slightly different findings for the within-person and between-person levels. At the between-person level, three of the four hypotheses were not supported; only Hypothesis 3a, that is, depression moderates the

relationship between planning and activation, was supported. However, at the within-person level, all four hypotheses were at least partially supported, and Hypothesis 3b was fully supported. This indicates that the effect of planning, as well as the moderating effects of depression and interruptions, might be best suited to examination at a daily level. Planning interventions only assessed at the between-person level may be missing key effects only observed at the within-person level of analysis.

Interestingly the relationship between time management planning and activation was always positive; at both the within-person and between-person levels, higher levels of time management planning led to more activation. However, the relationship between contingent planning and activation was negative at the within-person level, and positive at the between-person level. As such, participants in the contingent planning condition experienced higher levels of activation, but daily contingent planning seemed to lower an individual's daily activation. This seems to suggest that time management planning is more important for activation, particularly on a daily basis. Planning for interruptions did not seem to add anything stronger, particularly as interruptions did not moderate the relationship between contingent planning at the within-person or at the between-person levels. What seems to matter is that individuals plan their day, not that they are planning for interruptions.

At both the within-person and between-person levels, this study replicated Parke et al.'s (2018) finding that planning is important for performance. Additionally, at both levels, I found that occupational depression moderated the relationship between time management planning and activation, and between contingent planning and activation. It appears that both within-person and between-person occupational depression affects the extent to which an individual can become activated. There are between-person differences, but the extent to which an individual

plans and is activated on a daily basis is also dependent on their individual occupational depression.

This finding suggests that planning interventions must consider mental health as a possible moderator. The unconditional effects, without occupational depression as a moderator, would seem to suggest that the between-person planning intervention was not successful for increasing activation, and only within-person time management planning was successful for increasing activation. However, occupational depression significantly moderates all four hypothesized relationships, suggesting that not only is planning important for activation, but also that mental health, specifically occupational depression, is a key explanatory variable for why planning may work for some people and not others, and why planning may work for an individual on some days and not others. Without taking into account the moderating role of occupational depression, scholars may be missing true effects. Many employees are struggling with their mental health, as the global pandemic has taken a toll on employees (Santomauro et al., 2021), with the prevalence of depression reaching potentially as much as seven-times higher during the pandemic than before (Bueno-Notivol et al., 2021). Failure to account for mental health in intervention studies not only limits findings, but does a disservice to those employees who are struggling.

However, this study found that interruptions did not seem to have a significant moderating effect, in comparison to Parke et al. (2018). At the within-person level, interruptions only significantly moderated the relationship between time management planning and activation. Unlike Parke et al., interruptions did not moderate the relationship between contingent planning and activation. At the between-person level, interruptions did not significantly moderate at all. Although I examined activation rather than engagement, this finding suggests that interruptions

may not be as important as occupational depression in understanding how planning leads to performance.

Theoretical Contributions

This study adds to the self-regulation (Vancouver et al., 2014) and mental health literature by confirming that occupational depression impacts self-regulation and activation. As depression has been conceptualized as a failure of self-regulation (Strauman, 2012, 2017, 2021), this study shows that an individual's inability to self-regulate due to their occupational depression affects their activation and their performance. This provides a boundary condition for the effects of planning. Even if depressed individuals are able and willing to set their daily goals, occupational depression impacts the extent to which they are able to be activated. Importantly, this study shows that this effect holds at both the within-person and between-person levels: not only does someone's overall mental health make them less likely to be activated in comparison others, the individual's own mental health on a given day affects their daily activation, even if they engage in daily planning.

Further, this study contributes to the self-regulation and planning literature by examining two types of planning: time management planning and contingent planning. These types of planning were assessed within-person on a daily basis, as well as through a between-person intervention. Using a randomized control trial, I was able to establish a causal relationship between planning and activation. The significant between-person effects suggest that both time management planning and contingent planning increase activation, which ultimately increases work performance.

Limitations and Future Research

Although this study has many strengths, I must also note its limitations. First, although participants were asked to plan their day through the intervention, it is possible that some participants did not take the exercise seriously, and did not appropriately plan their day. Along the same vein, I only asked participants to plan five work-related activities, which may not have been sufficient to truly plan. Due to the time constraints of experience sampling to decrease participant fatigue and increase retention, I limited the scope of the planning intervention to only five activities, which may not have been substantial in terms of planning. Future research should consider expanding this intervention into a more intensive planning intervention, to investigate whether scheduling more than five work-related activities results in more substantial effects.

This research is also limited in my assessment of depression. Occupational depression provides a useful avenue to explore depression as a continuous variable within the context of work. However, once again, to limit fatigue, participants only responded to the Occupational Depression Inventory five times, rather than every day. As a relatively new construct and scale, analyses of its stability over time have not been thoroughly conducted. It is possible that a more nuanced view of daily change could be beneficial for investigating the impact of occupational depression within this context. Future research should consider examining within-person change in occupational depression to investigate its stability over time.

Additionally, I only investigated the impact of work interruptions. Given that 30-55% of the sample worked from home on any given day, it is possible that non-work interruptions may have a different effect than work interruptions, especially within the context of planning. Specifically, as contingent planning asks for ways to deal with interruptions while at work, individuals may not be considering interruptions from their home life, which could be biasing the

results. Future research should investigate different types of interruptions and their effects on activation and performance.

Notwithstanding these limitations, this study lays the foundation for several directions of future research. First, future research should continue to investigate the role of depression within the context of self-regulation. As new interventions come forward based on self-regulation, it is imperative that researchers do not omit the importance of mental health. As seen from the results of this study, occupational depression significantly moderated the relationship between planning and activation at both the between-person and within-person levels, suggesting an important effect. Failure to examine depression may result in what appear to be null effects, when, in reality, depression serves as an important moderator for the results. Future scholars investigating self-regulation, and planning in particular, must remain cognizant of the effects of depression.

Further, this study provides further evidence for the importance of a multilevel approach when investigating organizational behaviour. As researchers seeking answers to complex mental health questions, if we only use individual theories and research designs, our most common research strategy, we are missing out on critical information. Each level provides insight into mental health at work, but each is deficient on its own, giving us an incomplete overview. Even if results are consistently replicated, we cannot assume to have a complete understanding of mental health at work based on individual-level research. Employees experience daily fluctuations in their emotions, attitudes and behaviour, and even their levels of burnout (Basinska & Gruszczynska, 2020). Bono and colleagues (2013) found that within-person variance accounted for 60% of the variance in mental health complaints, further suggesting that between-person approaches may not be the most appropriate measure. Taking a snapshot, as is done with between-person research, assumes that our constructs are relatively stable over time, which does

not appear to be the case. The relationships tested at the between-person level may in fact be unrepresentative and biased. Within-person examinations allow researchers to take a more nuanced approach toward mental health, without assuming that constructs are stable. Future scholars investigating mental health within the context of work, and, specifically, within the context of self-regulation, must ensure they take into consideration the possible effects at these varying levels.

Conclusion

Understanding the relationship among motivation, mental health, and performance is critical as organizational scholars seek to develop workplace interventions. In this study, I combined experience sampling methodology with an experiment to investigate the effects of planning on activation and performance at both the within-person and between-person levels of analysis. I further explored occupational depression and interruptions as contingencies, suggesting that occupational depression is a critical moderator at both the between-person and within-person levels, although interruptions only had an effect at the within-person level. These findings further cement the calls to increasingly examine within-person effects to broaden our understanding of the relationship among motivation, depression, and performance.

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Chapter 5:

Final Conclusions

This research established that mental illness is an important component of the work experience. In this three-essay dissertation, I began with a brief overview of mental illness at work to set the stage and introduce the topic of mental illness. My first study systematically explores various workplace stressors of PTSD. I conducted a careful dissection of PTSD and trauma, and explored the relationship between them. After a systematic review, I explore how various workplace stressors, including bullying, exposure to violence, job demands, injury and sexual harassment, contribute to the development of PTSD symptoms. The results suggest that the workplace can have a profound impact on PTSD, with all stressors positively predicting PTSD symptomology. After conducting a moderator analysis based on the measure of PTSD and the occupational group studied, it appears that results differ based on PTSD measure and occupational group. I close with proposing a framework for studying workplace PTSD, the Cognitive Activation Theory of Stress model, to guide future research on workplace PTSD.

My second study systematically investigated leader mental health, seeking to answer the questions: (1) What are the predictors of leader mental health? and (2) Do leaders have better or worse mental health than employees at other levels? I explore burnout, stress, mental distress (including depression and anxiety), and sleep problems within the context of organizational leaders. The results suggest that leaders experience burnout, stress, depression, anxiety, mental distress, and sleep problems due to a variety of personal and situational factors: neither the individual nor the environment seems most responsible for leader mental health. Additionally, the various factors rarely easily fall into common occupational psychology health models, such as job demand-control or effort-reward imbalance. However, this review was unable to conclusively determine whether leaders experience better or worse mental health than

employees. For future researchers to answer this research question, I provide a guide to serve as a starting point for a new stream of research aimed at understanding and improving leader mental health.

Finally, I conducted a planning experiment to investigate the relationships among planning, activation, performance, occupational depression and interruptions, integrating motivational literature with work from clinical psychology. Using experience sampling and multilevel modeling, I found that the effects of planning on activation differ between levels, but activation is consistently related to performance. Additionally, occupational depression moderated the relationship between planning and activation at both levels, however, interruptions only significantly moderated the relationship between time management planning and activation at the within-person level, and did not moderate the relationship between contingent planning and activation at either level. By separating results at the between-person and within-person levels, I provide a more nuanced and detailed approach to investigating these relationships. The results suggest differing findings at the between-person and within-person levels, highlighting a need for future research to continue investigating planning at both levels of analysis. Further, the results highlight the importance of examining depression within the context of planning and self-regulation.

Overall, this set of studies comprehensively explores three different aspects of workplace mental illness: various aspects of the workplace lead to employees developing PTSD symptomology, leader mental health is due to a variety of personal and situational factors (though the research is still underdeveloped), and occupational depression plays an important role in the relationship among planning, activation, and performance.

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