Multidimensional Perfectionism and Psychophysiological Recovery from Work-Related Stress

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Disclosure Statement

The presented thesis has been completed by the author, Shannon Horan, under the supervision of Dr Paul Flaxman in accordance to the rules and regulations set forward by City, University of London. It should be noted that a portion of the data that was collected in the first and second empirical chapters were also used in the author's MSc dissertation project. Furthermore, the findings from the first empirical chapter were presented at the European Academy of Occupational Health Psychology conference in 2018 and at the Work, Stress, and Health conference in 2019, in addition to being published in the Journal of Occupational Health Psychology (Horan, Stride, & Flaxman, 2020).

Thesis Abstract

This thesis presents a programme of research which includes three empirical studies testing the impact of multidimensional perfectionism on psychophysiological recovery from work-related stress. Chapter one reviews the research on recovering from work-related stress and makes the case that adequate recovery is crucial for the maintenance of wellbeing. Specifically, the conceptualisation of recovery, the theories and methodologies that underpin recovery research, as well as an examination into the findings on the impact of recovery on employees' psychological and physical health will be discussed. Chapter two then explores multidimensional perfectionism and its conceptualisation, the methodologies used to study multidimensional perfectionism, the relationship with the dimensions and wellbeing, specifically exploring perfectionism in the workplace and its relationship to recovering from work-related stress.

Chapter 3 presents the first empirical research, which utilised a seven-week longitudinal design to examine the relationship between two higher-order perfectionism dimensions and school teachers' rate of recovery experienced during a half-term vacation and the rate at which the vacation benefits faded out once work resumed. A sample of 280 school teachers from the United Kingdom and the United States filled in measures of burnout and affective wellbeing on two occasions before the half-term, once during the half-term, and for four consecutive weeks following the half-term. Results for burnout measures over the seven weeks found that both dimensions of perfectionism had no relationship to the rates of recovery or fade out. However, perfectionistic concerns predicted more drastic growth patterns over the seven weeks for affective wellbeing, whereas perfectionistic strivings predicted a more stable trajectory in recovery and vacation fade out.

Chapter 4 includes the second study, which examined the within-person combination of multidimensional perfectionism and the relationship to school teachers' wellbeing during a working week and during a vacation week. Using the same sample of 280 school teachers, measures of negative and positive affect, as well as burnout, during a working week and during a half-term vacation were explored. The study tested whether the tripartite model of perfectionism or the 2x2 model of perfectionism were the best fit model for the combinations of perfectionism. The 2x2 model of perfectionism was found to be a better fit, and it was found that during the working week, there were significant differences between the subtypes and burnout, positive affect, and negative affect. However, during the vacation week, there was only significant differences between the subtypes of perfectionism and burnout, not affective wellbeing.

Chapter 5 presents the third empirical research, which explored the association between multidimensional perfectionism and psychophysiological recovery in the evening after the working day and during sleep. Specifically, measures of both objective wellbeing, in the form of evening HRV and nocturnal HRV, and subjective wellbeing, in the form of positive and negative affect and subjective sleep quality. The main aim of the research was to test whether worrying and ruminating in the evening moderated the relationships between perfectionistic strivings and perfectionistic concerns and the evening wellbeing measures, thus impeding the recovery experiences. A sample of 51 employees wore a heart-rate monitor for roughly 36 hours, which included two evenings and two sleeping periods. Results indicated that both perfectionistic strivings and concerns did not significantly account for the variance in the employees subjective and objective wellbeing in the evening after work. Additionally, worrying and ruminating in the

evening did not moderate the relationship between the two dimensions of perfectionism and the measures of wellbeing.

The final chapter includes the general discussion and presents the theoretical and methodological implications of these findings for research into both psychological and physiological recovery from work-related stress, as well as research into multidimensional perfectionism. Practical implications of the research findings, as well as the limitations of the presented research with recommendations for future research are also discussed.

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Chapter 1 Introduction

'Stress' is an ambiguous term which is typically used to describe varying degrees of physical and psychological phenomena that occurs within individuals. Hans Selye's original definition of stress outlines that stress is a non-specific bodily response to any demand for change (Selye, 1936). Seyle's model of stress was later developed and centred around homeostasis, which involves physiological systems functioning to maintain an internal stability. Systems within the body respond or react to environmental demands in order to sustain homeostasis (McEwen, 2005). Stress commonly refers to a prolonged imbalance between the internal resources and environmental demands or stressors (Jarvelin-Pasanen, Sinikallio, & Tarvainen, 2018). To clarify the cause and effect relationship within the word 'stress,' Selye recommended using 'stressor' as the cause and 'stress' as the effect (Fingret, 2000). For the purpose of this thesis, stress will refer to the psychophysiological reaction to an environmental stressor.

One of the most prevalent health risks of our present era is long-term stress, in particular, occupational or work-related long-term stress is a common health risk among our generations (Jarvelin-Pasanen, Sinikallio, & Tarvainen, 2018). The concept of work-related stressors and their impact on individuals' health and well-being has been a popular research topic for some time, but has recently seen an increase in interest. Starting in the early 1830's within the United Kingdom, the impact of one's employment on their physical health first emerged into written work by Charles Turner Thackrah. The Health of Munition Workers committee in 1915 was the first to discuss the psychological effects of work and recognised that long working hours reduced performance in fatigued workers (Fingret, 2000). Although, it was not until Cannon and Selye in the 1930's through the 1960's, where stress

began to be explored. This then accelerated the interest into stress research and the various forms and different contexts stressors were present (Bliese, Edwards, & Sonnentag, 2017).

In a review by Bliese and colleagues (2017), an examination on the history of stress research defined three eras of work-related stress research. The three eras included: a 50 year-era from 1917 to 1966, a 30-year era from 1967 to 1996, and a 20+ year era from 1997 to the present. The first era, between 1917 and 1966, is characterised by the theories of homeostasis and physiological processes of stress. The second era, between 1967 and 1996, is characterised by a focus on role stress, social support, and identifying moderators in stress relationships. Additionally, there were a number of studies that began investigating stress and individual differences, such as personality and coping styles. The final era, starting in 1997 to now, is characterised by explorations into burnout and possible resources to help with job-related stress. Overall, the development of work-related stress theories began with identifying occupational stressors and related stress or 'strains,' then explored the cognitive processes that perceive stress, and continues with the aim of gaining fuller understanding of stress within the workplace (Bliese, Edwards, & Sonnentag, 2017).

Today, workplace stress continues to be at the forefront of concerns for employees' mental and physical health. Employees are facing increased cognitive and emotional demands such as high workload and job insecurity, often accompanied with organisational demands, such as organisational change efforts (American Psychological Association, 2013; Casey, 2012; Eurofond, 2012; Sonnentag & Fritz, 2015). Work-related stress is often seen to be unavoidable, because employees are required to put effort into their work which causes varying levels of stress for each employee. Employees need to be in optimal physical and

psychological states to maintain high levels of focus, engagement, and overall energy (Bakker, 2011; Sonnentag & Fritz, 2015). Research has identified recovering from work-related stress as an important mechanism that explains how employees can stay both mentally and physically healthy, even when confronted with high job demands (Sonnentag, Binnewies, & Mojza, 2010; Trougakos, Beal, Green, & Weiss, 2008). Job-related stress in itself is not necessarily harmful for employees; however, if it carries into periods away from work (i.e., evenings, weekends, and vacation periods) without adequate recovery, this is when wellbeing begins to suffer.

There is an extensive literature on the impact of high demands within the workplace (Bakker & Demerouti, 2007; Lee & Ashforth, 1996), but only recently have researchers begun to emphasise the role of recovery for employees' health and wellbeing (Demerouti, Bakker, Geurts, & Taris, 2009). Recovery has been found to occur in the context of work and non-work. Firstly, within the context of work, this is referred to as internal recovery and occurs during short breaks, such as a break during a shift or a lunch break. Secondly, within the context of non-work, this is referred to as external recovery and occurs during after-work hours, such as evenings, weekends, and vacations (Demerouti et al., 2009; Geurts & Sonnentag, 2006). Recovering from workplace stress during longer non-working periods has been widely accepted as an important factor for maintaining employees' mental and physical health, thus this thesis will focus on external recovery. Within this introductory chapter, the research on recovering from work-related stress will be reviewed and will make the case that adequate recovery is crucial for the maintenance of wellbeing. Specifically, the conceptualisation of recovery, the theories and methodologies that underpin recovery research, as well as an examination of the findings on the impact of recovery on employees' psychological

and physical health will be discussed.

Theoretical Framework of Work-Stress Recovery

Work-stress recovery refers to the process of decreasing or eliminating psychological and physical strain that are a result of job demands and stressful events within the workplace (Meijman & Mulder, 1998; Sonnentag & Fritz, 2015). Exposure to unfavourable working conditions and situations places a strain on employees' psychophysiological systems, which can adversely impact individuals' health and wellbeing (for reviews, see Belkic, Landsbergis, Schnall, & Baker, 2004; De Lange, Taris, Kompier, Houtman, & Bongers, 2003). These strain reactions are only temporary, as long as respites are taken from work to allow the psychophysiological systems to return to normal or healthy levels (Geurts & Sonnentag, 2006). Conversely, if the stress-related activation systems occur repeatedly or remain activated, the effects of the stain are prolonged and can lead to harmful outcomes, such as chronic health disorders, disease, and even death (Geurts & Sonnentag, 2006; Stewart, Janicki, & Kamarack, 2006; Demerouti et al., 2009). Three theoretical models will be discussed which help to explain the role and conceptualisation of psychological and physical recovery.

Conservation of Resources Theory

A core theory that helps to explain why and how employees use non-working periods in order to recover from work-related stress is the Conservation of Resources (COR) theory (Hobfoll, 1989). The main assumption of the theory revolves around the notion that people are motivated to obtain, retain, protect, and build personal resources. Resources can differ and refer to personal characteristics, objects, energy, states, or anything else that someone might value. Stress develops when these resources are not achieved, threatened, or lost (Hobfoll, 1989). The

primacy of resource loss theory states that the loss of a resource is more harmful than the helpfulness of gaining a resource (Halbesleben, Neveu, Paustian-Underdahl, & Westman, 2014). As a result, continually experiencing resource threat or loss as a result of work-related stress is unlikely to be balanced by any comparable gain. Previous research has found that the continued experience of losing a resource can result in both psychological and physical ill-health (Halbesleben, Wheeler, & Paustian-Underdahl, 2013; 2014).

Within the workplace, personal resources, such as self-esteem and motivation, may be threatened or lost during a stressful working circumstance or situation. Therefore, employees will use non-working periods to restore these damaged or lost resources. This can be achieved by detaching from work and experiencing leisure activities that can recharge or replenish their batteries, or energy sources (Demerouti et al., 2009). Evenings, weekends, and longer vacations from work can give employees the chance to replenish lost resources, as well as gain new resources. Additionally, time away from work or during leisure time can in itself be a key resource that employees might value (Halbesleben et al., 2014). Thus, these periods would be a resource that employees might strive to protect. The conservation of resource theory highlights this because a respite from work may not only provide the chance for employees to replace or replenish their lost resources, but could also be an important personal resource that employees' need to retain and protect.

Effort-Recovery Model

The second core theory that explains the critical role of recovering from stress is the Effort-Recovery theory (E-R theory, Meijman & Mulder, 1998). The main assumption of the Effort-Recovery theory is that the energy and effort

expended at one's job is unavoidable. Each working day brings different tasks and responsibilities that need to be completed by each person in their job. No matter the size or importance of the task, all tasks and responsibilities require some amount of effort to be exerted. This effort is associated with acute load reactions, such as elevated blood pressure and accelerated heart rate, as well as feelings of being tired or fatigued. These load reactions, in principal, are adaptive because they are the body's way of coping with a stressful event or environment. However, recovering from the stress reaction is imperative to maintaining health, because it allows for load reactions to return to baseline levels. Without adequate recovery, the load reactions begin to accumulate which can lead to mental and physical ill-health (Demerouti et al., 2009; Meijman & Mulder, 1998).

On a biological level, the ability to exert effort is created by activating the Sympathetic–Adrenal–Medullary (SAM) system. This is done by secreting catecholamines, for example adrenalin and noradrenalin, which assist in regulating cardiovascular and sympathetic functioning. Under extreme stress, the Hypothalamic-Pituitary-Adrenal (HPA) system activates cortisol, also known as the stress hormone (Azam, Katz, Fashler, Changoor, Azargive, & Ritvo, 2015). Cortisol is released in order to exert additional effort when needed to deal with a particularly stressful event or situation. When functioning optimally, the stress-related load reaction would return to baseline levels after the stress event or situation has finished. For example, work-related stress reactions during the day would return to baseline levels during non-working hours in the evening. If recovery is completed before the next stress reaction, then there is no risk for ill-health. In this case, if complete recovery is experienced in the evening before the next working day, then the employee would be functioning at an ideal level (Demerouti et al., 2009).

However, if the employee fails to recover or has incomplete recovery during the evening, they may return to work the following day with residual load reactions. This re-occurs or prolongs the stress-related load reactions, thus sustaining sympathetic activation (Geurts & Sonnentag, 2006). This will result in the employee starting the next working day in a suboptimal condition and will require them to exert more energy to complete the tasks and responsibilities they have at work. The compensatory effort needed to deal with new stressors begin to accumulate or increase the intensity of load reactions. The accumulated load reactions will require more recovery, however the more load reactions the less likely it is that complete recovery will occur (Demerouti et al., 2009; Geurts & Sonnentag, 2006).

Both the prolonged exposure to work-related stress and the exposure to new stressors can be detrimental to employees' overall health and wellbeing, however the prolonged and continuous exposure has been found to be particularly detrimental. The continued activation of the psychophysiological systems from working periods to non-working periods is a risk factor for high sympathetic activation that can cause damage to the cardiovascular system. These systems need to be calmed and return to baseline levels when no longer exposed to work-related stress, like in the evening after the working day. Detaching or disconnecting from work is an important aspect of the recovery experience. This includes detaching physically from work, such as not continuing to work on a project in the evening or checking and answering emails outside of work. Additionally, one must also detach psychologically from work, meaning disengage from thinking about work in the evening. Ruminating about past stress and worrying about possible upcoming stress are two forms of perseverative cognition that can impact employees' ability to detach from work in the evening and impair their recovery experience (Brosschot, Pieper, & Thayer, 2005).

Allostatic Load Model

The third and final recovery theory is similar to the Effort-Recovery theory in that it also explains the critical role of recovering from stress-induced load-reactions, this theory is the Allostatic Load theory (McEwen, 1998). Allostatic load theory describes that the normal day-to-day load reactions that accompany daily effort at work can be alleviated during non-working periods. The allostatic load theory focuses on work-related stress and its long-term impact on employees' psychophysiological health. The theory uses cardiovascular parameters as health indicators to evaluate both the exposure and reaction to stress, in addition to the process of recovery after exposure to stress (McEwen, 1998).

The allostatic load theory is grounded in our biological response or reaction to stressors. The natural process that organisms use to maintain homeostasis, also referred to as internal stability, is known as allostasis (Tonello, Rodrigues, Souza, Campbell, Leicht, & Boullosa, 2014). Stressors cause instabilities to homeostasis, which in turn activates internal mechanism that try to stabilise and lessen any damage caused by the stress response. A healthy response to stress-exposure contains three steps. First, the systems initiate a response in an attempt to adapt to the current stressor. Second, there is a sustained response reaction to this stress until the situation comes to an end and the load reactions end. Third, the response is switched off or alleviated after the stressor is no longer having an impact on the psychophysiological systems. The systems then will enter a state of rest or recovery (Demerouti et al., 2009; McEwen, 1998).

However, if the sustained response remains activated for a prolonged period and recovery does not occur, the psychophysiological systems remain activated leading to continued exposure to stressors. This can leave an employee in a state of

distress for long periods of time, which in turn weakens the employee's psychological and physical health, and can lead to both short-term and long-term health-related issues (Fritz, Sonnentag, Spector, & McInroe, 2010; Meijman & Mulder, 1998). When exposure to stressors are continued or constant, the allostatic load experienced may alter the individuals' stress-sensitive systems that are linked to the pathophysiology of many diseases (Juster, McEwen, & Lupien, 2010). The most researched and documented of stress-related disorders is cardiovascular disease, which is also the leading cause of death worldwide (World Health Organisation, 2011). Occupational stress has been suggested to considerably increase the employees' risk for cardiovascular ailments (Thayer, Yamamoto, & Brosschot, 2010; Tonello et al., 2014).

Empirical Findings for Work-Stress Recovery

Within the theoretical models, recovery has been defined in several ways. Overall, recovery occurs after a strain reaction is triggered and when the stressor is no longer present (Sonnentag & Geurts, 2009; Demerouti et al., 2009). Recovery represents the reparative process needed following a stress-induced strain to return to baseline functioning (Sonnentag & Natter, 2004). Recovering from work-related stress during non-working periods is both a psychological and physiological process. Non-working periods can include the evening after the working day, sleeping periods in the evening, weekends for those that work a typical Monday to Friday job, and longer vacation periods. The following section will explore psychological recovery from work-related stress, as well as explore the findings of subjective measures of wellbeing. Additionally, physiological recovery from work-related stress in non-working periods will also be discussed, including an exploration into objective measures of wellbeing. Lastly, this section will also

examine sleep as an important factor for properly recovering from work-related stress.

Psychological Recovery from Workplace Stress

Within the workplace, there are many stressors that are experienced by employees that may impact their psychological wellbeing. Such stressors include, but are not restricted to, managerial pressures and tensions, job uncertainty, organisational change or restructuring, approaching deadlines or targets, the introduction of new technologies, and more (Sparks, Faragher, & Cooper, 2001). Research has begun to explore how employees are able to recover from these work-related stressors, which have a direct impact on their psychological wellbeing.

A daily diary study conducted by Bakker, Van Emmerik, Geurts, and Demerouti (2008) tested the predictions of the effort-recovery and conservation of resources theories. They examined the role of job demands, work engagement, and performance in relation to daily recovery. The results of the study found that daily work engagement is a predictor of daily work performance and is a function of recovery in the evening between working days. Furthermore, it was found that recovery moderated the relationship between job demands and work engagement. Daily job demands were related to work engagement, but only if employees were able to have adequate recovery in the evening from the previous working day. This suggests that sufficient recovery can turn job demands into challenges for employees to complete. This study highlights the importance of day-to-day recovery for work engagement and performance, and reinforced that work demands are only damaging for employees if they have insufficient opportunity to recover from the load reactions that the working day builds (see also Geurts & Sonnentag, 2006; Totterdell, Spelten, Smith, Barton, & Folkard, 1995).

To explore recovery experiences, Sonnentag and Natter (2004) explored the degree to which employees perceived that the activities they pursued during non-working periods helped them recover and restore their energy resources. Participants were given a list of evening activities and were asked to indicate next to each activity the amount of time they spent on that particular activity. Then they were asked to specify the degree to which they felt they had recovered after performing the different activities. In doing so, the researchers were able to investigate the strategies employees use to recover from workplace stress (Sonnentag & Fritz, 2007). They found that time spent on physical activities, such as sports and exercise, significantly predicted lower levels of depression and higher amounts of vigour. Additionally, time spent on work-related activities were found to predict higher levels of fatigue and lower levels of vigour (Sonnentag & Natter, 2004).

Another way researchers have operationalised recovery is to use self-report measures of wellbeing as a representation of whether employees have been able to recover during non-work periods (Kühnel & Sonnentag, 2011; Rook & Zijlstra, 2006; Sonnentag & Geurts, 2009). The assumption is that elevated levels of wellbeing or lower levels of negative outcomes, such as burnout or fatigue, can be used to identify individuals who have been able to recover from the effects of the workday. Conversely, reduced levels of wellbeing or elevated levels of negative outcomes indicate poor or insufficient recovery. This technique is often used when exploring recovery over longer periods of time, such as during a vacation from work.

Recovering from work-related stress during a vacation. A vacation is defined as a planned break from an employee's job when they are not actively participating in their work (Lounsbury & Hoopes, 1986; Strauss-Blasche, Muhry,

Lehofer, Moser, & Marktl, 2004). The duration of a vacation can vary, but they typically range from 1 to 3 weeks. Vacations are unique in the way that they offer a removal from normal day-to-day routines and job demands. This, in turn, allows for energy resources to be replenished more completely and gives the psychophysiological systems the opportunity to return to baseline levels (Kühnel & Sonnentag, 2011). Vacations offer longer and usually uninterrupted respite durations, which encourages psychological detachment from work. Therefore, vacations are likely to lead to fuller or complete recovery compared to evenings and weekends; this is often called 'the vacation effect' (de Bloom, Geurts, & Kompier, 2012; de Bloom, Geurts, Sonnentag, Taris, de Weerth, & Kompier, 2011; de Bloom, Kompier, Geurts, Weerth, Taris, & Sonnentag, 2009).

Without the impact of work-related stress on employees during a vacation period, employees typically experience improvements to their mental and physical health. Researchers have found that vacations offer the opportunity for employees to improve levels of workplace stress (Eden, 1990), reduce burnout (Westman & Eden, 1997), and enhance general health and wellbeing (de Bloom et al., 2011). Unfortunately, vacations do not buffer the effects of work-related stressors when employees return to work. High workload upon resuming work has been found to eliminate the positive vacation effects (Strauss-Blasche, Ekmekcioglu, & Marktl, 2002; Strauss-Blasche et al., 2004). Employees are re-introduced to their typical day-to-day work routine, job and life demands, which leads to the decline of vacation effects; this is referred to as the 'fade out' of the benefits gained during the vacation.

Previous research has found that without the active work stressors, employees had increased wellbeing during a vacation, but their wellbeing decreased

rapidly and returned to pre-vacation levels within three (Westman & Eden, 1997) and four weeks once work resumed (Kühnel & Sonnentag, 2011; Strauss-Blasche et al., 2004; Westman & Etzion, 2001). A meta-analysis conducted by de Bloom and colleagues (2009), found that vacation effects fade out roughly between two and four weeks after work resumes (de Bloom et al., 2009). Later research found that all of the positive benefits gained from a vacation faded out within one week (de Bloom Geurts, Weerth, Taris, Sonnentag, de Weerth, & Kompier, 2010) and even within three days when returning to work (de Bloom et al., 2012).

Physiological Recovery from Workplace Stress

Exposure to working conditions and situations that are stressful cause a strain reaction on employees' psychophysiological systems (Belkic et al., 2004; De Lange et al., 2003). These strain reactions are temporary if respites are taken which allow the psychophysiological systems to return to normal or baseline levels (Geurts & Sonnentag, 2006). However, if the stress occurs repeatedly or the stress reactions remain activated, the effects of the strain reaction are prolonged and can lead to chronic health disorders, disease, and mortality (Demerouti et al., 2009; Geurts & Sonnentag, 2006; Stewart, Janicki, & Kamarack, 2006). Research has begun to explore how employees' stress-activation systems recover from work-related stress and the impact it has on their physiological wellbeing.

Poor recovery can be manifest in elevated levels of neuroendocrine activity during non-work time. This can be represented as elevated levels of catecholamines, such as adrenaline and noradrenaline, and as cortisol (Sonnentag & Geurts, 2009). A review conducted by Fritz and Sonnentag (2006) found that after high intensity workings periods, stress is increased and results in catecholamine levels remaining elevated for longer periods of time, which is an indication of poor physiological

recovery. When workload is high, it has been found to increase adrenaline levels during the evening, whereas when workload is low or average, adrenaline levels are able to return to baseline levels in the evening (Meijman, Mulder, van Dormolen, & Cremer, 1992).

In a study among couples, Saxbe, Repetti, and Nishina (2008) examined evening recovery by exploring relationships between self-reported daily work stress and evening cortisol levels. They found that for both men and women, evening cortisol levels were higher on days with increased workload. These neuroendocrine hormones initiate sympathetic activation, therefore elevated cardiovascular activation after exposure to work-related stressors are also indicators of poor physiological recovery (Glynn, Christenfeld, & Gerin, 2002; Saxbe, Repetti, & Nishina, 2008).

HRV as a biomarker for physiological recovery. Another commonly used marker of cardiac health and stress recovery is heart rate variability (HRV). HRV is the measure of the difference in time between each adjacent heartbeat (Shaffer, McCrafty, & Zerr; 2014). The cardiac response to stressors involves sympathetic nervous system activation wherein sympathetic nerve fibres release excitatory neurotransmitters, epinephrine and norepinephrine, onto the heart's sinoatrial node, which then accelerates heart rate. In order to recover from the stress, parasympathetic influence needs to be reinstated through vagal nerve activation and its associated release of acetylcholine, which is a neurotransmitter that inhibits the heart's sinoatrial node and decelerates heart rate (Cacioppo, Tassinary, & Bernston, 2007; Karim, Hasan, & Ali, 2011; Thayer, Ahs, Fredrikson, Sollers, & Wager, 2012). As a result, HRV is the measure of this beat-to-beat variation in heart rate and is widely accepted as a biomarker for this sympathetic and parasympathetic

nervous system activity (Azam et al., 2015).

Stressors trigger a psychophysiological reaction, which then prompts cardiovascular activation via the autonomic nervous system, and the discrepancy in HRV is used as an indicator of continuous and real-time parasympathetic functioning (Allen, Chambers, & Towers, 2007; Azam et al., 2015; Fabes & Eisenberg, 1997, Taelman, Vandeput, Spaepen, & Van Huffel, 2009). The parasympathetic influence on the heart rate is mediated by the vagus nerve. The vagus nerve is a cranial nerve which comes from the medulla oblongata and extends through several branched connections to internal organs and tissues, which enables communication with brain structures (Bernston et al., 1997; Cacioppo, Tassinary, & Bernston, 2007; Porges, 2011; Thayer, Hansen, Saus-Rose, & Johnsen, 2009). Insufficient parasympathetic functioning, demonstrated by reduced HRV, can have an impact on the ability to relax and can result in poor recovery (Brosschot, Gerin, & Thayer, 2006).

To account for the evidence of the relationship between HRV and wellbeing, two major theories on autonomic nervous system function have been developed, namely the polyvagal theory (Porges, 1995) and the neurovisceral integration theory (Thayer et al., 2009). Porges proposed the polyvagal theory to explain how adaptive social functions are controlled by vagal tone (Porges, Doussard-Roosevelt, & Maiti, 1994; Porges, 2001; 2011). Examples of adaptive social functions include threat recognition, vocalisation, and nonverbal communication. Stress reduces vagal tone because it disrupts homeostasis, which explains why sympathetic nervous system activation occurs during challenging social and psychological experiences (Porges, 1992; 1995). Research has found associations between vagal tone and self-regulatory behaviours, including impulse control, social support seeking, and

positive self-talk (Geisler, Kubiak, Siewert, & Weber, 2013). From an evolutionary viewpoint, the polyvagal theory offers an understanding of the social engagement system, which is crucial in the context of the workplace.

According to the neurovisceral integration theory, emotional, cognitive, and related physiological responses emerge from a subsystem of brain networks that can be recorded by HRV (Thayer et al., 2012; 2009; Thayer & Lane, 2000). This system is known as the central autonomic network, which works as a neurophysiological response centre. The central autonomic network uses inhibitory control via inputs from prefrontal brain regions and the brainstem, specifically the myelinated vagus nerve. Using neuroimaging analyses, prefrontal cortex activity associated with HRV changes have been found to interact with the amygdala and ventromedial prefrontal cortex. These regions are involved in emotional response and emotional regulation (Thayer et al., 2012). The central autonomic network regulates emotional responding and regulation, which is reflected in the size and duration of cardiac activation when threat or stress appraisals are made.

Both the polyvagal theory and the neurovisceral integration model offer explanations of how attention and emotion regulation processes can be reflected in the measure of HRV. The polyvagal theory describes the connections between the vagus nerve and structures involved in social engagement. Whereas, the neurovisceral integration model described the links between the autonomic nervous system and brain regions. Both theories come together in the idea that neuro-inhibitive influences on autonomic arousal function optimally when regulated by the parasympathetic vagus nerve which generates attentional, emotional, and physiological functions during an encounter with a stressor (Porges, 1995; Thayer et al., 2009. These theoretical principles can be incorporated into recovery research to

investigate vagal functioning in employees when they are recovering from work-related stressors.

For over a century, scientists have been studying and suggesting connections between autonomic nervous system activation and mental states (Ernst, 2017). The empirical investigation of HRV grew in the 1960s and 70s with the emergence of modern signal processing equipment, and thereafter research rapidly increased and is still expanding today (McCraty & Shaffer, 2015). As research into HRV increased, so did the different ways in which to record, process, and analyse HRV data. HRV can be assessed from different analytical approaches. Specifically, within the raw data, the interactions between autonomic neural activity, respiration, blood pressure, and higher level control systems produce rhythms within HRV measurements. The most common form for observing these changes is the heart rate tachogram, which is a plot of the intervals between heartbeats (McCraty & Shaffer, 2015). Different types of indices or metrics can be utilised to measure HRV and investigate different sections of the raw HRV data, including time-domain measures, frequency-domain measures, and non-linear measures (Shaffer & Ginsberg, 2017). In an attempt to standardise the use of HRV, the Task Force of the European Society of Cardiology and North American Society of Pacing and Electrophysiology (1996) was assembled which produced a report with the aim of regulating the use of HRV. Following their guidelines, this thesis will utilise the standard deviation of the inter-beat-interval of normal sinus beats (SDNN) when exploring HRV. SDNN reflects an overall HRV score and is the most commonly used time-domain HRV parameter when exploring occupational stress (Jarvelin-Pasanen, Sinikallio, & Tarvainen, 2018).

HRV is used in many different fields of study, however within psychology

research, higher levels of HRV are typically used as an indication of adaptability and a better activation of the stress response (Ernst, 2017). Organisational psychology research has begun to use HRV has a biomarker for the internal self-regulatory systems and as a possible indicator of poor health and wellbeing within the workplace. A recent review of the literature, by Jarvelin-Pasanen, Sinikallio, and Tarvainen (2018), explored research into occupational stress and HRV. They identified ten articles published in the last fifteen years. The overall findings showed that occupational stress was associated with lower HRV. They also highlighted that the analysis of HRV can be used in research as an informative marker for the impact work-related stress has on physiological health (Jarvelin-Pasanen, Sinikallio, & Tarvainen, 2018).

Additionally, Jarvelin-Pasanen and colleagues pointed out that the current technology used for detecting HRV is non-invasive and effective for investigating occupational stress and psychophysiological health. Furthermore, there are now wearable devices that allow for reliable long-term data collection (24 to 48 hours), which can be utilised at work, during leisure-time activities, and while sleeping. Most previous research was conducted in laboratory-based conditions, often with students or healthy subjects, therefore little is known about employee HRV in normal day-to-day situations. The inclusion of psychophysiological indicators of work-related stress, such as HRV, would enhance understanding and aid in early prevention of detrimental effects that prolong stress activation can have on employees (Jarvelin-Pasanen, Sinikallio, & Tarvainen, 2018).

Sleep as an indicator of recovery from workplace stress

A fundamental indicator of prolonged psychophysiological activation is when stress activation is remaining responsive into periods when the stressor is no

longer present. Sleep occurs as an extension of the evening recovery period and represents a period completely absent of any active work-related stressors (Brosschot, Van Dijk, & Thayer, 2007). Sleep is a central phase of recovery and is a crucial period of daily recovery (Berset, Elfering, Lüthy, Lüthi, & Semmer, 2011). Sleeping well is the most critical natural period for successful psychological and physical restoration and for preventing long-term negative effects of stress on health (Brosschot, Van Dijk, & Thayer, 2007). Sleep is especially important for restoring energy resources and systems in the brain (Porkka-Heiskanen, Kalinchuk, Alanko, Urrila, & Stenberg, 2003).

Research into sleep has shown that insufficient sleep, either poor quality or quantity, shows associations with many different health impairments (Åkerstedt, 2006). While exploring global sleep scores, Schwartz and colleagues (1999) found an association between poor sleep and coronary heart disease. Further research went on to find that individuals with insomnia report having more health problems such as heart disease, high blood pressure, neurological disease and gastrointestinal problems (Taylor, Mallory, Lichstein, Durrence, Riedel, & Bush, 2007). Furthermore, it has been found that the development of diabetes can be predicted by self-reported difficulties falling asleep (Nilsson, Rööst, Engström, Hedblad, & Berglund, 2004). Sleep also has effects on psychological health and wellbeing. Elovainio, Kivimäki, Vahtera, Keltikangas-Järvinen, and Virtanen (2003) found that poor sleep was associated with more minor depression, social dysfunction and poorer self-rated health scores. In a multilevel research study on insomnia, it was found that insomnia was related to increased hostility and fatigue, as well as decreased cheerfulness, attentiveness, and job satisfaction (Scott & Judge, 2006). Overall, having sufficient sleep is very important for physiological and

psychological wellbeing.

One major factor that affects sleep is stress at work (Åkerstedt, Fredlund, Gillberg, & Jansson, 2002; Burgard & Ailshire, 2009). Stress leads to psychological and physiological arousal in response to an initial stressor, which can then lead to impacts on sleep due to repetitive or continued arousal (Åkerstedt, 2006). Ribet and Derriennic (1999) were the first to show such a link between work stress during the day and subsequent sleep disturbances. Further research went on to show that 'hectic' work was positively associate with fatigue and subsequent sleep disturbances (Åkerstedt et al., 2002). Using the demand-control-support model, it was found that change from low to high job strain was associated with increased fatigue and poor sleep (De Lange, Kompier, Taris, Geurts, Beckers, Houtman, & Bongers, 2009). Using the effort-reward imbalance model, it was found that that being in the highest quartile of effort-reward imbalance was associated with a higher prevalence of sleep disturbances (Fahlén, Knutsson, Peter, Akerstedt, Nordin, Alfredsson, & Westerholm, 2006). In sum, there is convincing evidence concerning a relationship between stress at work and impaired sleep.

Overall, without proper recovery in the evening from work-related stress, the activation of psychophysiological stress systems will continue into the sleeping period, which can lead to detrimental health risks. Examining the relationship between work stress, psychological and physiological recovery, and sleep remain important research areas due to their central role in the development and maintenance of the aforementioned disorders and diseases. Additionally, possible individual differences that might predispose employees to experiences of poor psychophysiological recovery and sleep is imperative to explore, in order to identify those that might be more at risk. One such individual difference that might

impact employees' recovery experiences is perfectionism. Within the next chapter, perfectionism and its relationship to workplace stress and recovery will be discussed.

Chapter 2 Introduction

Research examining employees' wellbeing has typically focused on organisational-level factors, such as work demands and workload. However, research within the last couple of decades has expanded by including a focus on individual factors and differences that may play a role in employees' work-related health (Lazarus, 1995). One such individual difference that has begun to be explored is perfectionism. Perfectionism is defined as the combination of setting extremely high standards for oneself, striving for flawlessness, and the tendency to critically evaluate one's own behaviour (Childs & Stoeber, 2010; Hill & Curran, 2016; Stoeber, Edbrooke-Childs, & Damian, 2016; Stoeber & Rennert, 2008). Perfectionism is now widely accepted as a multidimensional personality trait or disposition (e.g., Hill & Curran, 2016; Stoeber & Gaudreau, 2017). Specifically, various perfectionistic facets and characteristics have been found to cluster into two higher-order dimensions known as *perfectionistic concerns* and *perfectionistic strivings*.

The concept of perfectionism is fairly familiar for most, however since most of the research on perfectionism lies across various disciplines, its function within the workplace is unclear (Harari, Swider, Steed, & Breidenthal, 2018). Perfectionism can be found in many areas of life; however, the work domain has been recognised as the most likely life domain to foster perfectionistic tendencies (Stoeber & Stoeber, 2009). Particularly due to the fact that the workplace harbours interpersonal, performance, and achievement-related stressors (Harari et al., 2018). The need that perfectionists feel to be to be flawless, including having anxiety over making mistakes, tends to be heightened within the working environment due to the desire to have a successful career. Additionally, at the organisational level, there is

an assumption that this need to be perfect is beneficial to the organisation, which leads to the view of perfectionism as a value, or at the very least a desirable weakness (Ozbilir, Day, & Catano, 2014; Stoeber & Damien, 2016). However, research continues to find that the consequences of striving for perfection outweigh any benefits for employees' individual health and wellbeing (Harari et al., 2018). Thus, there lacks a universal understanding of whether perfectionism is a helpful or harmful personality trait for employees to have.

This chapter will explore multidimensional perfectionism and its conceptualisation and the methodologies used to study multidimensional perfectionism. Additionally, this chapter will explore the relationships between the dimensions and wellbeing, particularly focused on recovering from work-related stress during non-working periods.

The Conceptualisation and Measurement of Multidimensional Perfectionism

When perfectionism first emerged in research, it was viewed from the perspective of psychodynamic theory, which emphasised that it was a personality disorder associated with a range of negative characteristics and outcomes (Stoeber & Otto, 2006). Perfectionism was seen as being unidimensional, specifically understood as a cognitive factor which consisted of irrational beliefs and dysfunctional attitudes (Burns, 1980; Ellis, 1962; Weissman & Beck, 1978). It was not until Hamachek (1978), that perfectionism was proposed to be multidimensional, specifically including two facets which were labelled 'neurotic perfectionism' and 'normal perfectionism' (Hamacheck, 1978; Slade & Owens, 1998; Stoeber & Otto, 2006). Neurotic perfectionism was seen to be motivated by high standards, however this dimension differed from normal perfectionism because the neurotic aspects were founded in striving for perfection motivated by a fear of failing or

disappointing others. Normal perfectionism, on the other hand, was seen as being motivated to achieve high standards, and was associated with high self-esteem and self-satisfaction. This model began the conceptualisation of perfectionism as a multifaceted or multidimensional personality trait, which allowed for further exploration into whether perfectionism encompasses features that might be ambivalent or even positive (Childs & Stoeber, 2010; Hill & Curran, 2016; Stoeber & Rennert, 2008).

Then, in the 1990's, two models of multidimensional perfectionism were developed. The first was created by Frost, Martin, Lahar, and Rosenblate (1990), and focused on self-directed cognitions including personal standards, concerns over making mistakes, doubts about actions, as well as parental pressures and expectations. The second, by Hewitt and Flett (1991b), focused on where perfectionistic believes stem from and were directed towards (either internally or externally). Each of the models were developed with a corresponding measurement scale, both named the Multidimensional Perfectionism Scale (Frost et al, 1990; Hewitt & Flett, 1991b).

Hewitt and Flett's Multidimensional Perfectionism Scale. Hewitt and Flett (1991b) recognised the fact that previous researchers had theorised perfectionism as having a neutral or positive aspect, specifically in terms of achievement (Hamachek, 1978). However, they also emphasised that perfectionism is also related to negative aspects such as low self-esteem, anxiety, and depression (Burns & Beck, 1978; Hamachek, 1978; Pacht, 1984). Based on these conflicting perceptions, Hewitt and Flett suggested that perfectionism consisted of both intra- and inter-personal components. Thus, Hewitt and Flett's multidimensional perfectionism model was formed and consisted of three main facets, known as self-

oriented perfectionism, socially prescribed perfectionism, and other-oriented perfectionism (Hewitt & Flett 1991b).

The main differentiation between the subscales is whom perfectionistic beliefs stem from and to whom perfectionistic behaviour is directed. Specifically, self-oriented perfectionism involves perfectionistic thoughts and behaviours stemming from and directed to the self. Essentially, the self-oriented perfectionist just wants to be perfect for themselves and sets themselves high standards in order to achieve a level of perfection they perceive. Whereas, socially prescribed perfectionism involves perfectionistic beliefs that stem from others, but the perfectionistic behaviours are directed towards the self. Basically, the socially prescribed perfectionist thinks other people expect perfection from them, regardless of whether the reality of that is true or not. Lastly, other-oriented perfectionism describes perfectionistic behaviours that are directed towards others (Hewitt & Flett, 1991b). This is someone who expects other people to be perfect, regardless of the standards they hold for themselves.

Self-oriented perfectionism is characterised by setting high standards for themselves and striving to be as flawless as possible. The self-oriented perfectionist is motivated by both striving for perfection and avoiding any potential failures (Hewitt & Flett, 2002). Some research has shown self-oriented perfectionism to be associated with adaptive outcomes (Kilbert, Langhinrichsen-Rohling, & Saito, 2005); however, Hewitt and Flett (2002) claim that the failure to meet extremely high personal expectations can lead to a range of maladaptive outcomes (Cooper, Cooper, & Fairburn, 1985; Flett, Hewitt, & Dyck, 1989; Garner, Olmstead, & Polivy, 1983).

Socially prescribed perfectionism (SPP) includes the belief that other people

expect flawlessness from them, which includes the idea that others are evaluating them and putting pressure on them to be perfect (Hewitt & Flett, 1991b). Socially prescribed perfectionism has been found to be associated with a range of negative outcomes including anxiety, depression, and self-harm in adolescent school children (Einstein, Lovibond, & Gaston, 2000; O'Connor, Rasmussen, & Hawton, 2010), suicidal ideation (Hewitt, Flett, & Turnbull-Donovan, 1992), professional distress, and low job satisfaction (Flett, Hewitt & Hallett, 1995).

Other-oriented Perfectionism (OOP) refers to the tendency to demand perfection from others, which can lead to a perceived consistent failure from others when they are unable to meet the standards. This is then associated with interpersonal problems such as lack of trust and feelings of hostility towards others and their imperfections (Hewitt & Flett, 1991a). This facet of perfectionism is unlike self-oriented and socially prescribed perfectionism as it is studied from a social perspective. It has been shown to be distinct from the other facets and is often left out of research when exclusively exploring intra-personal perfectionistic beliefs (Hewitt & Flett, 1991b).

Frost's Multidimensional Perfectionism Scale. Frost, Martin, Lahart, and Rosenblate (1990) found a major difference between Hamachek's (1978) normal and neurotic perfectionists, specifically in the way they are able to tolerate mistakes. Normal perfectionists were suggested to allow themselves to be less precise and make mistakes, while still appraising their work as a success. Whereas, neurotic perfectionists often do not allow themselves to make mistakes, often feeling nothing is good enough and in turn are overwhelmed by the fear of failure. Frost and colleagues (1990) argued that there lacked a scale that addressed these core components of perfectionism, until they developed their multidimensional

perfectionism scale. The Frost's Multidimensional Perfectionism Scale (FMPS) consists of six subscales or aspects of perfectionism which includes personal standards (PS), concerns over mistakes (CM), doubts about actions (DA), parental expectations (PE), parental criticism (PC), and organisation (O).

Personal standards include setting high standards for oneself and focusing on achieving these standards. Those with high personal standards do recognise that the goals they set for themselves are higher than other people, but they also expect more of themselves than others do. Concerns over mistakes include having an excessive concern about making a mistake and a fear of disappointing others or being rejected by others when mistakes are made. Those with high concerns over mistakes commonly employ catastrophic thinking, specifically in regards to viewing even a minor mistake in a task as failing the whole task. They often compare themselves to others and believe that they are less successful than those around them, which in turn results in them feeling inferior amongst others. Doubts about actions is seen as a more compulsive aspect of multidimensional perfectionism and refers to the tendency to repeatedly re-do tasks until they believe they have completed it to its required standard. Even when the task is completed, they are rarely satisfied with the completed product of their efforts. The doubt in their actions have been linked to a discrepancy in knowing when or feeling like a task is completed, as well as a fear of being evaluated or a fear of failure once the task is completed (Frost et al., 1990; Solomon & Rothblum, 1984).

Parental expectations and parental criticism are considered antecedents of perfectionism (Stoeber & Otto, 2006). Both are heavily reliant on the belief that parents' love is conditional, and if they experience any failures or make any mistakes they will be rejected by their parents. Depending on the sample being

investigated, these dimensions become more or less salient, specifically parental expectations and criticisms are more prominent in younger populations, and are not typically relevant in workplace samples. Organisation refers to a strong focus on details and a preference for precision, order, and neatness (Frost et al., 1990; Frost & Dibartolo, 2002). This aspect of perfectionism is not directly associated with excessive goal setting, and had been found to be weakly associated with the other subscales within the FMPS (Frost et al., 1990).

Two higher order dimensions of perfectionism. The conceptualisation of perfectionism as a multifaceted or multidimensional personality disposition lead to the creation of the two multidimensional perfectionism scales, specifically the MPS (Hewitt & Flett, 1991b) and the FMPS (Frost et al, 1990). Factor analytic work was then conducted to directly compare the two measurement scales, in order to test how the different sub-facets, relate to one another and to test whether there was a higher-order structure which includes both of the scales.

Frost, Heimberg, Holt, Mattia, and Neubauer (1993) conducted an exploratory factor analysis with all nine sub-scales of the combined MPS scales, and found a two-factor solution which reflected a maladaptive evaluative concerns dimension of perfectionism and a positive achievement striving dimension of perfectionism. The first dimension consisted of concerns over mistakes, doubts about actions, anf parental criticism from the FMPS, as well as socially prescribed perfectionism from the MPS. This maladaptive evaluation concerns dimension was associated with negative affect. The second dimension included personal standards and organisation from the FMPS and self-oriented perfectionism from the MPS. This positive achievement strivings dimension of perfectionism was associated with positive affect. The parental expectations sub-scale from the FMPS and the other-

oriented perfectionism sub-scale from the MPS were not associated with either dimension. Similarly, Stumpf and Parker (2000) explored the factor structure of just the FMPS and found a similar higher-order structure that they labelled healthy perfectionism and unhealthy perfectionism.

Following the results of the exploratory factor analyses, Cox, Enns, and Clara (2002) used confirmatory factor analysis to explore the second order structure of the two multidimensional perfectionism scales. The model used in the second order CFA consisted of adaptive dimensions of perfectionism versus maladaptive dimensions of perfectionism, and it was found to be a good fit for the data. One notable difference within this study from previous studies is that they were able to establish the structure with short-versions of each of the scales, in addition to excluding the other-oriented perfectionism sub-scale from the MPS. Overall, the results from the factor analytic research suggests that multidimensional perfectionism is conceptualised by a higher-order, two-factor model of perfectionism involving one dimension that includes positive or healthy aspects and one dimension that includes negative or unhealthy aspects (Cox et al.,2002; Frost et al., 1990; Stumpf & Parker, 2000).

These two higher-order dimensions of perfectionism have been called or referred to by several different names. This includes adaptive and maladaptive perfectionism (Bieling, Israeli, & Antony, 2004; Chang, Watkins, & Banks, 2004; Cox et al., 2002; Enns, Cox, & Borger, 2001; Suddarth & Slaney, 2001), healthy and unhealthy perfectionism (Stumpf & Parker, 2000), positive strivings and maladaptive evaluation concerns (Frost et al., 1993), healthy and dysfunctional perfectionism (Parker & Stumpf, 1995), personal standards perfectionism and evaluative concerns perfectionism (Dunkley, Blankstein, Halsall, Williams, &

Winkworth, 2000), personal standards and self-critical perfectionism (Dunkley, Zuroff, & Blankstein, 2003), conscientious and self-evaluative perfectionism (Hill, Huelsman, Furr, Kibler, Vicente, & Kennedy, 2004), active and passive perfectionism (Lynd-Stevenson & Hearne, 1999), perfectionistic strivings and perfectionistic concerns (Stoeber & Gaudreau, 2017), and more recently excellence-seeking and failure-avoiding perfectionism (Harari et al., 2018). For the purpose of this thesis the two higher order dimensions will be referred to as perfectionistic concerns and perfectionistic strivings.

Perfectionistic Concerns and Perfectionistic Strivings

The perfectionistic concerns dimension contains facets that are typically considered to be neurotic or damaging to the individual. The facets of perfectionism that are typically grouped under the term 'maladaptive' perfectionism includes discrepancy, socially prescribed perfectionism, concerns over mistakes, doubts about actions, parental expectations, and parental concerns. Each of these facets of perfectionistic concerns share an obsessive concern of possible failure and a revulsion to the thought of imperfection (Enns & Cox, 2002; Harari et al., 2018; Terry-Short, Owens, Slade, & Dewey, 1995). Those with high levels of perfectionistic concerns believe that others expect flawlessness from them and believe that any error, mistake, flaw, or shortcoming will result is others belittling or rejecting them (Bieling, Israeli, & Antony, 2004; Hewitt & Flett, 1991b). These individuals with high perfectionistic concerns are convinced that not meeting a perfect standard will result in detrimental and catastrophic consequences. However, they also believe that meeting this perfect standard would only provide momentary relief (Shafran, Cooper, & Fairburn, 2002). Unsurprisingly, perfectionistic concerns have been found to be associated with higher levels of fear, depression, stress,

anxiety, and burnout (Moate, Gnilka, West, & Bruns, 2016; Stoeber, Edbrooke-Childs, & Damian, 2016; Stoeber & Rennert, 2008), in addition to lower levels of self and life satisfaction (Flett & Hewitt, 2006).

On the other hand, the perfectionistic strivings dimension is comprised of facets that are typically considered normal or even healthy. The facets of perfectionism that are typically grouped under 'adaptive' perfectionism includes high personal standards, order, organisation, self-oriented perfectionism, and other-oriented perfectionism. Each of these facets share the tendency to single-mindedly focus on and insist upon achieving extremely high standards (Dunkley, Blankstein, & Berg, 2012). Those with high levels of perfectionistic strivings force themselves to live up to these standards of excellence and are reluctant or unwilling to modify or reduce these high standards, even when doing 'good enough' would suffice (Shafran, Cooper, & Fairburn, 2002; Sherry, Hewitt, Sherry, Flett, & Graham, 2010). If their self-imposed high standards are not met, then they typically experience a decrease in their perception of their own self-worth (Greenspon, 2000; Lundh, 2004). However, if they meet their self-imposed high standards, then they readjust and set even higher standards for their future performance expectations, rather than experiencing any pride or self-satisfaction (Flett & Hewitt, 2006). Perfectionistic strivings have been found to be associated with positive outcomes, such as higher levels of self-confidence, conscientiousness, achievement motivation, and sustained goal-directed behaviour (Moate et al., 2016; Stoeber & Rennert, 2008). Although, research has also found perfectionistic strivings to be neutral or even problematic (see Bielings, Israeli, & Antony, 2004; Dunkley et al., 2000; Enns, Cox, & Borger, 2001; Stoeber & Otto, 2006).

Various researchers have suggested that some forms of perfectionism,

particularly perfectionistic strivings, may be healthy or adaptive, while others have strongly challenged this, spawning a lively debate on the adaptiveness or mal-adaptiveness of perfectionism (Moate et al, 2016; Stoeber, 2012; Stoeber & Otto, 2006). While the mal-adaptiveness and unhelpful nature of the perfectionistic concerns dimension, in regards to their individual health and wellbeing, is uncontested; the (mal)adaptiveness of the perfectionistic strivings dimension remains unclear and is where most of the debate lies. Ultimately, researchers question whether having an impulsive need to strive for perfection is actually adaptive (Flett & Hewitt, 2006). Those that argue that perfectionistic strivings are positive cite findings that show it to be related to higher levels of endurance, greater subjective wellbeing, and higher levels of extraversion and conscientiousness (Stoeber & Otto, 2006). Alternatively, perfectionistic strivings have also been found to be related to higher levels of perceived stress and pathological symptoms, lower levels of perceived social support, lower levels of external locus of control, attachment avoidance and anxiety, as well as suicidal ideation (Levenson, 1981; Stoeber & Otto, 2006). Additionally, findings also show perfectionistic strivings to have mixed results when it comes to higher levels of conscientiousness and neuroticism (Enns, Cox, & Borger, 2001), having higher levels of both positive and negative affect (Bielings, Israeli, & Antony, 2004), and having higher levels of avoidant coping and perceived hassles (Dunkley et al., 2000). While the adaptiveness of any forms of perfectionism is unclear, Castro and Rice (2003) suggest further research for the generalisability of the findings, specifically because most of the research has been done on psychiatric or undergraduate samples, thus little is known about the role of multidimensional perfectionism within general populations or within the workplace (Chang, 2002; Sherry et al., 2010).

Altogether, perfectionism is not a unitary personality trait. Perfectionism encompasses many different aspects or facets that when combined make up the two high-order dimensions of perfectionistic strivings and perfectionistic concerns (Enns & Cox, 2002; Stoeber & Damian, 2016). As mentioned, the two dimensions typically show different, and often opposite, patterns of association with health and wellbeing outcomes (Stoeber & Damian, 2016). However, the perfectionistic strivings and concerns can also show large positive correlations with each other (Stoeber & Gaudreau, 2017). This indicates that those who have higher levels of perfectionistic strivings also have higher levels of perfectionistic concerns, and vice versa. This overlap between the two higher-order dimensions allows researchers to 'partial out,' or control for, one dimension whilst exploring the effects of the other dimension. Previous research has argued that when the negative aspects of perfectionistic concerns are suppressed, perfectionistic strivings are associated with more positive outcomes (Hill, 2014; 2017; Stoeber & Damian, 2016). Although, according to Stoeber and Gaudreau (2017), partialling is vital when attempting to understand the shared, unique, combined, and interactive relationships between the two dimensions of perfectionism.

Within-Person Combinations of Perfectionistic Concerns and Strivings.

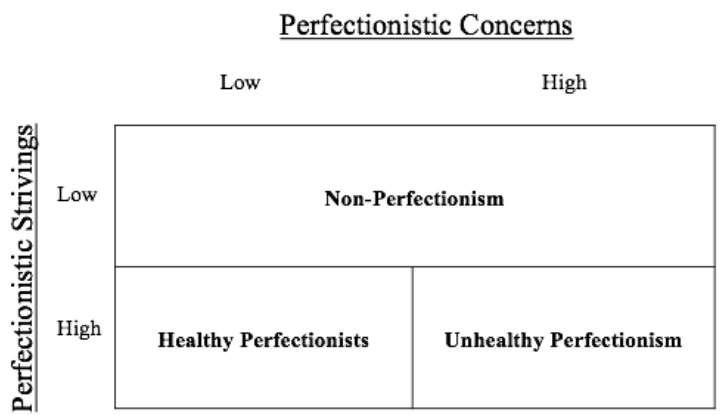
The overlap between perfectionistic concerns and strivings has lead researchers to investigate the interactive effects of multidimensional perfectionism. Researchers have hypothesised that everyone possesses both dimensions of perfectionism, just with varying levels of perfectionistic strivings and concerns (Gaudreau & Thompson, 2010; Rice & Ashby, 2007). The two dimensions have traditionally been researched as continuous variables, which explores the between-person differences of perfectionistic concerns and perfectionistic strivings against

various health and wellbeing indicators. Though, recently there has been a growing interest into the shared variance between the two dimensions, and attention is being brought to the within-person combinations of perfectionistic strivings and concerns (Gaudreau & Thompson, 2010; Rice & Ashby, 2007). In an attempt to understand how perfectionistic strivings and concerns are organised within-individuals, researchers have begun investigating the differences between 'subtypes' of perfectionism (e.g., Parker, 1997; Rice & Ashby, 2007; Rice & Slaney, 2002). In doing so, the interaction between perfectionistic strivings and concerns becomes the focus rather than the two dimensions themselves (Gaudreau & Thompson, 2010).

Two models have developed from exploring the within-person combinations of perfectionistic strivings and concerns. The first model is the tripartite model, which was developed by Parker (1997), and was the first to explore subtypes of perfectionists. Their model included healthy perfectionists, dysfunctional perfectionists, and non-perfectionists (Parker, 1997). Then, Rice and Ashby's (2007) tripartite model continued this research and is now the most recognised tripartite model which includes adaptive (or healthy) perfectionists, maladaptive (or unhealthy) perfectionists, and non-perfectionists. Adaptive perfectionists include those that are low in perfectionistic concerns and high in perfectionistic strivings. Maladaptive perfectionists include those that are high in perfectionistic concerns and high in perfectionistic strivings. Lastly, non-perfectionists include those that are low in perfectionistic strivings, regardless of levels of perfectionistic concerns (Rice & Ashby, 2007; Stoeber & Otto, 2006).

The second model, which builds on the tripartite model, is the 2x2 model of perfectionism. Gaudreau and Thompson (2010) saw the need to include subtypes that differentiate those that are low in perfectionistic strivings, but are either high or

low in perfectionistic concerns. This proposed a quadripartite model of perfectionism, rather than a tripartite model of perfectionism. Their new conceptualisation of the within-person combinations of perfectionism is referred to as the 2x2 model of perfectionism (Gaudreau & Thompson, 2010). Their model contains four subtypes of perfectionism with corresponding levels of both perfectionistic concerns and strivings. Specifically, the model includes pure perfectionistic strivings (Pure PS), which are those that have high perfectionistic strivings and low perfectionistic concerns. Then, there are pure perfectionistic concerns (Pure PC), which includes those with low perfectionistic strivings and high perfectionistic concerns. Then, there are mixed perfectionists which have high perfectionistic strivings and high perfectionistic concerns. Lastly, there are non-perfectionists, who have low perfectionistic strivings and low perfectionistic concerns (Gaudreau & Thompson, 2010). Figure A visually represents the two models of within-person combination of perfectionism.



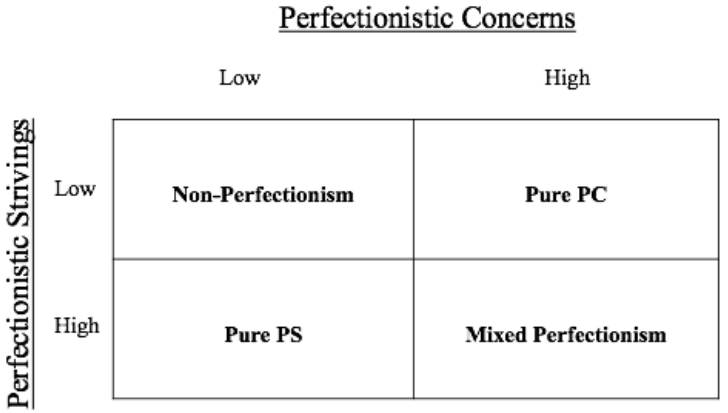


Figure A: Rice and Ashby's (2007) Tripartite Model of Perfectionism and Gaudreau and Thompson's (2010) 2x2 Model of Perfectionism (adapted from Douilliez & Lefevre, 2011).

One key difference between the tripartite and the 2x2 model of perfectionism is which subtype they hypothesise would be the most maladaptive. The 2x2 model hypothesises that the most maladaptive subtype is Pure PC, those with high perfectionistic concerns and low perfectionistic strivings. The tripartite model hypothesised that their maladaptive perfectionism, those with high perfectionistic concerns and high perfectionist strivings, would be the most maladaptive. The maladaptive perfectionism subtype in the tripartite model has the same parameters as the mixed perfectionism subtype within the 2x2 model, in that both have high levels of both perfectionistic strivings and concern (Stoeber, 2012). However, the 2x2 model hypothesises that the high perfectionistic strivings within mixed perfectionism should 'buffer' or counteract some of the impact of the high perfectionistic concerns. Therefore, that subtype would not be the most maladaptive because the Pure PC subtype has low perfectionistic strivings, which would not allow for any buffering effects (Gaudreau & Verner-Filion, 2012).

Another key difference between the tripartite and the 2x2 model of perfectionism is the distinction between Pure PC and non-perfectionism in the 2x2 model. The tripartite model's non-perfectionism is characterised by low levels of perfectionistic strivings, regardless of levels of perfectionistic concerns. The distinction between those that have low perfectionistic strivings and high perfectionistic concerns (Pure PC) and those that have low perfectionistic strivings and low perfectionistic concerns (non-perfectionists) has been shown to have some support from preliminary evidence (see Franche, Gaudreau, & Miranda, 2012; Gaudreau & Thompson, 2010; Li, Hou, Chi, Liu, & Hager, 2014; Sironic & Reeve, 2012).

Within the 2x2 model's conceptualisation, four hypotheses were proposed

by Gaudreau and Thompson (2010) for further empirical and theoretical development of the model. Hypothesis 1 in the 2x2 model of perfectionism directly compares the possible adaptiveness of Pure PS and non-perfectionists. Hypothesis 1a predicts Pure PS as being the most adaptive subtype, whereas hypothesis 1b favours non-perfectionists as the most adaptive, and finally hypothesis 1c claims that there is no difference between the two subtypes. Hypothesis 2 in the model supports the notion that Pure PC is less adaptive than non-perfectionists. Hypothesis 3 in the model suggested that mixed perfectionists would be more adaptive than Pure PC. Lastly, hypothesis 4 in the model suggests that mixed perfectionists are less adaptive than Pure PS. The hypotheses, as a whole, make an effort to order the subtypes of perfectionism from the most to least adaptive when being explored against health and wellbeing outcomes.

With the use of these hypotheses, research has begun to provide insight into the different subtypes of perfectionism and the relationship to wellbeing measures (Franche, Gaudreau, & Miranda, 2012). While being compared to non-perfectionists, Pure PS has been associated with higher levels of positive wellbeing measures, such as satisfaction and positive affect (Cumming & Duda, 2012; Gaudreau & Thompson, 2010), while also having less depressive symptoms (Douilliez & Lefevre, 2011); supporting the 2x2 model's hypothesis 1a. However, Pure PS and non-perfectionists have also been found to have no difference, specifically in levels of negative affect and wellbeing (supporting hypothesis 1c; Gaudreau & Verner-Filion, 2012). Pure PC has been found to be the most maladaptive subtype, having been found to have the lowest levels of psychological adjustment, including the lowest levels of positive affectivity, satisfaction, and wellbeing (supporting hypotheses 2 and 3). Whereas, mixed perfectionists have been

found to have lower levels of positive affectivity and satisfaction compared to Pure PS (supporting hypothesis 4). However, mixed perfectionists have also been found to have similar levels of wellbeing and depressive symptom as Pure PC (Gaudreau & Verner-Filion, 2012).

In a review by Ingles and colleagues (2016), they highlight the varying populations that researchers have begun to explore using the subtypes of perfectionism. This includes research into university students and adolescents (see Crocker, Gaudreau, Mosewich, & Kljajic, 2014; Damian, Stoeber, Negru, & Băban, 2014; Franche, Gaudreau, & Miranda, 2012; Gaudreau & Thompson, 2010; Speirs Neumeister, Fletcher, & Burney, 2015) as well as athletes, coaches, and dancers (Cumming & Duda, 2012; Gaudreau & Verner-Filion, 2012; Hill & Davis, 2014). However, there is little known about the subtypes of perfectionism within the context of the workplace. In the only investigation into the 2x2 model in a working population, Li and colleagues (2014) investigated the relationship between subtypes of perfectionism, coping styles, and burnout among IT workers in China. It was found that Pure PS and non-perfectionists had significantly lower levels of burnout than mixed perfectionists and Pure PC, supporting hypothesis 1a, 2, and 4 of Gaudreau and Thompson's (2010) 2x2 model of perfectionism hypotheses. These results indicate the higher levels of perfectionistic concerns, both in mixed perfectionism and Pure PC, were linked to higher levels of burnout within the sample of workers (Li et al., 2014).

Multidimensional Perfectionism in the Workplace

Most of the literature on perfectionism has focused on students, athletes, and clinical populations, with relatively little attention placed on perfectionism in the workplace (Stoeber & Damian, 2016). Previous research has raised concerns about

the consequences of relying on student populations in psychology research (Rosenberg, 1969; Barr & Hitt, 1986) and found that students are likely to produce more homogenous response data than nonstudent populations (Peterson, 2001). Specifically, within the field of organisational psychology, Barr and Hitt (1986) found significant differences between students and managers in a selection task. Therefore, attempting to generalise results from student populations to a working population could be problematic. Additionally, perfectionism has been found to be highly prevalent within the workplace, with 53-58% of employees stating they have perfectionistic tendencies at work (Childs & Stoeber, 2012). Moreover, organisations have a tendency to value perfectionism as an asset within the workplace (Ozbilir, Day, & Catano, 2014; Stoeber & Damien, 2016), even though the relationship between perfectionism and work-related variables is still unclear (Harari et al., 2018).

The want for flawlessness in one's high standards and performance within their work can create considerable demands that affects various mental wellbeing indicators (Bakker & Demerouti, 2007; Schwenke, Ashby, & Gnilka, 2014). Higher stress levels are anticipated in employees higher in perfectionism, because of the perfectionistic tendencies to doubt the quality of their work and their reduced ability to adaptively cope with work hassles (Dunkley, Zuroff, & Blankstein, 2003; Stoeber & Otto, 2006). Research has shown that perfectionistic workers experience higher levels of anxiety and prolonged activation from a strain, because they are continually working for and worrying about their performance (Kawamura, Hunt, Frost, & DiBartolo, 2001). Additionally, perfectionists often feel as though they have not met their high standards, which when reoccurring and if left untreated can lead to depression (Flett, Besser, Davis, & Hewitt, 2003). These relationships are

expected to be more pronounced for employees higher in perfectionistic concerns, than with those higher in perfectionistic strivings. Particularly because those higher in perfectionistic concerns have tendencies to obsess about any mistakes they have made, doubt their performance, and worry about disappointing or being rejected by others (Stoeber & Rennert, 2008).

There has been some empirical research into the ways in which perfectionistic employees work, particularly how engaged they may be in their work and whether they have workaholic tendencies. In examining engagement with work, perfectionistic strivings have been found to be positively related with three aspects of work engagement: vigour, dedication, and absorption (Childs & Stoeber, 2010; Tziner & Tanami, 2013). Whereas, perfectionistic concerns have been found to have no relationship with work engagement (Tziner & Tanami, 2013; Wojdylo, Baumann, Buczny, Owens, & Kuhl; 2013) or have been found to be negatively related to work engagement (Ozbilir, Day, & Catano, 2014). These findings could suggest that those with higher perfectionistic strivings have more adaptive relationships with their work, which those higher in perfectionistic concerns may not have. Alternatively, both perfectionistic strivings and perfectionistic concerns have been shown to be positively correlated with workaholism (Clark, Lelchook, & Taylor, 2010; Taris, van Beek, & Schaufeli, 2010; Tziner & Tanami, 2013). Further study into potential mechanisms that explain this relationship found that employees' self-regulated motivation mediated the relationship between perfectionistic strivings and workaholism (Stoeber, Davis, & Townley, 2013). With workaholism also being associated with increased levels of burnout and low levels life satisfaction (Clark, Michel, Zhdanova, Pui, & Baltes, 2016), the adaptiveness of perfectionistic strivings is still unclear.

When exploring perfectionism's link to wellbeing in the workplace, empirical research has focus on investigating the relationship between perfectionism and burnout. Research has found that only perfectionistic concerns is associated with burnout, and not perfectionistic strivings (Fairlie & Flett, 2003; Kazemi & Ziaaddini, 2014; Mitchelson & Burns, 1998; Van Yperen, Verbraak, & Spoor, 2011). While exploring the within-person subtypes of perfectionism, Li, Hou, Chi, Liu and Hager (2014) found that subtypes high in perfectionistic concerns (Pure PC and mixed perfectionists) had significantly higher levels of burnout than the subtypes low in perfectionistic concerns (non-perfectionists and Pure PS). In a meta-analysis exploring perfectionism and burnout, it was found that perfectionistic strivings have small negative or non-significant relationships to burnout, where perfectionistic concerns show medium-to-large positive relationships to burnout (Hill & Curran, 2016). These studies appear to show the detrimental impact of perfectionistic concerns on employees' work-related wellbeing, and a neutral or potentially positive effect of perfectionistic strivings on employees' work-related wellbeing.

Lastly, in a recent meta-analysis, Harari, Swider, Steed, and Breidenthal (2018) explored perfectionism in the workplace and asked the question 'Is perfect good?' Based on their empirical review of perfectionism research, their answer was that perfectionism is likely not constructive within the workplace. They go on to explain that the consequences of high levels of perfectionism, especially perfectionistic concerns, outweighed any benefits to employees. They argue that the few correlates that link perfectionistic employees to favourable outcomes, such as motivation and engagement, do not counteract the negative relationships between perfectionism and mental wellbeing indicators. Practically, they recommend

perfectionistic employees to engage in helpful practices, such as healthy recovery activities to combat or mitigate the negative impact their perfectionism has on their wellbeing. Additionally, they advise managers and organisations to not monitor perfectionistic employees closely, but to encourage them to not overinvest in their work (Harari et al., 2018)

The Diathesis-Stress Hypothesis

Perfectionism can present itself in many areas of life. However, within the workplace there are specific stressors, such as achievement-oriented expectations, that might activate or enhance perfectionistic beliefs and behaviours within employees. There is a growing interest within perfectionism research, particularly when researching perfectionism's influence on employees' wellbeing, to investigate whether perfectionism is only active during working periods. This will directly test whether perfectionism is only activated when work-related stressors are present, as opposed to periods away from work when stressors are not readily available (Flaxman, Menard, Bond, & Kinman, 2012). That is to say, it has been hypothesised that perfectionism's interaction with stressors may suggest it functions as a diathesis (Flett, Hewitt, Blankstein, & Mosher, 1995). The diathesis-stress model of perfectionism outlines that the relationship between perfectionism and stress can manifest in many ways, including stress anticipation, stress generation, stress perpetuation, and stress reactivity (Hewitt & Flett, 2002).

The perfectionism diathesis-stress model suggests that perfectionism will interact with work-related stressors to produce negative outcomes for individuals (Enns, Cox, & Clara, 2005). The model proposes that an individual's psychological symptoms or behaviours are a result of an interaction between an internal vulnerability and an active stress in the environment (Zuckerman, 1999). Therefore,

this model can aid in the understanding as to why work can be such a problematic environment for workers with perfectionistic tendencies, specifically those with higher levels of perfectionistic concerns. The diathesis-stress model was developed from the congruency model, which posits that stressors are more likely to produce negative outcomes for individuals if they pose a particular threat to a central aspect of the self (Hewitt & Flett, 1993; Oatley & Bolton; 1985). In other words, if the environmental stress is congruent with the corresponding dimensions of perfectionism, the stress is enhanced or more impactful (Blankstein, Lumley, & Crawford, 2007; Chang & Rand, 2000). For example, the achievement-stress present within the workplace, whether it be inter- or intra- personal, would interact with perfectionistic concerns and strivings to cause a stress reaction or predict distress. Thus, without the presence of active work-related stressors during non-working periods, the negative impact of perfectionism should remain dormant or benign (Flaxman et al., 2012).

Perfectionism and Recovering from Workplace Stress

As mentioned in Chapter 1, research has found that recovering from work-related stress during non-working periods is an important mechanism for maintaining employees' mental and physical wellbeing. From a diathesis-stress prospective, research on perfectionism's link to employees' wellbeing and recovery has begun investigating whether perfectionism is only activated during working periods, but remains dormant during non-working periods. At present, there has only been one study that has explored the diathesis-stress hypothesis within a working population. The aim of the research was to explore maladaptive perfectionism and employees' experience of a vacation from work (see Flaxman et al., 2012). Flaxman and colleagues (2012) investigated a sample of academics using the Frost et al.

(1990) ‘doubts about actions’ measure to examine one aspect of perfectionistic concerns. They explored the impact maladaptive perfectionism had on employees’ wellbeing before, during, and after an Easter vacation. Their findings revealed that during the vacation, there was no difference in the level of wellbeing between the perfectionists and non-perfectionists. However, once returning to work, those with higher levels of perfectionism had lower levels of wellbeing (Flaxman et al., 2012). This suggests that during the Easter break, without the presence of work-related stressors, perfectionism was not activated to produce poor wellbeing. However, when work resumed and stressors returned, perfectionism was reactivated, which in return impacted the maladaptive perfectionists’ wellbeing. These findings also highlight the importance of a vacation for perfectionists, because it allowed them to experience a break from their typical day-to-day stressors that activate their perfectionism.

Vacations offer longer elevations from work-related stress and more complete recovery can be experienced, however daily recovery from work-related stress is crucial for health and wellbeing (Sonnentag, Binnewies, & Mojza, 2010; Trougakos, Beal, Green, & Weiss, 2008). Therefore, it is also important to examine perfectionism’s influence on daily recovery. In the evening after work, without the presence of work-related stressors, perfectionism should, in theory, also remain dormant. However, researchers have found that those with high perfectionistic concerns have a tendency to worry and ruminate in the evening after work (Flaxman, Stride, Soderberg, Lloyd, Guenole, & Bond, 2018). Worrying about an upcoming stress or ruminating about a past stress will function as a stressor during the evening, even if the stressor is not actually present at that time, which then reactivates or prolongs the stress activation.

Individual differences in physiological stress reactivity are considered to contribute to a range of somatic disorders and illnesses. Stressors that activate the sympathetic nervous system more intensely and for longer durations can amplify the detrimental effects of the physiological stress response. There is yet to be any research that directly explores perfectionism's physical reaction to work-related stress. However, a recent lab-based study, conducted by Azam and colleagues (2015), examined maladaptive perfectionism and heart rate variability (HRV) as a measure of psychophysiological activation during and after a stressor. They also tested perfectionistic concern's relationship to worry and rumination, because they have been suggested to impact HRV and health outcomes (Brosschot, Gerin, & Thayer, 2006). They found that being a maladaptive perfectionist was related to greater levels of worry and rumination, and were found to not relax or recover compared to a control group. Scores of HRV were enhanced, which is a sign of healthy functioning, for the control group following a mindfulness mediation, but HRV scores remained in a stress-activation state for maladaptive perfectionists (Azam et al., 2015). These findings suggest that psychophysiological stress activation remains active for prolonged periods of time for perfectionists. This could be due to perfectionist's tendency to worry and ruminate about stressors.

The Perfectionism Cognitive Theory

While the (mal)adaptiveness of multidimensional perfectionism continues to be explored, researchers have also begun to uncover cognitive mechanisms and behaviours that aid in explaining the link between perfectionism and psychological health outcomes. The perfectionism cognition theory, developed by Flett, Nepon, and Hewitt (2016), was developed to be the theoretical framework for the underlying cognitive mechanisms, processes, and outcomes that are associated with

multidimensional perfectionism. Specifically, the theory outlines cognitive perseveration, in the form of worry and rumination, as being central to the link between perfectionism and wellbeing, due to perfectionists' obsessive need for flawlessness (Xie, Kong, Yang, & Chen, 2019).

The perfectionism cognitive theory emphasises that worry and rumination are comparable forms of cognitive perseveration that prolong the activation of emotional and physical distress within perfectionists (Flett, Nepon, & Hewitt, 2016). These two forms of cognitive perseveration activate and enhance a self-focused nervousness about being imperfect, whether it involves ruminating about a past mistake or failure, or worrying about future mistakes or failures. Within the perfectionism cognition theory, there are three central themes outlined for the connection between multidimensional perfectionism and worry and rumination. First, the theory suggests that both perfectionistic concerns and perfectionistic strivings are associated with worry and rumination. Second, perfectionists experience several different forms of cognitive perseveration that are core to their perfectionistic cognitions. Third, from a diathesis-stress perspective, worrying and ruminating is linked to emotional and physical health problems (Flett, Nepon, & Hewitt, 2016).

The perfectionism cognition theory suggests that worry and rumination mediates the relationship between both perfectionism dimensions and health outcomes. Previous research has found that perfectionistic concerns have been linked to worry and rumination during a vacation period, which was found to cause greater deterioration in wellbeing (Flaxman et al., 2012). Additionally, perfectionistic concerns have also been associated with poorer day-to-day work functioning and sleep quality via their tendency to worry and ruminate about work

in the evening. Perfectionistic strivings were associated with work day engagement due to their tendency to think positively about work during non-working periods, and were not uniquely related to worry and rumination (Flaxman et al., 2018). The evidence seems to support worry and rumination as underlying mechanisms for perfectionistic concerns, however it remains unclear whether worry and rumination function in the same way for perfectionistic strivings.

Thesis Outline of Empirical Research

This thesis includes three empirical studies that were designed to investigate the relationship between multidimensional perfectionism and recovering from work-related stress. The first study examines the relationship between perfectionistic strivings and concerns and school teachers' rates of vacation recovery and vacation fade out over a week-long half-term break. This study is particularly interested in exploring whether multidimensional perfectionism is a personality disposition that helps or hurts the school teachers' recovery and fade out over the vacation period. A sample of 280 school teachers from the United Kingdom and the United States filled in measures of burnout and affective wellbeing on two occasions before the half-term, at one point during the half-term, and for four consecutive weeks following the half-term.

The second study examines the within-person combination of multidimensional perfectionism and their relationship to school teachers' wellbeing during a working week and during a vacation week. The first aim of this research was to determine whether the tripartite model of perfectionism or the 2x2 model of perfectionism were a better fit for the within-person combinations of perfectionism. The next aim was to explore how being a member of each subtypes impacts school teachers' wellbeing, in the form of work-related burnout and context-free positive

and negative affect.

Lastly, the third study will examine the association between multidimensional perfectionism and psychophysiological recovery in the evening after the working day and during sleep. Specifically, measures of both objective wellbeing, in the form of evening HRV and nocturnal HRV, and subjective wellbeing, in the form of positive and negative affect and subjective sleep quality. The main aim of the research is to test whether worrying and ruminating in the evening moderate the relationships between perfectionistic strivings and perfectionistic concerns with the evening wellbeing measures, thus impeding their recovery experiences. A sample of 51 employees wore a heart-rate monitor for roughly 36 hours, which included two evenings and two sleeping periods.

Chapter 3: Employee perfectionism during a vacation: Exploring the relationship between multidimensional perfectionism and school teachers' wellbeing over a half-term break

Introduction

Recovering from workplace stress during non-working periods has been widely accepted as an important factor for maintaining employees' mental and physical health. Recovery has been suggested to occur during varying lengths of non-work periods, including evenings, weekends, and longer vacation periods. However, it has been shown that employees do not experience full recovery during the evening after the workday or during the weekend alone (de Bloom et al., 2010). Thus, the longer respite from work-duties during a vacation period has been shown to be more beneficial for employees (Hächler, Pereira, & Achim, 2017). Research into vacation periods has become a topic of interest within occupational psychology, and related fields, since it offers an ideal opportunity to replenish resources lost on the job. Especially since findings in a longitudinal study by Gump and Matthews (2000) revealed that not taking annual vacations was associated with illness and even premature death. Taking annual vacations reduces and even prevents ailments associated with employees being over-exposed to job stress (Kühnel & Sonnentag, 2011). Although, despite the fact that vacations offer a time for employees to recover, the positive benefits gained during a vacation begin to fade out when employees return to work (de Bloom et al., 2009). There has been some investigation into how quickly post-vacation levels of wellbeing reach pre-vacation levels of wellbeing, but there lacks exploration into *the rate* at which employees recover during a vacation period and *the rate* at which vacation benefits fade out.

Most vacation research has explored how employees generally experience a

vacation period, but more recently, researchers have begun to investigate whether experiences of a vacation vary amongst individuals. De Bloom and colleagues (2011) looked at whether favourable vacation effects applied to all employees. It was found that only 60% of their sample had improvements over the vacation, with 23% having no improvements and 17% having had negative effects from the vacation (de Bloom et al., 2011). This suggests that there were differences when it came to individuals' experiences of a vacation, leading researchers to suggest the investigation of specific individual differences that may be playing part in one's ability to recover and how quickly vacation effects fade out (de Bloom, Geurts, & Kompier, 2012; de Bloom, Geurts, & Kompier, 2013). A handful of studies have looked at different types of workers and how they recover, including workaholics (see Bakker, Demerouti, Oerlemans, & Sonnentag, 2013; Snir & Zohar, 2008; Van Wijhe, Peeters, Schaufeli, & Ouweneel, 2013), obsessive workers (de Bloom, Radstaak, & Geurts, 2014), and perfectionists (Flaxman et al., 2012; 2018). The findings from these studies showed that these workers had a different unwinding process compared to their counterparts. While exploring personality traits has been suggested as a possible influence on vacation experiences, there has been little attention paid to this area within the vacation literature.

To advance the field, the present research will investigate the rate of recovery and the rate of fade out in school teachers' wellbeing over seven weeks which includes a week-long half-term vacation. The rate of change over the seven repeated measures will be explored using multilevel growth curve modelling, which will allow for an exploration into the shape and trajectory of wellbeing levels over the course of the research period. To further the understanding of individual factors contributing to vacation experiences and expand on previous research into

perfectionism, this current research will explore whether perfectionism is a personality dimension that impacts one's vacation effects. Specifically, this research will investigate whether different dimensions of perfectionism may aid or hinder individuals' rates of recovery and fade out over the vacation period.

Theories Underpinning Vacation Research

A vacation is defined as a planned respite from work when an employee is not actively participating in their job, and typically ranges from 1 to 3 weeks in duration (Lounsbury & Hoopes, 1986; Strauss-Blasche et al., 2004). Vacations offer a removal from normal day-to-day job demands, which in turn replenishes resources and allows psychophysiological systems to return to baseline levels; this process is known as recovery (Kühnel & Sonnentag, 2011). Previous research advocates the use of Hobfoll's (1989) conservation of resources theory when exploring a vacation period (Westman & Eden, 1997; Westman & Etzion, 2001). This theory of stress cycles, indicates that vacations are a time to halt cycles of resource loss, replenish personal resources, and aid in preventing future job strain (Westman & Etzion, 2001). Similarly, the Effort-Recovery (Meijman & Mulder, 1998) and the Allostatic Load Theories (McEwen, 1998) describe that the normal load reactions accompanying effort at work, can be alleviated during off-job time. If recovery is incomplete, it can lead to more chronic load reactions, such as burnout. Thus, vacations offer an optimal period for replenishing their resources to ensure renewed energy when returning to work (de Bloom et al., 2012; 2014).

Additionally, recovery has been found to be an essential mechanism to protect and enhance wellbeing and performance capabilities, even under high-pressure job demands (de Bloom et al., 2009; 2010; Sonnentag & Fritz, 2015). If recovery does not occur, the psychophysiological systems remain activated for

a prolonged period, leading to continued exposure to stressors, which weakens mental and physical health (de Bloom et al., 2012: Flaxman et al., 2012). Vacations offer long and relatively uninterrupted respite durations, which encourages psychological detachment from work-related demands. Thus, vacations are likely to lead to fuller recovery than typical evenings and weekends; this is often called 'the vacation effect' (de Bloom et al., 2009; 2011; 2012).

Vacation Recovery: Previous Findings. Previous vacation researchers have tested whether employees are alleviated from work-related health risk factors (Westman & Eden, 1997), while others have looked at more general wellbeing (de Bloom et al., 2009; 2010; 2011; Syrek, Weigelt, Kühnel, & de Bloom, 2018). Ultimately, findings suggest that vacations enhance employees' *general* wellbeing and *work-related* measures of wellbeing; but, there lacks exploration into whether patterns of recovery and fade out over a vacation are similar for both employees' work-related and general wellbeing (see Flaxman et al., 2012).

Consequently, this current research will continue to extend previous vacation research by including measures of both work-related and general wellbeing. First, measures of both emotional exhaustion and cynicism will be evaluated to capture two dimensions of burnout. Burnout is defined as a psychological syndrome which involves a prolonged response to occupational stress (Maslach & Jackson, 1984; Maslach, Schaufeli, & Leiter, 2001). Emotional exhaustion is characterised by a perception that one's resources have been depleted and a lack of energy occurs, whereas cynicism (also known as depersonalisation) is often viewed as a coping mechanism which involves distancing oneself and becoming cold to others at work (Alarcon, Eschleman, & Bowling, 2009). Second, measures of both anxious and depressed affect will be evaluated to capture two dimensions of negative affect,

which will explore context-free general wellbeing over the vacation period. The theoretical framework of general affective wellbeing classifies emotions as either positive or negative, as well as high or low activated (Mäkikangas, Feldt, & Kinnunen, 2007). This research will investigate both high activated (anxious) and low activated (depressed) negative affect.

In line with previous research, it is expected that improvements in these measures of wellbeing during the vacation will be seen. Although, previous approaches to calculating recovery were to compare pre-vacation levels to during-vacation levels of wellbeing; thus, the rate at which employees recover is still unclear. This current research will be the first to explore teachers' rate of recovery going into a half-term break.

*Hypothesis 1***:** Teachers will experience recovery during the week-long vacation, indicated by a negative rate of change in emotional exhaustion, cynicism, anxious affect and depressed affect going into the half-term break.

Vacation Fade out: Previous Findings. Without the impact of job-related stress on employees during a vacation period, there is typically an improvement to employees' mental and physical health. Unfortunately, a vacation does not buffer the effects of job stress once returning to work. Specifically, when employees return to work and experience high levels of workload again, the positive vacation effects are rapidly eliminated (Strauss-Blasche, Ekmekcioglu, & Marktl, 2002; Strauss-Blasche et al., 2004). Employees are re-introduced to their typical work routine and life demands, leading to the decline of vacation effects. This begins the 'fade out' of the benefits gained during the vacation. A meta-analysis exploring the fade out of vacation effects found that employees return to pre-vacation levels between two and four weeks post-vacation (de Bloom et al., 2009). Further research found that the

benefits gained from a vacation faded out completely within one week (de Bloom et al., 2010) and even within three days (de Bloom et al., 2012) after the vacation. The varying findings for the full fade out of vacation benefits could suggest that the rate of this fade out may not be a gradual linear fade out, but may grow and vary at differing rates.

Although, the lack of a consensus in how long benefits of a vacation fade out could also be attributed to the fact that studies vary in whether they are looking at week level or day level responses. The results from the citied research rely heavily on the design of each study, specifically the timing and frequency of each repeated measure following the vacation. Additionally, these calculations compared wellbeing levels collected after the vacation to levels before the vacation, to see how long it took for post-vacation levels to return to pre-vacation levels. This technique fails to bring any insight into the rate at which vacation benefits fade out. Research has only started to explore non-linear analyses of vacation fade out (see Syrek et al., 2018), which has begun the investigation into the shape or trajectory of vacation fade out. The current research will investigate the rate and shape of change in employees' wellbeing following a vacation using multilevel growth curve modelling. This analysis will explore whether the rate of change in the fade out of each of the wellbeing measures is linear or curvilinear.

Hypothesis 2: Teachers will experience a fade out of vacation benefits once returning to work, indicated by a positive rate of change in emotional exhaustion, cynicism, anxious affect and depressed affect once work resumes.

Hypothesis 3: The shape of the fade out of emotional exhaustion, cynicism, anxious affect and depressed affect will follow a curvilinear trajectory.

Perfectionism as a Multidimensional Personality Trait

Vacation researchers have begun to explore possible individual differences in the experience of a vacation (see de Bloom et al., 2011). One personality type that has been suggested as a possible predictor for the dissimilarities in the benefits gained from a vacation is multidimensional perfectionism (Flaxman et al., 2012). Perfectionism is defined as the combination of setting extremely high standards for oneself, striving for flawlessness, and the tendency to critically evaluate one's own behaviour (Childs & Stoeber, 2010; Hill & Curran, 2016; Stoeber, Edbrooke-Childs, & Damian, 2016; Stoeber & Rennert, 2008). Today, perfectionism is known to be a multifaceted personality train that contains a variety of components that together describe two higher-order dimensions: *perfectionistic concerns* and *perfectionistic strivings* (Hill & Curran, 2016).

The perfectionistic concerns dimension contains facets that are considered neurotic or damaging to the individual, and has been found to be associated with higher levels of fear, depression, stress, anxiety, and burnout (Moate et al., 2016; Stoeber, Edbrooke-Childs, & Damian, 2016; Stoeber & Rennert, 2008), in addition to lower levels of self and life satisfaction (Flett & Hewitt, 2006). On the other hand, the perfectionistic strivings dimension is comprised of facets that are considered normal or even healthy, and has been linked to higher levels of self-confidence, conscientiousness, achievement motivation, and sustained goal-directed behaviour (Moate et al., 2016; Stoeber & Rennert, 2008). However, the (mal)adaptiveness of the perfectionistic strivings dimension remains unclear due to findings that show it to be neutral or even problematic (see Bielings, Israeli, & Antony, 2004; Dunkley et al., 2000; Enns Cox, & Borger, 2001; Stoeber & Otto, 2006). Furthermore, even though perfectionistic strivings and concerns often show different patterns of

association with wellbeing outcomes, they can also show large positive correlations with each other (Stoeber & Gaudreau, 2017). This would suggest that those who have high levels of perfectionistic strivings also have high levels of perfectionistic concerns.

Perfectionism in the Workplace: Previous Findings. Perfectionism can be found in many areas of life, but has been reported to be the most prevalent within the workplace due to organisational cultures that value perfectionistic behaviours (Ozbilir, Day, & Catano, 2014; Stoeber & Damien, 2016). The concept of perfectionism is familiar to most, although its relationship with work-related variables is unclear because the extant of perfectionism research varies across disciplines (Harari et al., 2018). The few studies that have looked at perfectionism in the workplace found it to be associated with motivation and engagement (Childs & Stoeber, 2010; Harari et al., 2018), burnout (Stoeber & Rennert, 2008), and strain (Mitchelson & Burns, 1998; Ozbilir, Day, & Catano, 2014). A recent meta-analysis investigating perfectionism in the workplace found that the consequences of higher levels of perfectionism, especially perfectionistic concerns, outweighed any benefits to employees (Harari et al., 2018).

The perfectionism cognition theory was developed to investigate the underlying cognitive mechanisms that are associated with multidimensional perfectionism. The theory outlines cognitive perseveration, specifically in the forms of worry and rumination, as being central to the link between perfectionism and negative affect (Flett, Nepon, & Hewitt, 2016). The tendency to worry about future stressors and ruminate about past mistakes is influenced by perfectionists' need for flawlessness in everything they do (Xie et al., 2019). For example, within the workplace this could resemble ruminating about a past criticism from a manager or

colleague, or worrying about upcoming deadlines for a project that has not been perfected just yet.

In a daily survey study conducted by Flaxman and colleagues (2018), perfectionists' perseverative cognition in the evening after work was explored. It was found that perfectionistic concerns were associated with poorer day-to-day work functioning and sleep quality due to the tendency to worry and ruminate about work in the evening. However, perfectionistic strivings were not associated with worry and rumination, but were positively associated with work day engagement due to the tendency to think positively about work during non-working periods (Flaxman et al., 2018). Therefore, evidence seems to support inadequate recovery for those higher in perfectionistic concerns due to the tendency to worry and ruminate during non-working periods. Whereas employees high in perfectionistic strivings appear to recover during non-working periods without these cognitive barriers.

Furthermore, at present there has only been one study that has explored perfectionism and employees' experience of a vacation from work (see Flaxman et al., 2012). Flaxman and colleagues investigated a sample of academics using the Frost et al. (1990) 'doubts about actions' measure to examine one aspect of perfectionistic concerns and the impact it had on employees' wellbeing before, during, and after an Easter vacation. Their findings revealed that during the vacation, there was no difference in the level of wellbeing between the perfectionists and non-perfectionists. However, once returning to work, those with higher levels of perfectionism had lower levels of wellbeing (Flaxman et al., 2012).

To expand on this previous research, the current research will include both a more comprehensive measure of perfectionistic concerns and a measure of perfectionistic strivings, to explore whether perfectionism influences employees'

ability to recover during a vacation and how perfectionism impacts teachers' fade out of vacation benefits. As mentioned previously, this research aims to first explore the general rate of change in both the recovery and fade out of employee wellbeing over a vacation period. Once the general rate of change is determined, this research will examine whether multidimensional perfectionism is associated with differing rates of change in recovery and fade out. Accordingly, it is anticipated that both perfectionistic strivings and perfectionistic concerns will be predictors of the steepness of trajectories for recovery and fade out, indicating more drastic or stable trajectories over the seven weeks.

*Hypothesis 4***:** Perfectionistic concerns will be associated with a less steep rate of recovery of emotional exhaustion (*hypothesis 4a*), cynicism (*hypothesis 4b*), anxious affect (*hypothesis 4c*), and depressed affect (*hypothesis 4d*), indicating less recovery during the respite.

*Hypothesis 5***:** Perfectionistic strivings will be associated with a steeper rate of recovery of emotional exhaustion (*hypothesis 5a*), cynicism (*hypothesis 5b*), anxious affect (*hypothesis 5c*), and depressed affect (*hypothesis 5d*), indicating more recovery during the respite.

*Hypothesis 6***:** Perfectionistic concerns will be associated with a steeper rate of fade out of emotional exhaustion (*hypothesis 6a*), cynicism (*hypothesis 6b*), anxious affect (*hypothesis 6c*), and depressed affect (*hypothesis 6d*), indicating a quicker fade out of vacation effects.

*Hypothesis 7***:** Perfectionistic strivings will be associated with a less steep rate of fade out of emotional exhaustion (*hypothesis 7a*), cynicism (*hypothesis 7b*), anxious affect (*hypothesis 7c*), and depressed affect (*hypothesis 7d*), indicating a slower fade out of vacation effects.

Method

Participants

Participants were teachers, head teachers, and teaching assistants from various schools around the United Kingdom and the United States. An original sample of 176 participants were collected as part of the author's previous MSc dissertation[1]. For the purpose of this thesis, additional participants were recruited for a total of 313 participants who volunteered to take part in this research project. In order to be included in this research, each participant had to complete the initial survey, to ensure there were perfectionism measures for each participant. A total of 280 participants returned this survey, making them eligible to participate. A final total of 1720 weekly surveys were completed. The sample was predominately female (85%) and had an average age of 40.24 (SD = 10.53). The sample had an average tenure of 13.44 (SD = 9.15) years, with 211 (67.37%) being from the United Kingdom, and 69 (32.7%) from the United States.

Design and Procedure

Half-Term Respite Design. A seven-week longitudinal design was implemented which included school teachers' week-long half-term vacation period. The half-term break was chosen because it had two working weeks prior to the break and four consecutive working weeks following the break. Previous research has suggested to measure wellbeing two weeks before a vacation period; as well as include a measurement during the vacation in order to investigate the vacation effect

[1] The author's previous MSc dissertation was conducted at City, University of London under the same supervision as this thesis. The dissertation included a portion of the data which was included in this thesis and explored SOP and SPP on burnout. However, to distinguish the current research from the previous work, additional data were collected, further variables were explored, and more complex analyses were performed.

during work and non-work weeks (de Bloom et al, 2009; 2010; Eden, 2001). Data collection took place over the 2016 and 2017 academic school years, and included both the February and May half-term breaks in the United Kingdom, as well as Presidents' Week and Spring Break in the United States. Teachers were strategically chosen because, unlike other professions, they have a set week-long half-term break. Additionally, the chosen vacation periods occurred at similar times in both regions, which potentially increases the generalisability of study findings.

Procedure. The majority of participants were recruited via a research flyer on the University website, word-of-mouth, and through various social media platforms; which included the Guardian newspaper's teacher network and the Education Support Partnership's websites. Following recruitment, an initial survey was distributed prior to the first weekly survey to record demographic information, as well as the perfectionism measures. The participants were then asked to complete a weekly survey each Friday for seven consecutive weeks. Each survey was sent to participants via Qualtrics, an online survey software. At every occasion, participants were assured that their answers were completely confidential and were asked to complete the survey as soon as possible at the end of the working day.

Initial Measures

Perfectionism. Perfectionism was measured using the short-form Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991b) and the short-form Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990; also see Cox, Enns, & Clara, 2002). The short-form MPS includes five items that measure self-oriented perfectionism (SOP) and five items that measure socially-prescribed perfectionism (SPP). The items were presented on a seven-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). The SOP measurements included

items such as 'I am perfectionistic in setting my goals' and had a Cronbach's alpha of .84. The SPP measurements included items such as 'although they may not show it, other people get very upset with me when I slip up' and had a Cronbach's alpha of .77. The short-form FMPS includes five items that measure concerns over mistakes (CM), three items that measure doubts about actions (DA), and five items that measure personal standards (PS). The items were presented on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The CM measure included items such as 'If I fail at work, I am a failure as a person' and had a Cronbach's alpha of .88. The DA measure included items such as 'I usually have doubts about the simple everyday things I do,' and had a Cronbach's alpha of .73. Lastly, the PS measure included items such as 'I set higher goals for myself than most people' and had a Cronbach's alpha of .83.

Control Variables. Age, gender, neuroticism, and conscientiousness were controlled for within the analyses. Age and gender were asked within the demographic section of the initial survey. Conscientiousness and neuroticism were measured using the 10 item short-version of the Big Five Inventory (Rammstedt & John, 2007). The scale begins with the statement 'I see myself as someone who…' and was measured on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). The neuroticism items included '…gets nervous easily' and '…is relaxed, handles stress well' which was recoded. Cronbach's alpha for neuroticism was .55. The conscientiousness measures included '…does a thorough job' and '…tends to be lazy' which was recoded. Cronbach's alpha for conscientiousness was .55. Cronbach's alpha for each measurement is seemingly low due to the fact that each measure only had two items in this short-version scale. Nevertheless, according to Hinton, Brownlow, McMurray, and Cozen (2004), a Cronbach's alpha

between 0.5 and 0.75 is generally accepted as a moderately reliable scale.

Initial Measurement Testing. In order to measure the two higher-order dimensions of perfectionism, a series of factor analyses were performed. An exploratory factor analysis (EFA) was conducted in order to see how each of the measures loaded freely on a two-factor model; which resulted in the typical split of SPP, CM, and DA loading together as perfectionistic concerns, and SOP loading with PS as perfectionistic strivings. Although, one item of SPP ('my family expects me to be perfect.') loaded with the typical perfectionistic strivings measures. Contextually, this item may not be appropriate for a sample of working adults; thus, this item was dropped. Then, a sequence of confirmatory factor analyses (CFAs) were conducted in order to find the best fit for the perfectionism model. The CFAs tested whether a one or two factor model was more appropriate for the combination of the perfectionism scales. The results found that another SPP item ('People expect nothing less than perfection from me) cross-loaded with perfectionistic strivings, therefore it was dropped. The final model, with perfectionistic strivings and perfectionistic concerns as higher-order dimensions (χ^2 = 430.29, *df*=183, RMSEA = .07, CFI = .91, NNFI = .90), was a better fit than a one factor model of perfectionism ($\Delta\chi^2$ = 132.16, *df* = 1, $p < .001$); which is consistent with previous research (see Cox, Enns, & Clara, 2002).

Some may argue that neuroticism and conscientiousness do not differ greatly from perfectionism; therefore, a series of CFAs was conducted to test whether each measure was a separate personality construct. The results found that a second-order four factor model, which separated perfectionistic strivings, perfectionistic concerns, neuroticism, and conscientiousness (χ^2 = 554.34, *df* = 264, RMSEA = .06, CFI = .90, NNFI = .89), was a better fit than a one, two, or three factor model (see results in the

Appendix). Thus, it was suitable to separate the two dimensions of perfectionism from the two control variables of neuroticism and conscientiousness.

Weekly Measures

Emotional exhaustion and cynicism. Emotional exhaustion and cynicism were measured with five items that were adapted from the exhaustion subscale of the Maslach Burnout Inventory (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996; also see Flaxman et al., 2018). Participants were asked to assess work-induced exhaustion and cynicism over the past week and responses were given on a six-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). The emotional exhaustion measure included items such as 'I felt burned out from my work' and the Cronbach's alpha for each week was .88, .89, .89, .90, .90, .90, and .91. Cynicism was measured with three items and was adapted from the same scale (Schaufeli et al., 1996). The measure included items such as 'I became more cynical about whether my work contributes anything' and the Cronbach's alpha for cynicism each week was .78, .84, .82, .87, .83, .84, and .86.

Anxious and depressed affect. The two measures of negative affect were measured using items from Warr's (1990) Affective Well-Being scales (also see Daniels, Brough, Guppy, Peters-Bean, & Weatherstone, 1997; Mäkikangas, Feldt, & Kinnunen, 2007). Participants were asked over the past week how much they felt each of the emotions and responses were given on a five-point Likert scale ranging from 1 (Not at all) to 5 (Extremely). The items used to measure anxious affect were 'anxious,' 'worried,' and 'tense;' Cronbach's alpha each week was .82, .84, .85, .87, .87, .86, and .88. The items used to measure depressed affect were 'depressed,' 'miserable,' and 'gloomy;' Cronbach's alpha for each week was .89, .90, .86, .89, .91, .91, and .92.

Weekly Measures Testing. In order to demonstrate that each of the weekly outcome measures were separate concepts and did not vary greatly each week, a series of CFAs tested whether each measure loaded onto four distinct factors over the seven weeks. Each week, a four-factor model was the best fit over a one, two, and three factor model. This confirmed that the weekly measurements were four distinct wellbeing measures, as well as illustrated the measurements were invariant over the seven weeks. A table detailing the results from the CFAs can be found in the Appendix.

Statistical Analysis

To examine the trajectory of each wellbeing measure over seven weeks, multilevel growth curve modelling was utilised. This analysis is favourable for this dataset because the repeated measurements at each seven occasions (level 1) are nested within each participant (level 2; Singer & Willett, 2003). This allowed for an investigation into individual change over time, but also takes into consideration one's previous levels and how those influence future levels. In other words, this analysis estimates between-person differences in within-person change, and uses higher levels of statistical power than more traditional methods (Curran, Obeidat, & Losardo, 2010). This statistical method allowed for modelling individual change over the seven weeks, determined the shape of the growth over this time period, explored the variability within this growth, and examined the influence of perfectionism in both the initial status and the rate of growth.

A process called 'piecewise modelling' was implemented for this dataset, because it is a flexible method that joins two or more trajectories together to represent an intractable nonlinear function (Curran, Obeidat, & Losardo, 2010). In other words, since this data set has seven time points, for a full and more detailed

picture of the shape and rate of growth over this time period, two separate growth models would need to be tested for each wellbeing outcome. First a model tested for the rate of change in recovery, specifically including the two weeks before the vacation and the week of the vacation. Then another model was conducted for the rate of fade-out, which included the week of the vacation and the four weeks following the vacation. The two curves were then 'pieced' together at the vacation week, to represent all seven repeated measures. This same process was used for each of the four wellbeing measures.

A series of models were tested for each wellbeing outcome in order to reach the final, best-fit model. In order to evaluate the fit for each of the different models, -2 log likelihood statistics were used. When doing so, the lower the value of the -2 log likelihood statistic, the better the model fit to the data. A comparison of each model to the previous model can be done by looking at the difference in -2 log likelihood with the degrees of freedom using a typical chi-square distribution. A significant difference between the models' fit indexes indicates a better fitting model (Shek & Ma, 2011).

First, an unconditional model was used to test for any mean differences in the outcome variable across participants without accounting for time. This model calculates the intra-class correlation coefficient (ICC), which estimates how much of the total variation in each wellbeing outcome is due to inter-individual differences. Second, time was added to the model to serve as an unconditional model to examine whether the growth over time was linear or curvilinear. Third, for the fade out analyses, higher-order polynomial models were used to determine the shape of the curve, and how the rate of each outcome changed over the five weeks (i.e., how they accelerated or decelerated across the time period). Since the fade out

data has five time points, the growth curve could either be linear, quadratic, or cubic. This step was not utilised for the recovery models, because there were only three time points, so the growth could only be tested as linear, not curvilinear (Singer & Willet, 2003). Fourth, the control variables were added to the model as a preliminary step before adding the predictor variables. Including the control variables to the model is often referred to as a conditional model; meaning that the growth model is now 'conditioned on' the control variables. Fifth, the final model included the predictor variables into the model, which allowed for an assessment of whether perfectionism was related to each growth parameters (i.e., the initial status and trajectory). This is the second conditional model, therefore the growth model is now 'conditioned on' the predictor variables, above the control variables. The model change between this model and the previous model would determine if adding perfectionism to the model yielded a better fit model. This directly tests the hypotheses, specifically whether perfectionism is predictive of the variance at both the initial starting point and the growth rate over time (Curran, Obeidat, & Losardo, 2010).

The analysis also allows for an examination of the covariance structure. The purpose of testing different covariance structures is to describe how error covariance is distributed. This step is recommended to perform because it improves model predictions and interpretations (Shek & Ma, 2011). For each model, three commonly used covariance structures were tested: unstructured, compound symmetric, and first-order autoregressive. For all of the models tested in the analyses, an unstructured covariance was the best fit covariance structure.

Lastly, the analyses followed a published guideline on how to use SPSS for longitudinal data analysis by Shek and Ma (2011). The analysis was strategically

performed using SPSS 25 to illustrate that advanced statistical analyses can be achieved with packages that are already commonly used within psychological research. Heck and colleagues (2010) compared models in different statistical packages (e.g., HLM, Mplus) and only found small differences between the software. They found SPSS outputs to carry the same fundamental interpretation as the others (Heck, Thomas, Tabata, & Dawsonera, 2010).

Table 1.1

Means, standard deviations, and correlations between study variables.

	M	*SD*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Perfectionistic Strivings	42.65	8.79									
(2) Perfectionistic Concerns	32.87	9.31	.48**								
(3) Age	40.24	10.53	-.20**	-.28**							
(4) Gender°	1.85	0.36	.05	.08	.02						
(5) Conscientiousness	8.50	1.28	.37**	-.05	.13*	.14*					
(6) Neuroticism	6.00	1.81	.22**	.54**	-.12*	.19**	.04				
(7) Emotional Exhaustion	18.66	5.24	.19**	.50**	-.11	.09	.08	.31**			
(8) Cynicism	8.74	3.28	.17**	.51**	-.15*	.08	.02	.29**	.82**		
(9) Anxiety	7.93	2.25	.23**	.55**	-.18**	.09	.03	.44**	.73**	.63**	
(10) Depression	5.67	2.43	.16**	.49**	-.20**	.12*	-.03	.31**	.67**	.71**	.75**

Note: Weekly outcomes were averaged over the seven weeks. *Correlation is significant at the .05 level (2-tailed).

**Correlation is significant at the .01 level (2-tailed). °Male = 1, Female = 2.

Results

General Rate of Recovery and Fade Out

Descriptive statistics and correlations can be found in Table 1.1. In order to test Hypotheses 1, 2, and 3, the general rate of recovery and fade out for each outcome variables were first explored without the control and predictor variables, establishing the shape of the average rate of change for the sample. The first series of models measured the recovery of emotional exhaustion, cynicism, anxious, and depressed affect. For the rate of recovery (i.e., the change trajectories from the two pre-vacation measures to the during-vacation measure) with three repeated measures, only a linear growth could be explored. The results found that the ICC was .47 for emotional exhaustion, .57 for cynicism, .17 for anxious affect, and .41 for depressed affect. The ICC explains the proportion of variance between individuals and justifies using a multilevel approach when the ICC is above .05 (Heck et al., 2010). In support of hypothesis 1, there was a significant drop in levels of emotional exhaustion, cynicism, anxious and depressed affect going into the vacation, indicating teachers had experiences of recovery during the vacation period. The general rate of growth for each outcome is presented in the 'Time Model' column under 'Recovery' in Table 1.2 for emotional exhaustion, Table 1.3 for cynicism, Table 1.4 for anxious affect, and Table 1.5 for depressed affect.

Table 1.2

Multilevel Growth Curve Modelling for Emotional Exhaustion (Recovery and Fade out)

	Time Model			Control Model			Predictor Model		
	Est	SE	*t*	Est	SE	*t*	Est	SE	*t*
Recovery									
Intercept	20.44	.36	56.48***	20.13	.49	41.49***	20.14	.45	44.43***
Time	-2.32	.18	-12.56***	-2.13	.26	-8.30***	-2.13	.26	-8.34***
Gender				.40	.49	.82	.40	.46	.88
Age				-.09	.03	-2.88**	-.06	.03	-2.00*
Conscientiousness				.56	.27	2.06*	.98	.29	3.41**
Neuroticism				.81	.19	4.22***	.12	.21	.59
PC							.30	.05	6.38***
PS							-.13	.05	-2.70**
Time*PC							-.01	.03	-.33
Time*PS							.03	.03	.97
-2 Log Likelihood	4610.52			4573.36			4525.97		
Difference of -2LL				37.16			47.39		
df	6			14			18		
Level 1 intercept (SE)	16.08*** (1.51)			15.87*** (1.47)			15.72*** (1.44)		
Level 2 intercept (SE)	21.41*** (3.29)			17.12*** (2.91)			13.17*** (2.59)		
Level 2 covariance (SE)	-.07 (1.42)			.96 (1.30)			.99 (1.24)		
Level 2 slope (SE)	.35 (1.08)			.05 (1.04)			.07 (1.03)		
Fade out									
Intercept	15.06	.39	39.03***	15.11	.53	28.27***	15.08	.51	29.83***
Time	5.04	.55	9.10***	5.04	.79	6.41***	5.00	.78	6.38***
Time²	-2.00	.35	-5.71***	-2.06	.50	-4.13***	-2.03	.50	-4.09***
Time³	.25	.06	4.42***	.27	.08	3.28**	.27	.08	3.24**
Gender				-.03	.54	-.06	-.02	.51	-.03
Age				.02	.04	.51	.06	.04	1.56
Conscientiousness				-.11	.31	-.36	.14	.33	.41
Neuroticism				.68	.22	3.17**	-.003	.24	-.01
PC							.29	.05	5.41***
PS							-.07	.05	-1.39
Time*PC							.002	.08	.03
Time²*PC							.01	.05	.17
Time³*PC							-.001	.01	-.16
Time*PS							.13	.08	1.61
Time²*PS							-.09	.05	-1.75
Time³*PS							.01	.01	1.72
-2 Log Likelihood	7207.11			7166.07			7109.20		
Difference of -2LL				41.04			56.89		
df	8			24			32		
Level 1 intercept (SE)	11.34*** (.61)			11.23*** (.60)			11.17*** (.60)		
Level 2 intercept (SE)	27.30*** (3.05)			25.82*** (2.91)			21.82*** (2.59)		
Level 2 covariance (SE)	-.71 (.59)			-.96 (.57)			-1.18* (.55)		
Level 2 slope (SE)	.78*** (.20)			.71*** (.19)			.71*** (.19)		

Notes: All cross-level interactions between level-2 controls and time variables were included in the models and tests. Due to parsimony, only the interactions between time variables and predictor variables are displayed in the table. PC: Perfectionistic concerns, PS: Perfectionistic Strivings.

*** $p < .001$, ** $p < .01$, * $p < .05$.

Table 1.3

Multilevel Growth Curve Modelling for Cynicism (Recovery and Fade out)

	Time Model			Control Model			Predictor Model		
	Est	SE	*t*	Est	SE	*t*	Est	SE	*t*
Recovery									
Intercept	9.49	.24	40.20***	9.38	.32	29.63***	9.38	.29	32.78***
Time	-.89	.11	-8.18***	-.91	.15	-6.06***	-.91	.15	-6.10***
Gender				.14	.32	.45	.16	.29	.54
Age				-.07	.02	-3.33**	-.04	.02	-2.14*
Conscientiousness				.18	.18	1.00	.45	.18	2.47*
Neuroticism				.57	.13	4.53***	.02	.13	.15
PC							.23	.03	7.84***
PS							-.08	.03	-2.71**
Time*PC							-.04	.02	-2.40*
Time*PS							.01	.02	.84
-2 Log Likelihood	3843.46			3805.85			3746.10		
Difference of -2LL				37.61			59.75		
df	6			14			18		
Level 1 intercept (SE)	5.30*** (.50)			5.31*** (.50)			5.30*** (.50)		
Level 2 intercept (SE)	10.51*** (1.37)			8.60*** (1.21)			6.13*** (1.02)		
Level 2 covariance (SE)	-1.03 (.54)			-.49 (.49)			-.10 (.45)		
Level 2 slope (SE)	.27 (.37)			.11 (.36)			.05 (.35)		
Fade out									
Intercept	7.49	.22	34.48***	7.35	.30	24.36***	7.34	.29	25.69***
Time	1.10	.15	7.22***	1.20	.22	5.54***	1.19	.22	5.53***
Time²	-.20	.04	-5.45***	-.22	.05	-4.30***	-.22	.05	-4.30***
Time³									
Gender				.23	.31	.74	.23	.29	.79
Age				-.01	.02	-.50	.01	.02	.34
Conscientiousness				-.13	.17	-.72	.05	.19	.27
Neuroticism				.29	.12	2.36*	-.07	.13	-.50
PC							.15	.03	5.12***
PS							-.05	.03	-1.80
Time*PC							.05	.02	2.09*
Time²*PC							-.01	.01	-1.49
Time*PS							.002	.02	.08
Time²*PS							.001	.01	.22
-2 Log Likelihood	5968.30			5937.65			5879.13		
Difference of -2LL				30.65			58.52		
df	7			19			25		
Level 1 intercept (SE)	4.38*** (.23)			4.35*** (.23)			4.33*** (.23)		
Level 2 intercept (SE)	8.39*** (.98)			7.95*** (.94)			6.69*** (.83)		
Level 2 covariance (SE)	.47** (.17)			.36* (.17)			.23 (.16)		
Level 2 slope (SE)	.13* (.06)			.11 (.06)			.09 (.06)		

Notes: All cross-level interactions between level-2 controls and time variables were included in the models and tests. Due to parsimony, only the interactions between time variables and predictor variables are displayed in the table. PC: Perfectionistic concerns, PS: Perfectionistic Strivings.

***$p < .001$, **$p < .01$, *$p < .05$.

Table 1.4

Multilevel Growth Curve Modelling for Anxious Affect (Recovery and Fade out)

	Time Model			Control Model			Predictor Model		
	Est	SE	*t*	Est	SE	*t*	Est	SE	*t*
Recovery									
Intercept	9.42	.19	49.64***	9.40	.25	37.71***	9.41	.23	40.08***
Time	-1.80	.11	-16.76***	-1.86	.15	-12.47***	-1.87	.14	-12.89***
Gender				.01	.25	.04	.01	.24	.04
Age				-.05	.02	-2.90**	-.03	.02	-2.01*
Conscientiousness				.24	.14	1.69	.42	.15	2.81**
Neuroticism				.59	.10	5.95***	.27	.11	2.43*
PC							.14	.02	5.71***
PS							-.06	.02	-2.31*
Time*PC							-.05	.02	-3.61***
Time*PS							.04	.01	2.66**
-2 Log Likelihood	3614.46			3557.81			3523.27		
Difference of -2LL				56.65			34.535		
df	6			14			18		
Level 1 intercept (SE)	5.16*** (.48)			5.16*** (.48)			4.96*** (.44)		
Level 2 intercept (SE)	5.21*** (.93)			3.60*** (.80)			2.84*** (.71)		
Level 2 covariance (SE)	-1.30** (.48)			-.81 (.43)			-.58 (.39)		
Level 2 slope (SE)	.35 (.36)			.18 (.35)			.12 (.32)		
Fade out									
Intercept	5.41	.17	32.72***	5.25	.22	23.46***	5.24	.22	23.92***
Time	4.14	.35	11.85***	4.57	.49	9.25***	4.56	.49	9.30***
Time²	-1.79	.22	-8.08***	-2.08	.31	-6.60***	-2.07	.31	-6.63***
Time³	.23	.04	6.33***	.28	.05	5.43***	.28	.05	5.45***
Gender				.24	.23	1.07	.28	.22	1.24
Age				-.001	.02	-.05	.01	.02	.57
Conscientiousness				-.24	.13	-1.80	-.31	.14	-2.12*
Neuroticism				.28	.09	3.09**	.19	.10	1.88
PC							.02	.02	1.00
PS							.03	.02	1.16
Time*PC							.15	.05	2.96**
Time²*PC							-.06	.03	-1.97*
Time³*PC							.01	.01	1.61
Time*PS							-.04	.05	-.71
Time²*PS							.01	.03	.29
Time³*PS							-.001	.01	-.16
-2 Log Likelihood	5809.98			5742.61			5683.57		
Difference of -2LL				67.37			59.04		
df	8			24			32		
Level 1 intercept (SE)	4.60*** (.25)			4.54*** (.24)			4.49*** (.24)		
Level 2 intercept (SE)	2.29*** (.49)			1.78*** (.44)			1.55*** (.42)		
Level 2 covariance (SE)	.31* (.13)			.23 (.13)			.15 (.12)		
Level 2 slope (SE)	.17** (.06)			.15* (.06)			.12* (.06)		

Notes: All cross-level interactions between level-2 controls and time variables were included in the models and tests. Due to parsimony, only the interactions between time variables and predictor variables are displayed in the table. PC: Perfectionistic concerns, PS: Perfectionistic Strivings.

***$p < .001$, **$p < .01$, *$p < .05$.

Table 1.5

Multilevel Growth Curve Modelling for Depressed Affect (Recovery and Fade out)

	Time Model			Control Model			Predictor Model		
	Est	SE	*t*	Est	SE	*t*	Est	SE	*t*
Recovery									
Intercept	6.32	.19	33.13***	6.09	.25	24.04***	6.09	.24	25.17***
Time	-.92	.10	-9.66***	-.93	.13	-7.08***	-.93	.13	-7.27***
Gender				.31	.26	1.19	.31	.25	1.28
Age				-.07	.02	-3.78***	-.05	.02	-2.70**
Conscientiousness				.10	.14	.71	.26	.15	1.72
Neuroticism				.48	.10	4.72***	.12	.11	1.06
PC							.15	.03	5.92***
PS							-.05	.02	-1.92
Time*PC							-.05	.01	-4.03***
Time*PS							.03	.01	2.32*
-2 Log Likelihood	3514.09			3466.87			3432.09		
Difference of -2LL				47.22			34.79		
df	6			14			18		
Level 1 intercept (SE)	3.77*** (.31)			3.74*** (.31)			3.63*** (.23)		
Level 2 intercept (SE)	6.54*** (.83)			5.17*** (.72)			4.51*** (.54)		
Level 2 covariance (SE)	-1.65*** (.39)			-1.16** (.35)			-.98*** (.18)		
Level 2 slope (SE)	.42 (.27)			.26 (.26)			.21 (.00)		
Fade out									
Intercept	4.24	.15	28.21***	4.01	.21	19.49***	3.99	.20	20.04***
Time	2.00	.29	6.95***	2.26	.41	5.54***	2.25	.40	5.60***
Time²	-.76	.18	-4.16***	-.90	.26	-3.48**	-.89	.25	-3.50***
Time³	.09	.03	3.04**	.11	.04	2.68**	.11	.04	2.68**
Gender				.36	.21	1.71	.39	.20	1.91
Age				-.01	.01	-.96	-.004	.01	-.27
Conscientiousness				-.30	.12	-2.48*	-.34	.13	-2.58*
Neuroticism				.11	.08	1.32	.01	.09	.10
PC							.03	.02	1.53
PS							.02	.02	.81
Time*PC							.18	.04	4.38***
Time²*PC							-.08	.03	-2.94**
Time³*PC							.01	.004	2.35*
Time*PS							-.05	.04	-1.24
Time²*PS							.01	.03	.29
Time³*PS							.0005	.004	.11
-2 Log Likelihood	5502.98			5454.85			5383.41		
Difference of -2LL				48.13			71.44		
df	8			24			32		
Level 1 intercept (SE)	3.09*** (.17)			3.04*** (.16)			2.95*** (.16)		
Level 2 intercept (SE)	2.65*** (.42)			2.34*** (.39)			2.09*** (.37)		
Level 2 covariance (SE)	.43*** (.11)			.36** (.11)			.24* (.10)		
Level 2 slope (SE)	.27*** (.06)			.25*** (.05)			.22*** (.05)		

Notes: All cross-level interactions between level-2 controls and time variables were included in the models and tests. Due to parsimony, only the interactions between time variables and predictor variables are displayed in the table. PC: Perfectionistic concerns, PS: Perfectionistic Strivings.

***$p < .001$, ** $p < .01$, * $p < .05$.

The next series of models explored the rate of fade out (i.e., the trajectory of levels from the during-vacation measure and over the four repeated measures following the vacation) for each of the outcome measures. With five repeated measures, the analysis tested whether the shape of growth for fade out was linear, quadratic, or cubic. The results found that the ICC was .62 for emotional exhaustion, .67 for cynicism, .36 for anxious affect, and .54 for depressed affect. In support of hypothesis 2, there was a significant increase in emotional exhaustion, cynicism, anxious and depressed affect once work resumed, signifying a fade out of vacation benefits. Additionally, the shape of growth for emotional exhaustion, anxious affect, and depressed affect was cubic; indicating a steep incline when work resumed, followed by a decrease in levels, and then another slight increase as time continued. Cynicism, on the other hand, had a quadratic growth; which indicates a steep incline upon returning to work, with a slight decrease with time. These findings highlight that the rate of vacation fade out was curvilinear, not a linear growth, which supports hypothesis 3. Again, the results can be found in the 'Time Model' column under 'Fade out' in Table 1.2 for emotional exhaustion, Table 1.3 for cynicism, Table 1.4 for anxious affect, and Table 1.5 for depressed affect.

Influence of Perfectionism on Rate of Recovery

Multilevel growth curve modelling allowed for testing whether perfectionistic concerns and perfectionistic strivings were significant predictors of the initial status (the first measurement point within the model) and the trajectory (the growth of the repeated measures within the model). For recovery, the initial status represents the first repeated measure two weeks before the vacation, and the trajectory represents the repeated measures the two weeks before the half-term and the week of the half-term.

The results for the initial status found that the perfectionistic concerns dimension was a significant predictor of the variance in levels of emotional exhaustion (β = .30, SE = .05, p < .001, 95% CI [.21, .39]), cynicism (β = .23, SE = .03, p < .001, 95% CI [.17, .29]), anxious affect (β = .14, SE = .02, p < .001, 95% CI [.09, .19]), and depressed affect (β = .15, SE = .03, p < .001, 95% CI [.10, .20]). The positive Beta (β) values here indicate that perfectionistic concerns were positively associated with each outcome measure at the initial status. The perfectionistic strivings dimension was a significant predictor for the variance in levels of emotional exhaustion (β = -.13, SE = .05, p < .05, 95% CI [-.22, -.03]), cynicism (β = -.08, SE = .03, p < .01, 95% CI [-.14, -.02]) and anxious affect (β = -.06, SE = .02, p < .05, 95% CI [-.10, -.01]), but not for depressed affect. The negative Beta values here indicate that perfectionistic strivings were negatively associated with emotional exhaustion, cynicism, and anxious affect at the initial status.

In order to test Hypotheses 4 and 5, the association between perfectionism and recovery trajectories of emotional exhaustion, cynicism, anxious and depressed affect were explored. For the rate of recovery, the perfectionistic concerns dimension was a significant predictor of the variance in the trajectory of cynicism (β = -.04, SE = .02, p < .05, 95% CI [-.06, -.002]; hypothesis 4b), anxious affect (β = -.05, SE = .02, p<.001, 95% CI [-.08, -.02]: hypothesis 4c), and depressed affect (β = -05, SE = .01, p < .001, 95% CI [-.08, -.03]; hypothesis 4d), but not for emotional exhaustion (hypothesis 4a). The negative Beta values here indicate that perfectionistic concerns were negatively associated with the decline in measurement levels during recovery. In other words, those scoring higher in perfectionistic concerns had a steeper rate of recovery for cynicism, anxious and depressed affect compared to those who scored lower in perfectionistic concerns, who had a

less steep slope. The perfectionistic strivings dimension was a significant predictor for the variance in the trajectory for anxious affect ($\beta = .04$, SE = .01, $p < .01$, 95% CI [.01, .07]; hypothesis 5c) and depressed affect ($\beta = .03$, SE = .01, $p < .05$, 95% CI [.005, .06]; hypothesis 5d), but not for emotional exhaustion (hypothesis 5a) and cynicism (hypothesis 5b). The positive Beta values here indicate that perfectionistic strivings were positively associated with the decline in measurement levels during recovery. The pattern of findings indicates that those scoring higher in perfectionistic strivings had a less steep rate of recovery for anxious and depressed affect compared to those who scored lower in perfectionistic strivings, who had a steeper slope. Results can be found in the 'Predictor Model' column under 'Recovery' in Table 1.2 for emotional exhaustion, Table 1.3 for cynicism, Table 1.4 for anxious affect, and Table 1.5 for depressed affect.

Results are also represented as prototypical plots in Figure 1.1 for emotional exhaustion and cynicism, and Figure 1.2 for anxious and depressed affect. Prototypical plots are utilised here because they allow for a demonstration of the effects of the continuous variables: perfectionistic concerns and strivings. The lines on each plot represent the mean scores of each weekly measure for those that scored ±1 SD above/below the mean for perfectionistic concerns and perfectionistic strivings (Singer & Willett, 2003). As these are prototypical plots, they do not represent the results exactly, but allow for a graphical depiction to highlight findings.

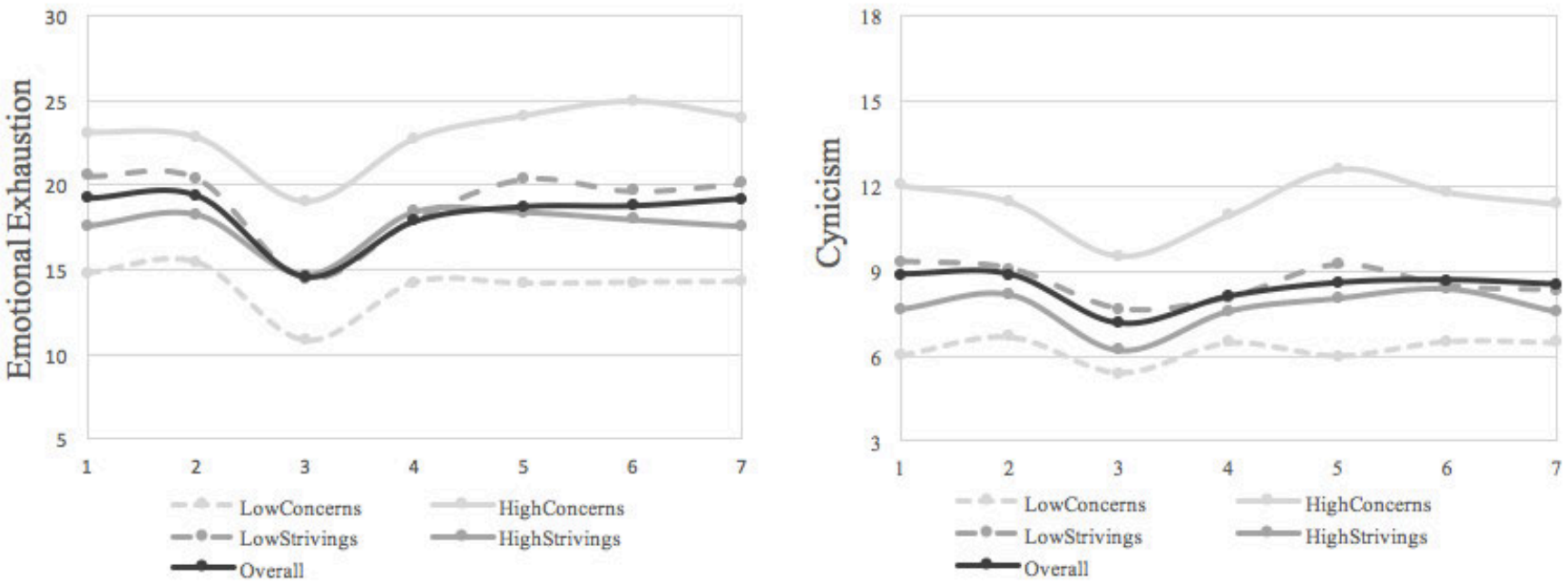


Figure 1.1. Multidimensional perfectionism predicted a different starting point at both week 1 and week 3 for both job burnout measures. However, multidimensional perfectionism did predict a different rate of change in cynicism, but did not predict a different rate of change over the seven weeks for emotional exhaustion. Note: The 'Overall' line represents the weekly average for the whole sample.

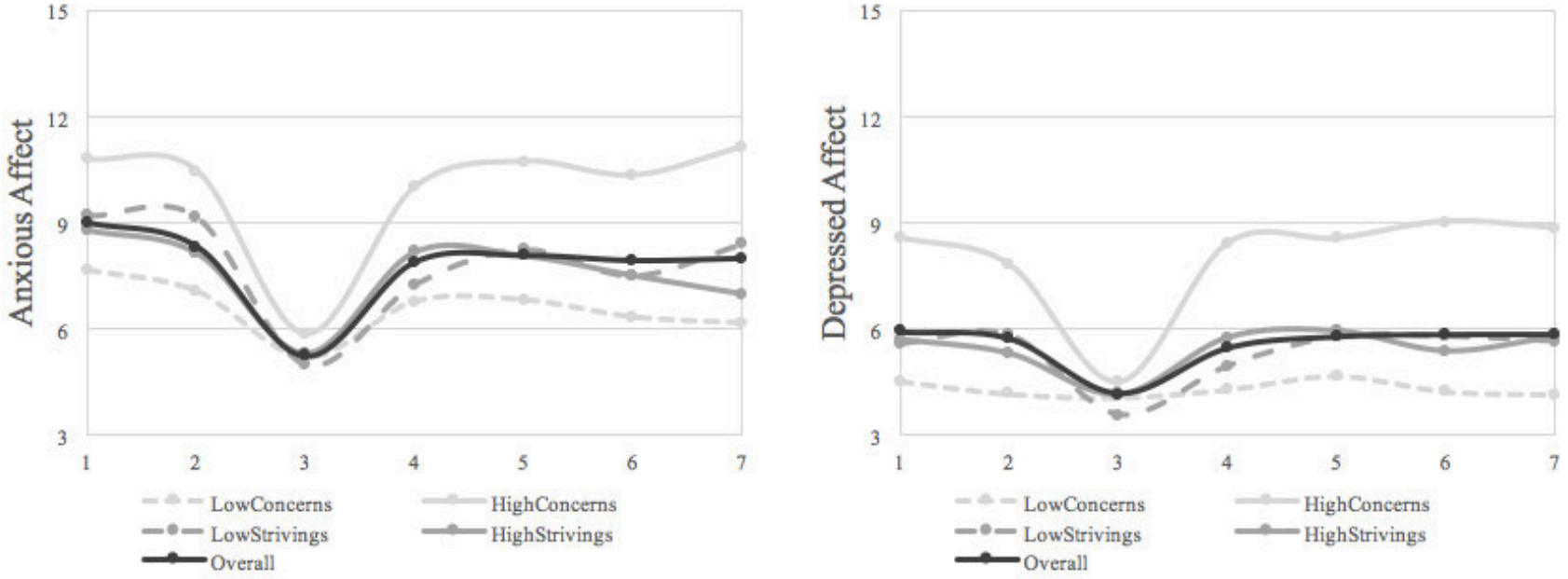


Figure 1.2. For negative affect, multidimensional perfectionism predicted a different starting point at week 1, but not at week 3. Multidimensional perfectionism predicted a different rate of recovery and fade out for both anxious and depressed affect. Note: The 'Overall' line represents the weekly average for the whole sample.

Influence of Perfectionism on Rate of Fade-Out

The analysis for the rate of fade out mirrors the recovery analysis by testing whether perfectionistic concerns and perfectionistic strivings were significant predictors of the initial status and the trajectory. Although, for the rate of fade out, the initial status represents the measurement taken within the half-term week, and the trajectory represents the week of the half-term followed by the four consecutive repeated measures once work resumed.

At the initial status, the perfectionistic concerns dimension was a significant predictor for the variance in levels of emotional exhaustion ($\beta = .29$, SE = .05, $p < .001$, 95% CI [.18, .39]) and cynicism ($\beta = .15$, SE = .03, $p < .001$, 95% CI [.09, .21]), but not anxious and depressed affect. Similar to the recovery analysis, the positive Beta (β) values here indicate that perfectionistic concerns were positively associated with emotional exhaustion and cynicism at the initial status. The perfectionistic strivings dimension was not a significant predictor for the variance in any of the measures during the half-term vacation.

In order to test Hypotheses 6 and 7, the trajectories of outcome levels were explored. For the rate of fade out, the perfectionistic concerns dimension was a significant predictor for the variance in the trajectory of cynicism at the linear slope ($\beta = .05$, SE = .02, $p < .05$, 95% CI [.003, .09]; hypothesis 6b). Additionally, the perfectionistic concerns dimension was a predictor for the variance of anxious affect at the linear ($\beta = .15$, SE = .01, $p<.01$, 95% CI [.05, .25]) and quadratic slopes ($\beta = -.06$, SE = .03, $p < .05$, 95% CI [-.13, .0003]; hypothesis 6c). Lastly, the perfectionistic concerns dimension was also a significant predictor for the variance in the trajectory of depressed affect at the linear ($\beta = .18$, SE = .04, $p < .001$, 95% CI [.10, .26]), quadratic ($\beta = -.08$, SE = .03, $p < .01$, 95% CI [-.13, -.03]), and cubic

slopes ($\beta = .01$, SE = .004, $p < .05$, 95% CI [.002, .02]; hypothesis 6d). The Beta values here correspond with the general growth mentioned above and it can be inferred that those higher in perfectionistic concerns have a more drastic fade out compared to those lower in perfectionistic concerns, who have a more stable trajectory. The perfectionistic concerns dimension was not a predictor for the variance in the trajectories of emotional exhaustion (hypothesis 6a). The perfectionistic strivings dimension was not a predictor for the variance in the fade out trajectory of emotional exhaustion (hypothesis 7a), cynicism (hypothesis 7b), anxious affect (hypothesis 7c), and depressed affect (hypothesis 7d). These findings again, are represented in the 'Predictor Model' under 'Fade out' in Table 1.2 for emotional exhaustion, Table 1.3 for cynicism, Table 1.4 for anxious affect, and Table 1.5 for depressed affect. Results are also represented as prototypical plots in Figure 1.1 for emotional exhaustion and cynicism, Figure 1.2 for anxious and depressed affect.

Discussion

The first aim of this study was to explore the rate of change in both the recovery and fade out of school teachers' work-related emotional exhaustion and cynicism, as well as context-free anxious and depressed affect over a vacation period. The second aim was to examine whether multidimensional perfectionism influenced the rate of change in recovery during the vacation and the fade out of vacation benefits once work resumed. Specifically, to investigate whether perfectionistic strivings and concerns are personality dispositions that either help or hinder school teachers' rates of recovery and fade out over a half-term break.

The findings showed that teachers experienced a decrease in emotional exhaustion, cynicism, anxious and depressed affect going into the vacation and an

increase when returning to work, confirming Hypotheses 1 and 2. As described in the Effort-Recovery (Meijman & Mulder, 1998) and the Allostatic Load Theories (McEwan, 1998), the drop in levels of burnout and negative affect indicate that normal load reactions from work were being alleviated during the time away from work. Without this alleviation during the half-term break, teachers' load reactions would continue to accumulate, which could lead to more chronic health issues (Grund, Brassler, & Fries, 2016). Thus, it is important to highlight that teachers did experience some recovery from negative affect and burnout during the break.

When returning to work, emotional exhaustion, anxious affect, and depressed affect faded out in a cubic growth trajectory, and cynicism in a quadratic growth trajectory, confirming hypothesis 3. When the teachers returned to work, they were again exposed to their typical levels of workload, which can be seen in the rapid increase of burnout and negative affect. Similarly, Syrek and colleagues (2018) found that both positive and negative affect followed a curvilinear trend before, during, and after a Christmas vacation. This study contributes to the growing research into non-linear vacation fade out, specifically by finding that vacation benefits rapidly faded out once returning to work, but as the weeks went by, the fade out become more gradual and fluctuated as work continued.

Perfectionistic concerns and strivings were then added to the models to explore how each contributed to the initial statuses, as well as the trajectories for recovery and fade out. It was found that for emotional exhaustion and cynicism, the perfectionistic concerns dimension was a significant predictor for the variance in initial status both before and during the vacation. This dimension was also associated with a steeper rate of recovery for cynicism (opposing hypothesis 4b) and a steeper rate of fade out (confirming hypothesis 6b) but was not associated with the

recovery or fade out trajectories for emotional exhaustion (rejecting Hypotheses 4a and 6a). The perfectionistic strivings dimension was a significant predictor for the variance at the recovery initial status but was not associated with the rate of recovery or fade out of emotional exhaustion and cynicism, rejecting Hypotheses 5a, 5b, 7a, and 7b. When piecing the models together, it can be inferred that perfectionism influenced the levels of emotional exhaustion during the first week and during the break (via the initial status findings) but did not have a significant effect on the trajectories of recovery and fade out. Although, perfectionistic concerns were contributing to the rate of recovery and fade out of cynicism over the vacation period. These findings are represented in Figure 1.1.

Similarly, the recovery and fade out trajectories of negative affect were also influenced by multidimensional perfectionism. Specifically, the perfectionistic concerns dimension was a predictor for both a steeper rate of recovery and fade out of anxious and depressed affect over the seven weeks, opposing Hypotheses 4c and 4d and confirming Hypotheses 6c and 6d. The perfectionistic strivings dimension was a predictor for a less steep rate of recovery for anxious and depressed affect, opposing hypothesis 5c and 5d. Perfectionistic strivings was not a predictor for the variance in fade out once work resumed, rejecting hypothesis 7c and 7d. When piecing the recovery and fade out trajectories together, it can be inferred that higher levels of perfectionistic concerns predicted more drastic growth patterns over the seven weeks, where higher levels of perfectionistic strivings predicted a more stable trajectory. These findings are represented in Figure 1.2.

Theoretical Contributions

First, these findings have potential implications for the study of multidimensional perfectionism and burnout. The findings revealed differences

between emotional exhaustion and cynicism in relation to perfectionism. For emotional exhaustion, perfectionism predicted levels of emotional exhaustion but did not have an influence on the recovery and fade out trajectories. Specifically, perfectionistic concerns were positively related and perfectionistic strivings were negatively related to emotional exhaustion before and during the vacation. While levels of emotional exhaustion have often been related to multidimensional perfectionism (see Hill & Curran, 2016; Moate et al., 2016; Stoeber & Rennert, 2008), there lacks any evidence that suggests multidimensional perfectionism contributes to the rate of recovery or fade out of emotional exhaustion. These findings suggest that the changes in emotional exhaustion might be more influenced by work factors or the working environment, rather than by multidimensional perfectionism. For cynicism, perfectionistic concerns were positively related to cynicism before and during the vacation, as well as being negatively related to the rate of recovery and positively related to the rate of fade out. Simply put, those higher in perfectionistic concerns were also higher in cynicism before and during the break, and had a steeper rate of recovery and fade out. Cynicism is often viewed as a coping strategy to deal with work-related stress (Alarcon, Eschleman, & Bowling, 2009). In this case, perfectionistic concerns are also associated with higher emotional exhaustion, therefore the increased cynicism could be attributed as an attempt to cope with the elevated exhaustion.

Overall, emotional exhaustion decreased during the half-term break and increased when returning to work, whereas cynicism followed those patterned but with more drastic recovery and fade out trajectories around the half-term break. According to previous research, burnout would be most prevalent during working weeks because it is an emotional reaction to a stressful working

environment (Maslach & Jackson 1984; Maslach, Schaufeli, & Leiter, 2001). Vacations offer employees the opportunity to escape workplaces that harbour a stressful environment which can spread experiences of burnout, also known as a burnout climate (Westman & Eden, 1997). The teaching profession has routinely been shown to have a high burnout climate, with previous research showing that school teachers experience some of the highest levels of stress on the job (Childs & Stoeber, 2012; Flett, Hewitt, & Hallett, 1995; Hill & Curran, 2016; Maslach, Schaufeli, & Leiter, 2001; Slade & Owens, 1998). The findings have shown that while the teachers are away from their specific burnout climate, their levels of emotional exhaustion and cynicism decreased, indicating some relief from their typical day-to-day work-related stress. However, as soon as they returned to work, they were again exposed to their burnout climate, thus any benefits gained from the vacation quickly faded out.

Second, the findings also have theoretical implications for the study of multidimensional perfectionism and the diathesis-stress model for anxious and depressed affect. Perfectionism has been theorised to be more or less salient, depending on the environment. It has been reported to be the most salient within the workplace, due to the interpersonal, performance, and achievement-related stressors (Harari et al., 2018). While outside of the working environment, perfectionism has been found to be less salient, or even remain dormant during a respite from work (Flaxman et al., 2012). The diathesis-stress model explores how traits interact with the environment to produce disorders, such as anxiety and depression. Both the diathesis and a stressor must be present for there to be an impact on an individual's wellbeing (Zuckerman, 1999). In this case, multidimensional perfectionism is interacting with teachers' stressful working environment to produce anxious and

depressed affect. These finding are highlighted in Figure 1.2, where you can see the different starting points and recovery trajectories of perfectionistic concerns and strivings come together to a similar point during the vacation; then, the differing fade out trajectories separate again when the teachers return to work. During the vacation, the lack of work-related stress meant the teachers' perfectionism remained inactive and could not produce elevated levels of anxious and depressed affect.

However, upon returning to work, only the perfectionistic concerns dimension acted as a diathesis to produce a steeper fade out of negative affect, while perfectionistic strivings did not. Previous researchers have found that stressors are especially likely to produce disorders if they pose a threat to a central aspect of the self. Perfectionistic concerns may contribute to anxious and depressed affect due to a specific vulnerability to interpersonal stressors or social-evaluative stress. Unlike perfectionistic strivings, perfectionistic concerns involve a want to avoid failure, a fear of negative evaluation, and need for acceptance and approval (Harari et al.,2018; Hewitt & Flett, 1993). These central aspects of perfectionistic concerns are prevalent during working periods, and in this case, interact with interpersonal stressors to produce higher levels of anxious and depressed affect when returning to work after a vacation.

Lastly, this research also adds to the growing research into the interaction or overlap between the two dimensions of perfectionism. Previous research has found that perfectionistic strivings and concerns are often highly correlated (Stoeber & Gaudreau, 2017); in this case, the two had a moderate positive correlation (r = .48), indicating a relatively large overlap between the two dimensions. Meaning, higher levels of perfectionistic strivings are associated with higher levels of perfectionistic concerns, and vice versa. In the analysis, both dimensions were entered into each

model, which then 'partials out,' or controls for, the overlap between the two dimensions. Previous research has argued that when the negative associations of perfectionistic concerns are suppressed, perfectionistic strivings are associated with more positive outcomes (Hill, 2014; 2017; Stoeber & Damian, 2016). Although, according to Stoeber and Gaudreau (2017), 'partialling is essential if we want to understand the shared, unique, combined, and interactive relations of the different dimensions of perfectionism' (Stoeber & Gaudreau, 2017, p. 379).

The current research found that when perfectionistic concerns were controlled for, perfectionistic strivings were negatively associated with burnout and negative affect. In this case, it may seem as though perfectionistic strivings benefit employees, but only when perfectionistic concerns were controlled for. The overlap here and in previous research (see Childs & Stoebe, 2010r; Flaxman et al., 2018; Stoeber & Damian, 2016; Stoeber & Rennert, 2008) suggests that it is important to make distinctions between a self-oriented striving for perfection and the fear of losing the illusion of perfection. As a whole, the consequences of perfectionism on vacation recovery and fade out seem to outweigh any benefits.

Methodological Contributions

First, this research project made methodological contributions by being the first to investigate school teachers' half-term vacation using a seven-week longitudinal research design. Second, the use of multilevel growth curve modelling allowed for an investigation in the rate of growth over this vacation period, as well as examined the fade out of vacation benefits as non-linear, which has only recently been added to the vacation literature (see Syrek et al., 2018). Third, including both work-related and context-free measures of wellbeing measured on the same response timeline (i.e., over the past week) enabled an exploration and comparison into

different aspects of the employees' wellbeing, as well as exploring the measures themselves and how employees are able to recover and fade out from various measures of wellbeing.

Another methodological contribution was the use of both the MPS (Hewitt & Flett, 1991b) and the FMPS (Frost et al., 1990) multidimensional perfectionism scales to explore the multiple sub-facets within the two higher-order perfectionistic strivings and concerns. Likewise, controlling for neuroticism, conscientiousness, age, and gender also allowed for research beyond higher level traits, as suggested by previous researchers (Flett & Hewitt, 2006; Moate et al., 2016). This allowed for a more robust investigation into multidimensional perfectionism, specifically higher-order perfectionistic concerns and perfectionistic strivings, which until now has never been done within the context of vacation recovery and fade out.

Limitations and Directions for Future Research

Some limitations to this research should also be considered. First, this research relied exclusively on self-report data; however, the aim was to investigate subjective constructs, thus self-reports are the most efficient means to investigate this (Kompier, 2005). Future research could consider exploring other types of data, such as objective physiological responses to stress. Second, the control variables, conscientiousness and neuroticism, were only measured on a two-item scale. Although the reliability was moderate, a full version of the Big Five Inventory would have yielded higher reliability. Third, the short-form version of cynicism has not yet been validated in previous research. Though, the emotional exhaustion subscale from the same scale, has been validated and the thorough measurement testing adds to this measurement's reliability. Fourth, when analysing the rate of recovery with three time points, only a linear growth could be explored. It is

recommended that future research include more time points before the vacation period in order to explore recovery as curvilinear (see Syrek et al., 2018). Fifth, this research relied heavily on measuring employee wellbeing in terms of negative outcomes; thus, there lacks an understanding of possible positive outcomes that could have been explored, as well as non-wellbeing measurements of employees' work experience, such as job satisfaction or job performance. Sixth, previous research has found an influence of vacation activities and experiences to affect wellbeing (de Bloom et al., 2009; 2011; 2013), and this current research did not have any uniformity in vacation activities or experiences.

Lastly, this research examined teachers' experience of a week-long half-term vacation; therefore, these findings may not be generalisable to other occupational groups or to other lengths of vacation (Flaxman et al., 2012; Kühnel & Sonnentag, 2011). It is recommended that future research continues to investigate the rate of change experienced over varying vacation periods and with different occupational groups. It is hoped that future vacation research continues to embrace more advanced statistical analyses to gain a fuller understanding of vacation effects, particularly when it comes to vacation fade out. Varying the lengths of vacations, the number of repeated-measures, and including a control group would add additional knowledge to the vacation literature. Further research should continue to investigate individual differences, particularly multidimensional perfectionism and its within-person combinations (see Gaudreau & Thompson, 2010) as possible predictors for the variance in the rate of change over a vacation period.

Practical Implications

These findings highlight the importance of a vacation to teachers' wellbeing, especially those more vulnerable to work-related stress. Respite-oriented

interventions that offer guidance on ways to recover during a vacation and prolong the benefits gained during that period would be helpful for all employees. Hahn, Binnewies, Sonnentag, and Mojza (2011) found that a recovery training programme was able to increase recovery experiences by identifying and practicing recovery strategies, such as detaching from work. These types of training programmes would especially be beneficial to those who may be high in perfectionistic concerns. Alternatively, interventions such as cognitive behavioural therapy and mindfulness-based training programmes have been found to reduce negative aspects of perfectionism (Lloyd, Schmidt, Khondoker, & Tchanturia, 2015; Wimberley, Mintz, & Suh, 2016).

The findings from this research suggest that employees recover during a week-long vacation, but the benefits from a vacation begin to rapidly decrease when returning to work. At the organisational level, in an effort to slow down the fade out of vacation benefits, it is recommended to reduce high workloads as soon as employees are returning to work. Easing back into work and creating an even pace of workload would reduce that initial decrease in wellbeing when work resumes and prolong the benefits that vacations bring to employees (de Bloom, 2015).

Conclusion

Despite the growing interest in employees' vacation recovery and fade out experiences, there is still little understanding of the rate of recovery and fade out, as well as potential individual differences that may be helping or hurting employees over vacation periods. This study tested how two perfectionism dimensions impacted the rate at which school teachers recovered during a half-term break and the rate at which the benefits gained during the vacation faded out. This research highlights the importance of using nonlinear statistics when exploring a vacation

period, in addition to identifying certain personality dispositions that may be having detrimental effects on employees' health and wellbeing. It is hoped that the findings of this study encourage further research into possible individual differences that enhance or damage employees' vacation experiences.

Chapter 4: Within-person combinations of multidimensional perfectionism and school teachers' wellbeing during a working week and during a vacation week

Introduction

Recent reports have found that perfectionism is on the rise in newer generations (Curran, Hill, & Williams, 2017). A need to be perfect, including anxiety over making mistakes, tends to be heightened within the workplace due to the desire to succeed in one's career, as well as the fear of losing one's job. There is an assumption that this need to be perfect is beneficial to organisations, and they tend to view perfectionism as a value, or at the very least a desirable weakness for their employees to possess (Ozbilir, Day, & Catano, 2014; Stoeber & Damien, 2016). However, research has continued to find that the consequences of perfectionism outweigh any benefits for employees' individual health and wellbeing (Harari et al., 2018). Therefore, there appears to be a discrepancy between the standards that organisations appear to desire in employees, and the impact trying to uphold this standard is having on the employees themselves. But, is there a possibility that there exists a scenario in which employees may be perfectionistic in their work without the negative impact on their health and wellbeing? Or, is it always the case that trying to be perfect only results in negative consequences for individuals?

Perfectionism has typically been considered a maladaptive personality trait (e.g., Burns, 1980; Pacht, 1984; see Flett & Hewitt, 2002 for a review). However, some researchers have suggested that certain aspects of perfectionism could be adaptive (see Enns & Cox, 2002 for a review). Perfectionism, as a multidimensional personality disposition, harbours aspects on both sides of the (mal)adaptive spectrum. The potentially adaptive aspects of perfectionism organise

themselves into the perfectionistic strivings dimension of perfectionism, whereas the maladaptive aspects of perfectionism organise themselves in the perfectionistic concerns dimension of perfectionism. However, there is an ongoing debate on the adaptiveness versus mal-adaptiveness of perfectionistic strivings, with research finding differing results; thus, more research is required before conclusions can be made (e.g., Flett & Hewitt, 2006; Greenspon, 2000; Owens & Slade, 2008; Stoeber, 2012; Stoeber & Otto, 2006).

Traditionally, researchers investigating perfectionism follow a variable-centred approach investigating individual differences in perfectionistic strivings and perfectionistic concerns. This technique looks at each dimension separately, even though perfectionistic strivings and concerns tend to positively correlate, implying an overlap between the two dimensions (Stoeber & Gaudreau, 2017). Thus, researchers have begun to investigate a person-centred approach to investigating perfectionism, which considers the overlap between the dimensions. This approach looks specifically at the differences between different 'subtypes' or 'combinations' of perfectionism (Stoeber, 2012). The different subtypes of perfectionism have high and/or low levels of both perfectionistic concerns and strivings. This conceptualisation allows for an investigation into how perfectionism is organised within individuals, and how belonging to a certain subtype of perfectionism impacts individuals' health and wellbeing. This also offers the possibility to explore when the levels of the perfectionism dimensions might be working together to produce beneficial effects for individuals and when they might be causing the most detrimental effects.

The first aim of this research is to explore how the two facets of perfectionism are organising themselves within this sample of school teachers.

Specifically, this study will be exploring how many subtypes of perfectionism are present within this sample, directly testing the different theoretical models that explore the combinations of perfectionistic strivings and concern. This will then uncover the different levels of perfectionistic strivings and concerns in each subtype, which will be used to determine if they follow the parameters or levels that theory suggests they should. For example, do those in the non-perfectionism group have low levels of both perfectionistic strivings and concerns? Then, once the subtypes have been established, the aim is to explore how being a member of each subtype impacts the school teachers' wellbeing. In particular, this study is interested in exploring whether perfectionism's impact on wellbeing is present during a working week and if it is having the same effect during a vacation week for each subtype of perfectionism, thus directly testing the diathesis-stress hypothesis.

Within-Person Combinations of Perfectionism

Perfectionism is a personality trait that is now widely accepted as being a multidimensional construct (e.g., Hill & Curran, 2016; Stoeber & Gaudreau, 2017). Specifically, various perfectionistic facets have been found to factor into two higher-order dimensions known as *perfectionistic concerns* and *perfectionistic strivings*. Perfectionistic concerns include facets associated with the fear and concern over making mistakes, having negative reactions to imperfection, and the assumption that perfection is expected of them from others. Perfectionistic strivings include facets associated with the tendency to be self-motivated to achieve a level of perfection and setting excessively high standards for their performance (Stoeber, 2012). When the two dimensions' associations with wellbeing measures are investigated, they show different, and often opposite, patterns of association (Stoeber & Damian, 2016). However, perfectionistic strivings and concerns have been found to also

show moderate positive correlations with each other (Stoeber & Gaudreau, 2017), indicating an overlap between the two dimensions. Gaudreau (2013) states that 'there seems to be a consensus that perfectionism should be studied as a disposition composed of two core dimensions that might combine, interact, or suppress the effects of one another to predict consequential life outcomes' (Gaudreau, 2013, Page 354). Additionally, researchers have hypothesised that all individuals possess varying levels of both perfectionistic strivings and concerns (Gaudreau & Thompson, 2010; Rice & Ashby, 2007).

The two dimensions have traditionally been researched as continuous variables exploring the between-person differences of perfectionistic concerns and perfectionistic strivings against various wellbeing indicators. Although, recently there has been a growing interest into the within-person combinations of perfectionistic strivings and concerns, as well as the shared variance between the two dimensions (Gaudreau & Thompson, 2010; Rice & Ashby, 2007). In doing so, the interaction between perfectionistic strivings and concerns becomes the focus rather than the two dimensions themselves (Gaudreau & Thompson, 2010). In an attempt to understand the overlap between perfectionistic concerns and strivings, researchers have begun investigating the differences between 'subtypes' of perfectionism (e.g., Parker, 1997; Rice & Ashby, 2007; Rice & Slaney, 2002).

The tripartite model, developed by Parker (1997) and continued by Rice and Ashby (2007), was the first to explore subtypes of perfectionists which included healthy perfectionists, unhealthy perfectionists, and non-perfectionists. Adaptive perfectionists are characterised as being low in perfectionistic concerns and high in perfectionistic strivings. Maladaptive perfectionists are characterised as being high in perfectionistic concerns and high in perfectionistic strivings. Lastly, non-

perfectionists are characterised as just being low in perfectionistic strivings, regardless of levels of perfectionistic concerns (Rice & Ashby, 2007; Stoeber & Otto, 2006).

Gaudreau and Thompson (2010) proposed a quadripartite model of perfectionism, which included subtypes that differentiated those that are low in perfectionistic strivings and are either high or low in perfectionistic concerns. Their new conceptualisation of the within-person combinations of perfectionism is referred to as the 2x2 model of perfectionism (Gaudreau & Thompson, 2010). This model contains four subtypes of perfectionism with corresponding levels of both perfectionistic concerns and strivings. Specifically, the model includes pure perfectionistic strivings (Pure PS; high strivings, low concerns), pure perfectionistic concerns (Pure PC; low strivings, high concerns), mixed perfectionism (high strivings, high concerns), and non-perfectionism (low strivings, low concerns; Gaudreau & Thompson, 2010). Figure A visually represents the two models of within-person combination of perfectionism. These differences between the tripartite and 2x2 model of perfectionism suggest that the 2x2 model may be the best fitting theoretical model to represent the within-person combinations of perfectionism.

Establishing the subtypes of perfectionism. When discussing the within-person combinations of perfectionism it is important to be clear on how the perfectionistic concerns and strivings are being combined to create the three or four categorically separate subtypes. The within-person combinations of perfectionism were first and foremost theory-driven and conceptually created, and should be interpreted as a heuristic (Gaudreau, 2012). Thus, the different subtypes should be analysed as quantitative distributions of perfectionistic strivings and concerns, rather than dichotomies that are separated by a predetermined point. For example, cluster

analyses, multiple regressions, and latent class analyses should be utilised over median-split techniques to increase the likelihood of uncovering interactions (Bissonnette, Ickes, Bernstein, & Knowles, 1990; Gaudreau 2012).

One benefit to using categorical approaches, usually in the form of cluster analyses, allow for an exploration into how many clusters (or subtypes) are being represented within the data. Previous research has found support for both the tripartite (e.g., Rice & Ashby, 2007) and the 2x2 model of perfectionism (e.g., Boone, Soenens, Braet, & Goossens, 2010). However, cluster analysis has been criticised because identifying the appropriate number of clusters can be very subjective within the analysis (Ruscio & Ruscio, 2004; Richardson, Rice, & Devine, 2014). However, Hair and colleagues (2010) suggest that when performing cluster analyses, it is important to use both hierarchical and non-hierarchical cluster analysis methods to offset any weaknesses within the analyses (Hair, Black, Babin, & Anderson, 2010; also see Li et al., 2014).

The first aim of this research is to directly test whether the tripartite or the 2x2 model of perfectionism is the better fit theoretical framework for this sample of school teachers. This research will utilise both hierarchal and non-hierarchical cluster analyses to determine whether a three or four cluster model is the best fit. Due to the separation between Pure PC and non-perfectionists within the 2x2 model, is it predicted that the 2x2 model of perfectionism will be a better fit to the tripartite model.

Hypothesis 1: A four cluster solution will be a better fit than a three cluster solution, indicating that the 2x2 model of perfectionism is a better representation of the within-person combinations of perfectionism compared to the tripartite model.

After the number of clusters is determined, the next aim of this study is to explore whether the data-driven clusters' parameters or levels follow the same theoretical parameters that have been set out from the theories of the tripartite model or the 2x2 model of perfectionism. When exploring the two theoretical representations for the combinations of perfectionism, it is important to consider two main questions (see Li et al, 2014). First, are each of the clusters distinctly different from one another? Both models make the assumption that the different clusters do not overlap, which might not necessarily be the case. Consequently, it is crucial to test whether all of the clusters represent distinctly different combinations of perfectionism. Second, do those with low level of perfectionistic strivings split into two groups (Pure PC and non-perfectionism)? Within the tripartite model they do not and within the 2x2 model they do, thus it is imperative to investigate whether this distinction is present in the data-driven clusters.

Li and colleagues (2014) found that the 2x2 model of perfectionism was a better fit than the tripartite model in their sample of Chinese employees (Li et al., 2014). Although, there were slight discrepancies between their data-driven cluster results and the theoretical parameters set out by the 2x2 model. Specifically, they reported that their Pure PC subtype had lower levels of perfectionistic concerns and higher levels of perfectionistic strivings than they originally expected. The discrepancies in conceptualising perfectionism may limit the interpretation of results within the 2x2 model (Li et al., 2014). Thus, the aim is to identify the structure of perfectionism from a data-driven perspective to see whether it aligns with the theoretically driven parameters. Within this sample of teachers, it is predicted that the theoretically driven parameters set out by the 2x2 model of perfectionism will correspond with the data-driven clusters.

Hypothesis 2: The parameters within each cluster will follow the parameters set out by the 2x2 model of perfectionism, in the form of Pure PS, Pure PC, mixed Perfectionism, and non-Perfectionism.

2x2 Model of Perfectionism and Measures of Wellbeing

Within the 2x2 model's conceptualisation, four hypotheses were proposed by Gaudreau and Thompson (2010) for further theoretical development of the model. Using these hypotheses, research has provided insight into the different subtypes of perfectionism and the relationship to wellbeing measures (Franche, Gaudreau, & Miranda, 2012). Pure PS has been associated with higher levels of satisfaction and positive affect (Cumming & Duda, 2012; Gaudreau & Thompson, 2010), and lower levels of depressive symptoms (Douilliez & Lefevre, 2011), when being compared to non-perfectionists (supporting hypothesis 1a). However, Pure PS and non-perfectionists were also found to have no difference in levels of negative affect and wellbeing (supporting hypothesis 1c). Pure PC has been found to have the lowest levels of psychological adjustment, including the lowest levels of positive affectivity, satisfaction, and wellbeing compared to the other combinations (supporting hypotheses 2 and 3). Mixed perfectionists have been found to have lower levels of positive affectivity and satisfaction compared to Pure PS (supporting hypothesis 4), although have also been found to have similar levels of wellbeing and depressive symptom as Pure PC (Gaudreau & Verner-Filion, 2012).

In the only investigation of the 2x2 model in a working population, Li and colleagues (2014) investigated the relationship between subtypes of perfectionism, different coping styles, and levels of burnout among IT workers in China. They found that Pure PS and non-perfectionists had significantly lower levels of burnout compared to mixed perfectionists and Pure PC. This supports hypothesis 1a, 2, and 4

of Gaudreau and Thompson's (2010) model. This indicates that the higher levels of perfectionistic concerns in mixed perfectionism and Pure PC were linked to higher levels of burnout, while lower levels of perfectionistic concerns in Pure PS and non-perfectionists were linked to lower levels of burnout (Li et al., 2014). However, since this is the only research on a working population, there is still little known about the subtypes of perfectionism within the workplace.

The current research will continue to expand the 2x2 model of perfectionism research within the workplace and investigate the subtypes in a sample of school teachers. This research will explore the subtypes of perfectionism and the association with two measures of job burnout, in the form of emotional exhaustion and cynicism. Additionally, this research will also measure both positive (enthusiasm and comfort) and negative (anxious and depressed) affect. This research will follow the suggested hypotheses set up by the 2x2 model of perfectionism.

Hypothesis 3: Pure PS will have lower burnout and negative affect, and higher positive affect compared to non-perfectionists.

Hypothesis 4: Pure PC will have higher burnout and negative affect, and lower positive affect compared to non-perfectionists.

Hypothesis 5: Mixed perfectionists will have lower burnout and negative affect, and higher positive affect compared to Pure PC.

Hypothesis 6: Mixed perfectionists will have higher burnout and negative affect, and lower positive affect compared to Pure PS.

Perfectionism and the Diathesis-Stress Model

Perfectionism can be present in many areas of life, although the workplace contains specific stressors, such as achievement-oriented expectations, that might activate or enhance perfectionistic beliefs and behaviours within employees. While

researching perfectionism's influence on employees' wellbeing, there is a growing interest in investigating whether perfectionism is only active during working periods, when work-related stressors are present (Flaxman et al., 2012). It has been suggested that perfectionism functions as a diathesis and interacts with work-related stressors to produce poor wellbeing (Enns, Cox, & Clara, 2005; Flett et al., 1995).

The perfectionism diathesis-stress model was developed from the congruency model, which posits that stressors are more likely to produce negative outcomes if they pose a particular threat to a central aspect of the self (Hewitt & Flett, 1993; Oatley & Bolton; 1985). When the environmental stress is congruent with the corresponding dimensions of perfectionism, the stress has more impact (Blankstein, Lumley, & Crawford, 2007; Chang & Rand, 2000). Specifically, the achievement-stress present within the workplace, whether it be inter- or intra-personal, would interact with perfectionistic concerns and strivings to predict distress. Thus, without the presence of work-related stressors during a vacation week, the negative impact of perfectionism should remain dormant or benign (Flaxman et al., 2012). It is predict that during the half-term break, perfectionism will remain dormant, which will result in no significant difference between the subtypes of perfectionism while away from work.

Hypothesis 7: During the vacation week, perfectionism will not be activated, therefore there will be no significant differences between the subtypes of perfectionism on the measures of burnout and affective wellbeing.

Method

The dataset used for this research study is the same data that were collected for Chapter 3. The participants, design, and procedure were the same, although there were differences in the variables used and the statistical analyses used. The new

variables used for this study will be explained further in this section, but for a more detailed explanation of the participants, design, procedure, and variables used refer to Chapter 3.

Participants, Design, and Procedure

Participants were 280 teachers, head teachers, and teaching assistants from various schools around the United Kingdom and the United States. The sample was predominately female (85%) and had an average age of 40.24 (SD = 10.53). The sample had an average tenure of 13.44 (SD = 9.15) years, with 211 (67.37%) being from the United Kingdom, and 69 (32.7%) from the United States.

A seven-week longitudinal design was implemented which included school teachers' week-long half-term vacation period. Within the seven weekly surveys, for this research, only the first weekly survey was used for the working week measure and the third weekly survey was used for the vacation week (this was the only vacation week). The week before the vacation and the four weeks following the vacation were not used within this research study.

Data collection took place over the 2016 and 2017 academic school years, and included both the February and May half-term breaks in the United Kingdom, as well as Presidents' Week and Spring Break in the United States. Following recruitment, an initial survey was distributed prior to the first weekly survey to record demographic information, as well as the perfectionism measures. The participants were then asked to complete a weekly survey each Friday as soon as possible at the end of the working day.

Initial Measures

Perfectionism. Perfectionism was measured using the short-form Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991b) and the short-

form Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990; also see Cox, Enns, & Clara, 2002).

Control Variables. The same control variables were used in this study as the previous study which included age, gender, neuroticism, and conscientiousness. Further details on the control variables and measurement testing for the initial variables, which verify that neuroticism and conscientiousness are their own constructs compared to perfectionism, can be found within the Method section of Chapter 3.

Weekly Measures

Affective Wellbeing. To include measures of both positive (enthusiasm and comfort) and negative (anxious and depressed) affective wellbeing, we used the four-quadrant model of affective wellbeing to distinguish the different measures from Warr's (1990) Affective Well-Being scales (also see Daniels et al., 1997; Mäkikangas, Feldt, & Kinnunen, 2007). Participants were asked over the past week how much they felt each of the emotions and responses were given on a five-point Likert scale ranging from 1 (Not at all) to 5 (Extremely). The items used to measure enthusiasm affect were 'excited,' 'alert,' 'energetic,' and 'enthusiastic;' Cronbach's alpha for the working week was .81 and for the vacation week was .88. The items used to measure comfort affect were 'relaxed' and 'calm;' Cronbach's alpha for the working week was .83 and for the vacation week was .91. The items used to measure anxious affect were 'anxious,' 'worried,' and 'tense;' Cronbach's alpha for the working week was .82 and for the vacation week was .85. The items used to measure depressed affect were 'depressed,' 'miserable,' 'sad,' and 'gloomy;' Cronbach's alpha for the working week was .91 and for the vacation week was .89.

In order to demonstrate that each of the affective wellbeing measures were

separate concepts and did not cross quadrants, a series of CFAs tested whether each measure loaded onto four distinct factors. For both weeks, a four-factor model was the best fit over a one-factor model and a two-factor model (separating negative and positive affect). This confirmed that the affective wellbeing measurements were four distinct wellbeing measures and followed the four quadrant model. A table detailing the results from the CFAs can be found in the Appendix.

Emotional exhaustion and cynicism. The same items were used for the emotional exhaustion and cynicism variables that were used in Chapter 3. Emotional exhaustion and cynicism were measured with the Maslach Burnout Inventory (MBI-GS; Schaufeli et al., 1996; also see Flaxman et al., 2018).

Statistical Analysis

Cluster Analyses. The first aim of this research was to investigate whether the sample of teachers' within-person combinations of perfectionistic concerns and strivings follow the tripartite or 2x2 models of perfectionism. Specifically, we wanted to investigate whether a three or four-cluster solution was a better fit for the data. The second aim was to test if the data-driven cluster parameters follow the theoretical parameters for the best fit model.

A two-step cluster analysis will be utilised, using both hierarchical and non-hierarchical analyses (also see Rice & Ashby, 2007; Li et al., 2014). Hierarchical cluster analysis will first be used to determine the number of clusters that the participants are being organised into. In this analysis, there is no set number of clusters indicated at the beginning, so they are able to freely cluster. The number of clusters are determined by the dendrogram and the agglomeration schedule. This will inform the best cluster solution. Then a K-means cluster analysis will be utilised to force the cluster number and determine the cluster membership of each

participant. This will allow us to see how many participants belong to each cluster, and what the parameters are for each cluster.

MANOVAs. The next aim of the research was to see how being a member of these different subtypes of perfectionism impacts wellbeing during a working week and a vacation week. Once we know each participants' cluster membership, we are able to run analyses that compare each of the subtypes. For each week, a one-way between-groups multivariate analysis of variance was conducted to compare how the different combinations of perfectionism differ on the measures of affective wellbeing and burnout. The independent variable for each analysis was the cluster membership for the subtypes of perfectionism (determined by the cluster analysis). The dependent variables were emotional exhaustion, cynicism, enthusiasm, comfort, anxious, and depressed affect. Participants' age, gender, and levels of neuroticism and conscientiousness were used as covariates within the analyses.

Results

Cluster Analysis

The results from the hierarchical cluster analysis indicate that a four cluster solution (the 2x2 model) was a better fit compared to a three cluster solution (the tripartite model). By examining the Agglomeration Schedule and Dendrogram, it was clear that a four cluster solution is the best fit for this sample of teachers, confirming hypothesis 1. The Dendrogram and a chart of the agglomeration schedule can be found in the Figure 2.1. The Agglomeration Schedule is represented in graphical form and can be interpreted by identifying an 'elbow,' which represents the jump in the coefficient values (Yim & Ramdeen, 2015). The results indicate the jump occurs from 9 to 10, therefore the elbow is at 9. The number of clusters can be determined by the number of points from the elbow to the

final point. Additionally, when examining the Dendrogram, a four cluster solution is represented by the number of clusters that are formed. Reading the Dendrogram from the left to the right shows each participant being clustered by similarity. By examining the horizontal line at 10, the Dendrogram indicated four grouping clusters (Yim & Ramdeen, 2015).

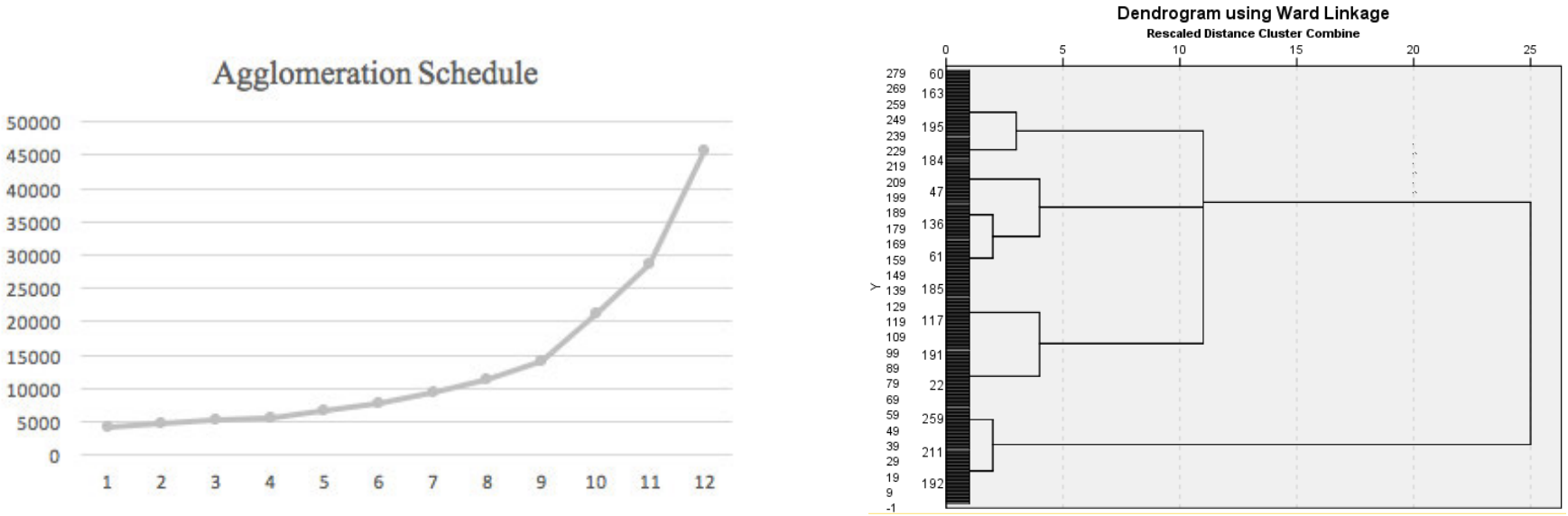


Figure 2.1: Results from the hierarchical cluster analysis. The agglomeration schedule is represented above in graphical form and indicated a four cluster solution. The Dendrogram using Ward Linkage also indicates a four cluster solution.

A K-means cluster analysis was then conducted forcing a four cluster solution, which clustered each participant into one of the four clusters, determining the participant's cluster membership. The number of participants in each cluster is as follows: 75 for the Pure PS subtype, 73 for Pure PC, 57 were non-perfectionists, and 75 were mixed perfectionists. The cluster centres for each of the subtypes can be found in Table 2.1 and represented in Figure 2.2. The clusters also indicate that they are generally following the same pattern mapped out by the 2x2 model, confirming hypothesis 2.

Table 2.1.

Means, standard deviations, and z-scores of perfectionistic concerns and perfectionistic strivings by cluster group

Cluster	Subtype	*n*	Perfectionistic Concerns	PC Z-Score	Perfectionistic Strivings	PS Z-Score
1	Pure PS	75	24.99 (4.88)	-.85	44.95 (4.42)	.26
2	Pure PC	73	37.37 (4.10)	.48	40.00 (4.51)	-.30
3	Non-perfectionism	57	24.56 (5.05)	-.89	30.51 (5.26)	-1.38
4	Mixed perfectionism	75	42.68 (5.81)	1.05	52.16 (3.67)	1.08

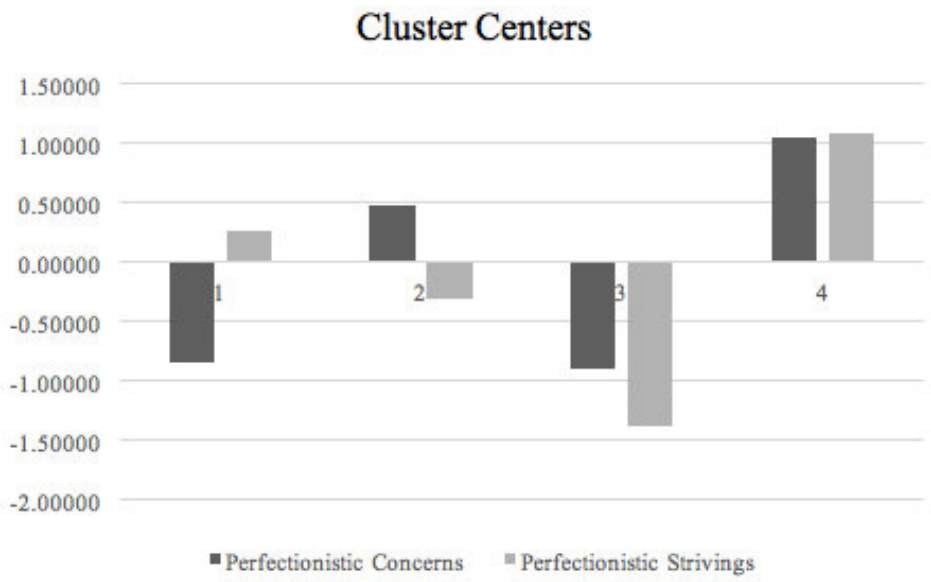


Figure 2.2: Graphical representation of the perfectionism profiles for each cluster. 1 represents Pure PS (low concerns, high strivings), 2 represents Pure PC (high concerns, low strivings), 3 represents non-perfectionists (low concerns, low strivings), and 4 represents mixed perfectionists (high concerns, high strivings).

MANOVAs

Descriptive statistics and correlations can be found in Table 2.2. For both the working week and vacation week, preliminary assumption testing was conducted to ensure that there were no violations of the assumptions of normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity, with no serious violations noted for both the working and vacation weeks. Additionally, to reduce the likelihood of having Type 1 Errors with six outcome variables, the alpha significance was adjusted to .0083 throughout the analyses (p = .05 divided by 6; Pallant, 2013).

Table 2.2

Means, standard deviations, and correlations between study variables.

	Mean (SD)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Subtype																	
(2) Age	40.24 (10.53)	-.16*															
(3) Gender°	1.85 (.36)	.16*	0.02														
(4) Neuroticism	6.00 (1.81)	.39*	-.12*	.19*													
(5) Conscientiousness	8.50 (1.28)	-0.03	.14*	.14*	0.04												
(6) WW EE	19.65 (5.95)	.27*	-.17*	0.12	.30*	0.09											
(7) VW EE	14.98 (6.31)	.19*	0.01	0.02	.18*	-0.02	.56*										
(8) WW Cynicism	9.18 (3.83)	.28*	-.20*	0.09	.31*	0.03	.72*	.48*									
(9) VW Cynicism	7.43 (3.47)	.14*	-0.03	0.08	.17*	-0.03	.51*	.78*	.57*								
(10) VW Enthusiastic	10.89 (3.17)	-.13*	.16*	-0.03	-.21*	0.10	-.38*	-.26*	-.41*	-.29*							
(11) VW Enthusiastic	13.79 (3.37)	0.01	0.02	0.01	-.18*	.21*	0.001	-.21*	-0.05	-.19*	.33*						
(12) WW Comfort	4.61 (1.70)	-.34*	.14*	-.15*	-.32*	-0.09	-.51*	-.24*	-.45*	-.25*	.47*	.16*					
(13) VW Comfort	7.44 (1.88)	-0.10	-0.002	-0.04	-.24*	0.10	-0.01	-.26*	-0.06	-.23*	.17*	.64*	.14*				
(14) WW Anxious	9.04 (2.98)	.33**	-.19*	0.09	.39*	0.04	.64*	.42*	.51*	.40*	-.28*	-0.05	-.53*	-0.03			
(15) VW Anxious	5.40 (2.45)	0.12	-0.04	0.09	.22*	-0.11	.14*	.38*	0.10	.27*	-0.07	-.38*	-0.11	-.58*	.21*		
(16) WW Depressed	8.16 (4.14)	.23*	-.24*	.13*	.32*	0.03	.55*	.40*	.59*	.46*	-.43*	-0.07	-.47*	-0.10	.60*	.24*	
(17) VW Depressed	5.70 (2.69)	0.09	-0.10	0.12	.13*	-.14*	.22*	.39*	.23*	.39*	-.19*	-.45*	-.17*	-.56*	.21*	.68*	.42*

Note: WW = Working Week. VW = Vacation Week. *Correlation is significant at the .05 level (2-tailed). **Correlation is significant at the .01 level (2-tailed). °Male = 1, Female = 2.

Working Week. For the working week, the number of participants that completed this survey included 67 within the Pure PS group, 70 within the Pure PC group, 52 within the non-perfectionists group, and 73 within the mixed perfectionists group. There was a statistically significant difference between the subtypes of perfectionism on the combined dependent variables, F (18, 704.8) = 3.05, p<.001; Wilks' Lambda = .81; partial eta squared = .07. When the results for the dependent variables were considered separately, cluster membership was an indicator for significant differences for all dependent variables except for enthusiasm. Significant between-group differences were found on the following dependent variables: emotional exhaustion F (3, 254) = 9.64, p < .001; partial eta squared = .10, cynicism F (3, 254) = 10.47, p < .001; partial eta squared = .11, comfort affect F (3, 254) = 7.60, p < .001; partial eta squared = .08, anxious affect F (3, 254) = 9.04, p < .001; partial eta squared = .10, and depressed affect F (3, 254) = 4.43, p = .005; partial eta squared = .05. Results can be found in Table 2.3. Additionally, for the dependent variables that indicated a significant difference for cluster membership, further pairwise comparisons were performed. Separate One-Way ANCOVAs were conducted to determine statistically significant differences between the subtypes of perfectionism on each wellbeing measure, while still controlling for age, gender, neuroticism, and conscientiousness.

First, a One-Way ANCOVA was performed to compare the subtypes on emotional exhaustion during the working week. It was found that there was a significant difference between the subtypes and emotional exhaustion [F (3, 255) = 9.02, p < .001]. Post-hoc analysis using Bonferroni adjustments showed that Pure PS (M = 16.72, SD = .70) reported lower emotional exhaustion than Pure PC (M = 21.88, SD = .66) and mixed perfectionists (M = 20.69, SD = .69). However, there

was no significant difference between Pure PS and non-perfectionists (M = 19.16, SD = .78).

Second, a One-Way ANCOVA to compare the subtypes on cynicism during the working week found that there was a significant difference between the subtypes in mean cynicism [F (3, 256) = 10.23, p < .001]. Post-hoc analysis using Bonferroni adjustments showed that Pure PS (M = 7.32, SD = .45) reported lower cynicism than Pure PC (M = 10.58, SD = .42) and mixed perfectionists (M = 10.13, SD = .44). But, Pure PS was not significantly different from non-perfectionists (M = 8.49, SD = .50).

Third, a One-Way ANCOVA was conducted to compare the subtypes on comfort affect during the working week. It was found that there was a significant difference between the subtypes in mean comfort affect [F (3, 256) = 7.35, p < .001]. Post-hoc analysis using Bonferroni adjustments showed that Pure PS (M = 5.43, SD = 20) reported higher comfort affect than Pure PC (M = 4.34, SD = .19) and mixed perfectionists (M = 4.10, SD = .20), but was not significantly different from non-perfectionists (M = 4.64, SD = .23).

Fourth, the One-Way ANCOVA to compare the subtypes and anxious affect during the working week found that there was a significant difference between the subtypes and mean anxious affect [F (3, 255) = 8.95, p < .001]. Post-hoc analysis using Bonferroni adjustments showed that Pure PS (M = 7.52, SD = .34) reported lower anxious affect than Pure PC (M = 9.81, SD = .32) and mixed perfectionists (M = 9.75, SD = .34). However, there was no significant difference between Pure PS and non-perfectionists (M = 8.89, SD = .38).

Lastly, a final One-Way ANCOVA compared the subtypes on depressed affect during the working week. It was found that there was a significant difference between the subtypes and mean depressed affect [F (3, 256) = 4.29, p = .006]. Post-

hoc analysis using Bonferroni adjustments showed that Pure PS (M = 6.98, SD = .50) reported lower depressed affect than Pure PC (M = 9.18, SD = .46) and mixed perfectionists (M = 8.90, SD = .49). However, Pure PS was not significantly different from non-perfectionists (M = 7.40, SD = .55)

Vacation Week. For the vacation week, the number of participants that completed this survey include 62 within the Pure PS group, 65 within the Pure PC group, 51 within the non-perfectionists group, and 67 within the mixed perfectionists group. There was a statistically significant difference between the subtypes of perfectionism on the combined dependent variables, F (18, 656.68) = 1.74, $p<.05$; Wilks' Lambda = .88; partial eta squared = .04. When the results for the dependent variables were considered separately, cluster membership was an indicator for significant differences for emotional exhaustion and cynicism, but not for any of the affective wellbeing measures. Significant differences were found for emotional exhaustion F (3, 237) = 5.90, p = .001; partial eta squared = .07 and cynicism F (3, 237) = 5.11, p = .002; partial eta squared = .06. Results can be found in Table 2.4. Additionally, just as what was done for the working week analysis, the dependent variables that indicated a significant difference for cluster membership were run through further pairwise comparisons. Specifically, One-Way ANCOVAs were conducted to determine statistically significant differences between the subtypes of perfectionism on emotional exhaustion and cynicism, while still controlling for age, gender, neuroticism, and conscientiousness.

First, a One-Way ANCOVA to compare the subtypes on emotional exhaustion during the vacation week found that there was a significant difference between the subtypes and mean emotional exhaustion [F (3, 237) = 5.90, p = .001]. Post-hoc analysis using Bonferroni adjustments showed that Pure PS (M = 12.55,

SD = .83) reported lower emotional exhaustion than Pure PC (*M* = 16.56, *SD* = .78) and mixed perfectionists (*M* = 16.67, *SD* = .82), but was not significantly different from non-perfectionists (*M* = 13.67, *SD* = .90).

Then, another One-Way ANCOVA to compare the subtypes and cynicism during the vacation week was performed. It was found that there was a significant difference between the subtypes and mean cynicism [*F* (3, 237) = 5.11, p = .002]. Post-hoc analysis using Bonferroni adjustments showed that Pure PS (*M* = 5.53, *SD* = .36) reported lower cynicism than Pure PC (*M* = 6.00, *SD* = .33) and mixed perfectionists (*M* = 6.20, *SD* = .35). However, Pure PS was not significantly different from non-perfectionists (*M* = 4.90, *SD* = .39).

Table 2.3

Multivariate analysis of variance for the subtypes of perfectionism and wellbeing during a working week.

Dependent Variable	*df*	*df* error	*F*	Partial Eta Squared	Subtype	Means	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Emotional exhaustion	3	254	9.64*	.102	Pure PS	16.72	15.33	18.11
					Pure PC	21.88	20.58	23.17
					Non-Perfectionism	19.16	17.62	20.69
					Mixed Perfectionism	20.69	19.33	22.05
Cynicism	3	254	10.47*	.110	Pure PS	7.32	6.43	8.21
					Pure PC	10.58	9.75	11.41
					Non-Perfectionism	8.49	7.51	9.47
					Mixed Perfectionism	10.13	9.26	11.01
Enthusiastic affect	3	254	3.41	.039	Pure PS	11.76	10.97	12.55
					Pure PC	9.98	9.24	10.71
					Non-Perfectionism	11.08	10.21	11.96
					Mixed Perfectionism	10.80	10.02	11.58
Comfort affect	3	254	7.60*	.082	Pure PS	5.43	5.03	5.83
					Pure PC	4.34	3.97	4.71
					Non-Perfectionism	4.64	4.20	5.09
					Mixed Perfectionism	4.10	3.70	4.49
Anxious affect	3	254	9.04*	.096	Pure PS	7.52	6.85	8.20
					Pure PC	9.81	9.18	10.44
					Non-Perfectionism	8.89	8.14	9.64
					Mixed Perfectionism	9.75	9.08	10.42
Depressed affect	3	254	4.43*	.050	Pure PS	6.98	6.00	7.96
					Pure PC	9.18	8.26	10.09
					Non-Perfectionism	7.40	6.31	8.48
					Mixed Perfectionism	8.90	7.93	9.86

Note. *= $p < .0083$.

Table 2.4

Multivariate analysis of variance for the subtypes of perfectionism and wellbeing during a vacation week.

Dependent Variable	*df*	*df* error	*F*	Partial Eta Squared	Subtype	Means	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Emotional exhaustion	3	237	5.90*	.069	Pure PS	12.55	10.92	14.19
					Pure PC	16.56	15.04	18.09
					Non-Perfectionism	13.67	11.93	15.43
					Mixed Perfectionism	16.67	15.06	18.28
Cynicism	3	237	5.11*	.061	Pure PS	6.31	5.40	7.21
					Pure PC	8.49	7.65	9.34
					Non-Perfectionism	6.66	5.69	7.64
					Mixed Perfectionism	8.03	7.14	8.92
Enthusiastic affect	3	237	1.26	.016	Pure PS	13.71	12.83	14.58
					Pure PC	13.18	12.36	14.00
					Non-Perfectionism	14.18	13.24	15.12
					Mixed Perfectionism	14.16	13.29	15.02
Comfort affect	3	237	.68	.008	Pure PS	7.42	6.93	7.92
					Pure PC	7.48	7.01	7.94
					Non-Perfectionism	7.74	7.21	8.28
					Mixed Perfectionism	7.20	6.71	7.68
Anxious affect	3	237	1.35	.017	Pure PS	5.27	4.63	5.91
					Pure PC	5.51	4.91	6.11
					Non-Perfectionism	4.86	4.16	5.55
					Mixed Perfectionism	5.83	5.20	6.46
Depressed affect	3	237	2.29	.028	Pure PS	5.53	4.83	6.23
					Pure PC	6.00	5.34	6.66
					Non-Perfectionism	4.89	4.13	5.65
					Mixed Perfectionism	6.19	5.50	6.88

Note. *= $p < .0083$.

Discussion

The first aim of this research was to explore the within-person combinations of perfectionistic strivings and perfectionistic concerns, to see how they organise themselves within the sample of school teachers. Specifically, this research explored the number of subtypes of perfectionism present in order to directly test whether the tripartite or 2x2 model of perfectionism was the best fit model. It was found that a four cluster solution was a better fit compared to a three cluster solution, indicating that the 2x2 model of perfectionism was the best representation of the within-person combinations of perfectionism within this sample, confirming hypothesis 1.

With the number of clusters determined, the second aim was to investigate the different parameters or levels of perfectionistic strivings and perfectionistic concerns in each cluster. This allowed us to see whether the data-driven parameters, either high or low levels of perfectionistic strivings and concerns, match those that the theoretical model suggests. It was found that the clusters generally followed the same pattern mapped out by the 2x2 model, confirming hypothesis 2. The non-perfectionist subtype had low levels of both perfectionistic strivings and concerns, whereas the mixed perfectionist subtype had high levels of both perfectionism dimensions. The Pure PS subtype had high levels of perfectionistic strivings and low levels of perfectionistic concerns, as well as the Pure PC subtype had high levels of perfectionistic concerns and low levels of perfectionistic strivings. The parameters of each subtype can be found in Table 2.1 and Figure 2.2.

With the subtypes established, the next aim was to explore how being a member of each subtype impacts the school teachers' wellbeing, in the form of work-related burnout and context-free positive and negative affect. In particular, the aim was to explore whether perfectionism's impact on wellbeing is present during

a working week and if it has the same effect during a vacation week for each subtype of perfectionism. The findings showed that during the working week, there was a statistically significant difference between the subtypes of perfectionism for emotional exhaustion, cynicism, comfort, anxious, and depressed affect, but no difference in enthusiasm. Specifically, it was found that those in the Pure PS subtype had significantly lower emotional exhaustion, cynicism, anxious and depressed affect, as well as higher comfort during the working week compared to mixed perfectionists (confirming hypothesis 6) and Pure PC. However, the Pure PS was not significantly different from non-perfectionists (rejecting hypothesis 3). The findings did not show any differences between Pure PC and non-perfectionists or mixed perfectionists, therefore rejecting hypotheses 4 and 5.

It was found that during the vacation week, there was a statistically significant difference between the subtypes of perfectionism for emotional exhaustion and cynicism, but not for enthusiasm, comfort, anxious, and depressed affect. Specifically, it was found that those in the Pure PS group had significantly lower emotional exhaustion and cynicism compared to mixed perfectionists and Pure PC, however they were not significantly different from non-perfectionists. During the vacation week, perfectionism was not activated in terms of affective wellbeing, therefore there were no significant differences between the subtypes of perfectionism on the measures of both positive and negative affect. Which suggests that perfectionism was acting as a diathesis for context-free affective wellbeing, partially confirming hypothesis 7. However, there were differences between burnout measures during the vacation week for the subtypes of perfectionism, which partially rejects hypothesis 7. Whether perfectionism works as a diathesis during a vacation period is still unclear.

Theoretical Contributions

The results from this research highlight three main theoretical contributions. First, the research found that the 2x2 model of perfectionism is a better fit model for the combination or subtypes of perfectionism compared to the tripartite model of perfectionism. Second, the results suggest that being low in perfectionistic concerns may be the 'adaptive' side of perfectionism, as opposed to being high in perfectionistic strivings. Third, the results found support for the diathesis-stress model, due to perfectionism being not as strongly activated during the vacation week compared to the working week. However, support was only found for the measures of affective wellbeing and not for the measures of burnout.

First, when testing the fit of the tripartite model of perfectionism versus the fit of the 2x2 model of perfectionism, it was found that the 2x2 model was a better fit for the school teachers. The use of hierarchical cluster analysis allowed for an investigation into this sample's number of clusters, specifically how the teachers' levels of perfectionistic strivings and concerns are organised within these participants. This allowed for a direct testing of the best fit model, without forcing a predetermined number of clusters onto the data (Hair et. al., 2010; also see Li et al., 2014). The results show a data-driven conceptualisation of the subtypes of perfectionism, which fit the theory of four subtypes within the 2x2 model and not the theory of three subtypes within the tripartite model.

Furthermore, previous researchers have argued that the 2x2 model of perfectionism may not add any substantial value to the understanding of perfectionism (Rice, Ashby, & Gilman, 2011). However, the 2x2 model's distinction between Pure PC and non-perfectionist subtypes, as opposed to the tripartite model including all those low in perfectionistic strivings as non-perfectionists, adds value

to the understanding of the interaction between perfectionistic strivings and concerns (Gaudreau & Thompson, 2010). The current study's findings showed that it was the Pure PC subtype that seemed to function similarly to the mixed perfectionism subtype, as opposed to the non-perfectionism subtype that the tripartite model would suggest. This implies that the levels of perfectionistic concerns may be more influential to the model than the levels of perfectionistic strivings, which directly contradicts the tripartite model of perfectionism. Furthermore, the distinction between Pure PC and non-perfectionism within the 2x2 model has previously been found to have support within other samples (see Franche, Gaudreau, & Miranda, 2012; Gaudreau & Thompson, 2010; Li et al., 2014; Sironic & Reeve, 2012).

Second, the results of this research also suggest that being low in perfectionistic concerns may be the 'adaptive' side of perfectionism, as opposed to being high in perfectionistic strivings. When examining the different subtypes of perfectionism and wellbeing, there appears to be a pattern in the findings that suggests that having high amounts of perfectionistic concerns is detrimental to employee burnout and affective wellbeing. Specifically, it was found that the Pure PS subtype had lower burnout and negative affect (and higher positive affect) than the Pure PC subtype and the mixed perfectionists subtype. Both of the subtypes with elevated levels of perfectionistic concerns were displaying maladaptive relationships with wellbeing. Additionally, the findings showed that there were no significant differences between the Pure PC subtype and the mixed perfectionist subtype, which contradicted the fifth hypothesis. The 2x2 model suggests that the high levels of perfectionistic strivings in the mixed perfectionism subtype would 'buffer' or be used as a defence from the high levels of perfectionistic concerns. This research did not find buffering effects within the mixed perfectionism subtype, implying that the

high levels of perfectionistic concerns were more impactful than the levels of perfectionistic strivings.

The non-perfectionist subtype was found to not be significantly different from any of the other subtypes, suggesting this subtype's wellbeing measures fell around the middle or in-between the other subtypes. The Pure PS subtype was shown to have better wellbeing during the working week and vacation week, which could be accounted for by the higher levels of perfectionistic strivings within this subtype. The high levels of perfectionistic strivings in the Pure PS subtype did significantly differentiate it from the Pure PC and mixed perfectionist subtypes, which the non-perfectionists subtype was not. However, the Pure PS subtype did not significantly differ from the non-perfectionists with low levels of perfectionistic strivings, contrary to prediction. This suggest that the adaptiveness lies in the lower levels of perfectionistic concerns. Perhaps the higher levels of perfectionistic strivings added to the adaptiveness of low levels of perfectionistic concerns, which set the Pure PS subtype apart from the mixed perfectionists and Pure PC subtypes. These findings highlight that the destructive characteristics of perfectionistic concerns can have detrimental effects on employees' wellbeing (see Harari et al., 2018; Ozbilir, Day, & Catano, 2014). It appears that having low amounts of that fear of mistakes and having high personal standards could benefit employees, even with some perfectionistic tendencies.

The third and final theoretical contribution from this research is that the results found support for the diathesis-stress model for perfectionism and affective wellbeing. Perfectionism has been theorised to be more or less salient, depending on the environment, and has been reported to be the most salient within the workplace (Dunkley et al., 2003; Harari et al., 2018). For affective wellbeing, this finding is

consistent with the view that perfectionism has a vulnerability when work-related stressors are present. During the working week, perfectionism was interacting with work-related stressors, specifically the interpersonal, performance, and achievement-related stressors that are present within the workplace (Harari et al., 2018). These stressors were not present during the vacation, so perfectionism remained relatively 'dormant.' This is an encouraging finding, and suggests that perfectionistic employees can obtain benefits to their affective wellbeing during times away from work (also see Flaxman et al., 2012).

However, the findings did not find support for the diathesis-stress model for perfectionism and measures of burnout, both emotional exhaustion and cynicism. The results showed that there were still significant differences between the subtypes of perfectionism during the vacation week. Previous findings have linked multidimensional perfectionism to burnout (see Hill & Curran, 2016; Moate et al., 2016; Stoeber & Rennert, 2008), but there lacks any evidence on how perfectionists are able to recover from burnout. The results may suggest that the differences between the subtypes of perfectionism remained during the vacation because recovering from emotional exhaustion and cynicism requires more time than a one-week respite from work. Furthermore, those experiencing elevated burnout have depleted their physical, cognitive, and emotional energy resources, therefore are unequipped to deal with any further effort that might be required of them during a respite (Oerlemans & Bakker, 2014). Perhaps perfectionistic thoughts and behaviours were not being activated during this respite, but because of perfectionism's relationship with burnout during working periods, the consequences are still felt during periods outside of work. Perfectionism impacts employees' burnout during working periods, and the subtypes of perfectionism with higher

emotional exhaustion and cynicism continued to experience the depleted energy resources during the respite.

Methodological Contributions

This research project made methodological contributions by being the first to investigate the within-person combinations of perfectionism and school teachers' wellbeing during a working week and a vacation week. Most previous research into perfectionism, especially the within-person combinations of perfectionism, has utilised one multidimensional perfectionism scale; however, by including both the MPS (Hewitt & Flett, 1991b) and the FMPS (Frost et al., 1990) when exploring the within-person combinations allowed for a further understanding of how the two higher-order perfectionistic strivings and concerns organise themselves within individuals. Furthermore, the use of both hierarchical and non-hierarchical cluster analyses to investigate the subtypes of perfectionism allowed for a thorough investigation into the number of perfectionism subtypes, as well as determining the levels of the two dimensions in each subtype.

Further contributions include the use of both work-related and context-free measures of positive and negative affect, which allowed for a comparison into discrete affective states. Most researchers have only examined either positive or negative outcomes within each research study, whereas including both gave a fuller picture into the possible adaptiveness and mal-adaptiveness of multidimensional perfectionism. Additionally, by examining both a working period and a non-working period, this research was able to directly test the diathesis-stress model within the subtypes of perfectionism, and compare the differences between the various wellbeing measures. This also gave us the opportunity to discover the benefits a vacation brings to the subtypes of perfectionists, which until now was not explored.

Limitations and Directions for Future Research

Limitations to this research should also be considered. This research examined this sample of teachers' experience of a working week and a week-long half-term vacation; therefore, these findings may not be generalisable to other occupational groups or to other lengths of vacation (Flaxman et al., 2012; Kühnel & Sonnentag, 2011). Additionally, since the number of clusters that were established and each cluster's parameters (levels of perfectionistic strivings and concerns) were data-driven, the results could vary across different samples. Therefore, it is hoped that this research is repeated with differing occupational groups and with different lengths of vacations, which will allow for more confidence when drawing conclusions.

Furthermore, it is recommended that future research continues to explore whether the tripartite or the 2x2 model of perfectionism fits the data-driven model of perfectionism better, instead of forcing one model on the data. Specifically, future researchers should continue to use both hierarchical and non-hierarchical cluster analyses to allow the number of clusters and cluster parameters to be determined within the analyses. Additionally, continuing to explore the parameters of the established subtypes of perfectionism will add to the growing literature on the tripartite and 2x2 model of perfectionism. It is hoped that the more research that is conducted within the area will bridge any gaps between the data-driven subtypes and the theoretical subtypes within each model. Lastly, further research should continue to investigate individual differences, particularly multidimensional perfectionism and its within-person combinations as possible predictors for the variance in employees' health and wellbeing.

Practical Implications

First, these findings highlight the value of exploring the subtypes of perfectionism within a working population. It has been suggested that everyone has varying levels of both higher-order dimensions of perfectionism, however perfectionistic strivings and concerns are often explored as continuous variables (Gaudreau & Thompson, 2010; Rice & Ashby, 2007). In doing so, the further exploration into how being high or low in each dimension and how the two dimensions interact within individuals is lost. The current exploration was able to find the subtypes that were more vulnerable to poor wellbeing during a working week and during a vacation, which were Pure PC and mixed perfectionists. Without investigating the within person combinations, there would not have been a recognition of mixed perfectionists as being a vulnerable subtype, because the high levels of perfectionistic strivings could indicate they are associated with more positive outcomes. The utilisation of the 2x2 model of perfectionism within organisations, where perfectionistic tendencies are often valued, would identify those who are able to strive for high personal standards and benefit from it, while also identifying those who may be suffering due to their perfectionistic thoughts and behaviours.

Additionally, these findings also show how significant a vacation is for teachers' affect wellbeing, particularly for enhancing feelings of comfort, and lessening the feelings of anxiety and depression. The vacation period was especially important for those with higher levels of perfectionistic concerns. In an effort to reduce the negative aspects that are associated with higher levels of perfectionistic concerns during working and non-working periods, interventions such as cognitive behavioural therapy and mindfulness-based training programmes have been found to

be helpful (Lloyd et al., 2015; Wimberley, Mintz, & Suh, 2016). Particularly, these interventions would be especially beneficial if they focused on reducing the harmful thoughts that are central to perfectionistic concerns, such as feeling like they need to be perfect for others and fearing making a mistake. Furthermore, previous research has found that problem-focused coping reduces the negative effects of perfectionistic concerns in Pure PC and mixed perfectionist subtypes on their work-related wellbeing. It was suggested that in clinical practice, it would be helpful for those within the Pure PC and mixed perfectionist subtypes to be assisted in more problem-solving coping strategies, both behaviourally and cognitively (Li et al., 2014).

Conclusion

Despite the growing interest in the interaction between and combinations of multidimensional perfectionism, there is still little understanding of the way in which perfectionism is organised within individuals and how this impacts their wellbeing. This study tested the within-person combination of perfectionistic strivings and concerns and the relationship to school teachers' wellbeing during a working week and during a vacation week. This research supported the use of the 2x2 model of perfectionism over the tripartite model when exploring the subtypes of perfectionism. Additionally, it was found that during a working week, there were significant differences between the subtypes of perfectionism for burnout, positive affect, and negative affect. However, during the vacation week, there was only significant differences between the subtypes of perfectionism and burnout, not affective wellbeing. It is hoped that the findings will further research into the within-person combinations of perfectionistic strivings and concerns, as well as expand the literature on individual differences in employees' health and wellbeing.

Chapter 5: Multidimensional perfectionism and psychophysiological recovery: Does worry and rumination moderate the relationship between perfectionism and evening wellbeing?

Introduction

The ability to recover from work-related stress has been established as an important factor for maintaining employees' daily and long-term emotional and physical health. The inability to de-stress and recover in the evening after work keeps the psychophysiological systems activated for a prolonged period, which over time increases the risk of psychological and physical ill-health (Brosschot, Gerin, & Thayer, 2006; Geurts & Sonnentag, 2006; McEwen, 1998). Previous research indicates that the ability to detach from work in the evening is positively related to employee wellbeing (Sonnentag, 2012). However, the inability to detach from work, either physically by continuing to work or psychologically by continuing to think about job-related matters in the evening, has been found to be associated with burnout and low life satisfaction (Sonnentag & Fritz, 2015). Most of the research in this area has focused on the influence of job characteristics on detaching from work, but recently the role of personality characteristics has begun to receive some empirical attention (Flaxman et al., 2012; 2018; Sonnentag & Fritz, 2015).

One personality characteristic or trait that has been linked to being unable to detach in the evening is perfectionism (Flaxman et al., 2018). Perfectionism is considered a maladaptive personality trait (Flett & Hewitt, 2002), although some researchers suggest that certain aspects of perfectionism could be adaptive (Enns & Cox, 2002). The more maladaptive aspects of perfectionism are known as perfectionistic concerns, while the more adaptive aspects of perfectionism are known as perfectionistic strivings (Stoeber & Rennert, 2008). Research exploring

perfectionism and evening recovery found that perfectionistic concerns were linked to poor recovery, specifically poor subjective sleep quality as well as poor work day functioning the following day. Whereas, perfectionistic strivings were related to next-day work engagement (Flaxman et al., 2018).

The perfectionism cognition theory posits that current cognitive processes are linked to perfectionism, which in turn effects perfectionist's recovery and overall wellbeing (Flett, Hepon, & Hewitt, 2015). This theoretical model highlights worry and rumination as two forms of perseverative cognition that directly impact perfectionists and their wellbeing. Previous findings suggest that perfectionist's evening wellbeing is mediated by the tendency to worry and ruminate, however there lacks any investigation into whether the relationship between perfectionism and evening wellbeing is moderated by worry and rumination. Both dimensions of perfectionism have been linked to worry and rumination (Flett, Hepon, & Hewitt, 2015; Xie et al., 2019), but it is unclear how the relationship to wellbeing changes when they worry and ruminate in the evening and when they do not.

The purposed research project will investigate multidimensional perfectionism's relationship with employee's emotional and physical wellbeing in the evening and will explore whether the relationship changes as a function of evening worry and rumination. This research aims to explore employee's wellbeing over the course of two evenings, including during the leisure periods after work has finished and during the sleeping periods. Within these periods, measures of heart rate variability (HRV) will be used as an objective indication of sympathetic and parasympathetic activity during non-working periods. Additionally, measures of emotional wellbeing in the form of both positive and negative affect will be used to record subjective wellbeing in the evening, and subjective sleep quality will

be recorded in the morning after each sleeping period. Lastly, this research will explore whether worrying and ruminating moderates the relationship between multidimensional perfectionism and employee's subjective and objective wellbeing.

Theories on Evening Recovery from Work-Related Stress

Within the workplace, there are many different stressors that may be present; which includes, but is not limited to, pressure from management, job insecurity, organisational restructuring, approaching deadlines, new technologies, and countless other examples (Sparks, Faragher, & Cooper, 2001). On a daily basis, jobs require employees to put in varying amounts of effort into the tasks that need to be completed. Whether the responsibility or task is small or large, it requires some amount of effort to be exerted, which in turn may cause strain for the employees' emotional and physical health.

Work-related stress can have long-term effects on employees' psychophysiological health, which is grounded in our biological reactions to stressors. The natural process that organisms use to maintain homeostasis (also called internal stability) is known as allostasis (Tonello et al., 2014). Stressors cause fluctuations to homeostasis, which in turn triggers internal mechanism that attempt to balance and alleviate any damage caused by the stress response. Allostatic load theories (McEwen, 1998) describe that the normal load reactions accompanying daily effort at work, can be alleviated during non-working periods. The alleviation of the stress brought on by daily work demands and effort is known as recovery. Recovery has been found to be essential in order to protect and enhance wellbeing when pressure and job demands are high (Sonnentag & Fritz, 2015). However, if recovery does not occur, the psychophysiological systems remain activated for a prolonged period, leading to continued exposure to stressors, which can be harmful

for individuals' mental and physical wellbeing. Specifically, occupational stress has been suggested to considerably increase the risk for cardiovascular disease (Thayer, Yamamoto, & Brosschot, 2010; Tonello et al., 2015).

Stress recovery research has begun to use a common marker of cardiac health known as heart rate variability (HRV). HRV is the measure of the variation in time intervals between each adjacent heartbeat (Shaffer, McCrafty, & Zerr; 2014). In other words, HRV is the measure of the beat-to-beat variation in heart rate and is widely accepted as a biomarker for sympathetic and parasympathetic nervous system activity (Azam et al., 2015). Psychophysiological stress prompts cardiovascular activation via the autonomic nervous system, and the variation in HRV is used as an indicator of continuous and real-time parasympathetic functioning (Allen, Chambers, & Towers, 2007; Azam et al., 2015; Fabes & Eisenberg, 1997, Taelman et al., 2009). Insufficient parasympathetic functioning, exhibited by reduced HRV, can affect relaxation and result in poor recovery (Brosschot, Gerin, & Thayer, 2006).

An indicator of prolonged psychophysiological activation is whether activation remains responsive into periods absent of the stressor (Brosschot, Van Dijk, & Thayer, 2007). As an extension of the evening recovery period, and arguably the most important recuperative period, sleep signifies a period completely absent of active work-related stressors (Brosschot, Van Dijk, & Thayer, 2007). Sleep is a crucial period of daily recovery and is the most critical natural period for psychological and physical restoration (Brosschot, Van Dijk, & Thayer, 2007). Research into sleep has shown that sleep impairments are predictors of cardiovascular disease, depression, and even mortality (Åkerstedt, 2006). Examining the relationship between work stress, psychophysiological recovery, and sleep

remain important research areas due to their central role in the development and maintenance of many disorders and diseases.

Employee Wellbeing and Multidimensional Perfectionism

Researchers have begun to explore possible individual differences in recovering from work-related stress in the evening and during sleep (see Bakker et al., 2013; Cropley, Plans, Morelli, Sutterlin, Inceoglu, Thomas, & Chu, 2017; Flaxman et al., 2018; Zoccola & Dickerson, 2015). One personality type that has been suggested to impact evening recover is multidimensional perfectionism (Flaxman et al., 2018). Perfectionism is defined as the combination of setting very high standards for oneself, being motivated by the idea of flawlessness, and the tendency to judgmentally evaluate one's own behaviour (Childs & Stoeber, 2010; Hill & Curran, 2016; Stoeber, Edbrooke-Childs, & Damian, 2016; Stoeber & Rennert, 2008). Perfectionism is understood to be a multifaceted or multidimensional personality trait, which allows for explorations into whether there are aspects of perfectionism that might be positive or negative (Childs & Stoeber, 2010: Hill & Curran, 2016; Stoeber & Rennert, 2008).

Perfectionistic concerns have been found to be associated with higher levels of fear, depression, stress, anxiety, and burnout (Moate et al., 2016; Stoeber, Edbrooke-Childs, & Damian, 2016; Stoeber & Rennert, 2008), in addition to lower levels of self and life satisfaction (Flett & Hewitt, 2006). Researchers have found that the perfectionistic concerns dimension is positively associated with stress-related physiological responses including higher blood pressure, heart rate, and lower heart rate variability (Kazemi & Ziaaddini, 2014). Moreover, perfectionistic concerns were found to have a higher heart rate after receiving negative feedback (Besser, Flett, Hewitt, & Guez, 2008). In a study exploring employee perfectionism

and post-work recovery, it was found that perfectionistic concerns were negatively associated with sleep quality and work day functioning (Flaxman et al., 2018).

Perfectionistic strivings have been linked to higher levels of self-confidence, achievement motivation, and sustained goal-directed behaviour (Moate et al., 2016; Stoeber & Rennert, 2008). In exploring perfectionistic strivings and evening recovery, it was found that they were indirectly related to work day engagement through having positive thoughts about work in the evening (Flaxman et al., 2018). Although, there are also findings that show perfectionistic strivings to be neutral or even problematic (see Bielings, Israeli, & Antony, 2004; Dunkley et al., 2000; Enns, Cox, & Borger, 2001; Stoeber & Otto, 2006). Perfectionistic strivings have been found to have enduring heart-rate elevations during and after a stressful task, indicating an increase in energy used to meet extremely high personal standards (Flynn, 1996).

The first aim of this research is to explore the relationship between the two dimensions of perfectionism with subjective and objective measures of wellbeing in the evening after work and during sleep. Following the findings from previous research that links perfectionistic concerns to poorer psychophysiological wellbeing, it is hypothesised that perfectionistic concerns will exhibit the 'mal-adaptive' side of perfectionism. This will be represented by being associated with poorer wellbeing in the evening and during sleep, overall indicating poorer recovery from daily workplace stress. Following the previous findings that have linked perfectionistic strivings to more adaptive psychological processes and wellbeing, it is hypothesised perfectionistic strivings will exhibit the 'adaptive' side of perfectionism. This will be represented by being associated with better wellbeing in the evening and sleep, overall indicating better recovery from daily workplace stress.

Hypothesis 1. Perfectionistic concerns will be positively related to feeling anxious in the evening (a), and will be negatively related to feeling enthusiastic (b), evening HRV (c), nocturnal HRV (d) and subjective sleep quality (e).

Hypothesis 2. Perfectionistic strivings will be negatively related to feeling anxious in the evening (a), and will be positively related to feeling enthusiastic (b), evening HRV (c), nocturnal HRV (d) and subjective sleep quality (e).

The Perfectionism Cognitive Theory and the Diathesis-Stress Model

Going beyond multidimensional perfectionism's associations with wellbeing indicators, researchers have begun to uncover cognitive mechanisms and behaviours explain the link between perfectionism and health outcomes. The perfectionism cognition theory (Flett, Nepon, & Hewitt, 2016), was developed to be the theoretical backing for the underlying cognitive mechanism, processes, and outcomes that accompany or are associated with multidimensional perfectionism. Specifically, the theory focuses on worry and rumination as comparable forms of cognitive perseveration that prolong the activation of emotional and physical distress within perfectionists (Flett, Nepon, & Hewitt, 2016).

A central theme of the perfectionism cognition theory explains that both perfectionistic concerns and strivings would be associated with worry and rumination. The perfectionism cognition theory suggests that worry and rumination mediates the relationship between perfectionism and health outcomes. Previous research has found that perfectionistic concerns has been linked to worry and rumination during non-working periods, which was found to cause greater deterioration in wellbeing (Flaxman et al., 2012). Additionally, perfectionistic concerns have also been associated with poorer work day functioning and sleep quality via the tendency to worry and ruminate about work. Perfectionistic strivings

were associated with work day engagement due to the tendency to think positively about work during non-work periods, and was not uniquely related to worry and rumination (Flaxman et al., 2018). The evidence seems to support worry and rumination as underlying mechanisms for perfectionistic concerns, however it remains unclear whether worry and rumination function the same for perfectionistic strivings. Additionally, previous researchers have explored cognitive perseveration as a mediator between perfectionism and health outcomes, however there lacks any exploration into whether cognitive perseveration moderated this relationship. Perhaps worrying and ruminating reduces or amplifies the relationship between multidimensional perfectionism and wellbeing, as opposed to being the underlying mechanism behind the relationships.

In the evening after work, without the presence of work-related stressors, perfectionism should remain dormant. In other words, it has been proposed that perfectionism functions as a diathesis (Flett et al., 1995). However, worrying about an upcoming stress or ruminating about a past stress will function as a stressor during the evening, even if the stressor is not actually present at that time. Worry and rumination would be cognitive representations of a stressor, which would then trigger the perfectionism diathesis. In this case, perfectionism would be activated, as a result of the act of worrying and ruminating, which would then have detrimental effects on evening wellbeing and recovery. This relationship would only be activated *when* perfectionists worry and ruminate. If perfectionists did not worry or ruminate in the evening, then perfectionism would remain inactive without the presence of any stressors. Thus, it is proposed that worry and rumination function as the moderator between multidimensional perfectionism and evening emotional and physical wellbeing. Specially, it is hypothesised that worry and rumination will

exacerbate the relationship between perfectionistic concerns and poorer wellbeing in the evening and during sleep, thus worsening the recovery experience. It is then hypothesised that worry and rumination will nullify the positive relationship perfectionistic strivings has with wellbeing in the evening and during sleep. Worrying and ruminating in the evening will also contribute to a worsened recovery experience for perfectionistic strivings.

Hypothesis 3. Worry and rumination will moderate the relationship between perfectionistic concerns and anxiety (a), enthusiasm (b), evening HRV (c), nocturnal HRV (d), and subjective sleep (e). The relationship will be intensified leading to poorer recovery in the evening and during sleep.

Hypothesis 4. Worry and rumination will moderate the relationship between perfectionistic strivings and anxiety (a), enthusiasm (b), evening HRV (c), nocturnal HRV (d), and subjective sleep (e). The relationship will weaken leading to poorer recovery in the evening and during sleep.

Method

Participants

Participants were 51 employees from various sectors and organisations located in London, United Kingdom. In order to take part in the research, participants had to be employed either part-time or full-time and had to be between the ages of 18 and 60. We were interested in working adults, however we excluded anyone over the age of 60, due to the impact age has on HRV (Shaffer, McCraty, & Zerr, 2014). Similarly, we excluded anyone who had a diagnosed illness that affects their heart or those who were currently taking medication that impacts their heart functioning, as well as anyone who was pregnant or breast-feeding. Of the 51 employees that passed all the exclusion requirements, 38 were female and 13 were

male. The age of participants ranged from 23 to 59 and hade an average age of 34.2 (SD = 9.5). Additionally, 48 of the participants worked full-time and 3 worked part-time, with a total of 35 having a non-managerial role, 14 being in a mid-level managerial or leadership position, and 2 having a senior leader role.

Design and Procedure

36 hour HRV design. The main research period, when participants were wearing the heart rate monitor, lasted roughly 36 hours which began at the end of one working day, included the whole next working day, and then concluded the following morning. The research period either took place the evening of a Monday and lasted until Wednesday morning, or began Wednesday evening and lasted until Friday morning. This design allowed for two measures of evening HRV, after the two consecutive working periods, and for HRV during two nights' sleeps. We used two consecutive evenings and averaged the scores from these periods, to ensure that the nights we were investigating represented a typical working day, instead of one particularly stressful day. Lastly, we had the participants continue to wear the monitors during their working days for a future research project exploring HRV during a working period.

Procedure. Participants were recruited via word-of-mouth and through various social media platforms (e.g., Facebook, LinkedIn, and Twitter). A research period was then arranged with the participants, which included meeting with the researcher in the evening of the first day and the morning of the third day, either within their workplace or within City, University of London. Prior to meeting with the researcher, an initial survey was sent out a week before the research period. Within this survey the perfectionism measures were included, as well as information that is required when setting up the heart rate monitors (e.g., height, weight, age,

gender, etc.). The monitors were set up for each individual participant prior to the first meeting.

During the first meeting, the researcher explained the research as well as demonstrated how to wear the heart rate monitors. The monitors used were Actiheart monitors (CamNTech) and included the use of a chest strap, rather than stick-on electrodes. The participants were instructed on how to properly wear the monitors, as well as how to remove, adjust, and put them back on. Participants were also given a participant guide (see Appendix) that summarised the instructions again, to ensure the monitors were worn properly. The researcher instructed participants to continue to wear the monitor until it was collected on the third day. They were only instructed to remove the monitor to re-adjust, or when coming in contact with water (i.e., showering, bathing, or swimming). At the end of the research period, participants met with the researcher again to return the heart rate monitors and discuss any concerns they might have had.

During this time period, participants were also asked to complete 6 surveys. Two surveys were to be completed in the evenings one hour before bed, to reflect back on the leisure period after work. Two surveys were to be completed as soon as possible upon awakening, to evaluate their sleep quality. Then, two surveys were to be completed at the end of each working day, to reflect back on their working period. The working period surveys were not used for this study. Additionally, since each of these timings are unique for each participant, they were asked the timings for when each survey should be sent (e.g., when they typically finish work, fall asleep, and wake up). The surveys were sent online using Qualtrics and were sent to their emails at the timings they indicated. Text message reminders were also offered, which corresponded for each of the survey timings. Finally, in return for their

participation, participants were given a personalised report with their heart rate data information, which included recommendations on increasing their wellbeing. An example of the personalised report can be found in the Appendix.

Scale Measurements

Perfectionism. Perfectionism was measured using the short-form Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991b) and the short-form Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990; also see Cox, Enns, & Clara, 2002). The short-form MPS includes five items that measure self-oriented perfectionism (SOP; Cronbach's alpha of .88) and five items that measure socially-prescribed perfectionism (SPP; Cronbach's alpha of .83) and the items were presented on a seven-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). The short-form FMPS includes five items that measure concerns over mistakes (CM; Cronbach's alpha of .85), three items that measure doubts about actions (DA; Cronbach's alpha of .77), and five items that measure personal standards (PS; Cronbach's alpha of .77). The items were presented on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). We followed the measurement testing that was performed in Chapter 3 to inform the use of the two perfectionism scales.

Affective Wellbeing. To include measures of both high activation positive (enthusiasm) and negative (anxious) affective wellbeing, we used the four-quadrant model of affective wellbeing to distinguish the different measures from Warr's (1990) Affective Well-Being scales (also see Daniels et al.,1997; Mäkikangas, Feldt, & Kinnunen, 2007). Participants were asked 'This evening I felt...' for each of the emotions and responses were given on a five-point Likert scale ranging from 1 (Not at all) to 5 (Extremely). The items used to measure enthusiasm affect were 'full of

energy,' 'delighted,' 'cheerful,' and 'happy.' Cronbach's alpha for the first evening was .86 and for the second evening was .88. The items used to measure anxious affect were 'uneasy,' 'anxious,' 'tense,' and 'afraid.' Cronbach's alpha for the first evening was .77 and for the second evening was .87.

Worry and Rumination. Worry and rumination was measured both evenings using three items adapted for the day level from the perseverative cognition scale developed by Flaxman and colleagues (2012; also see Flaxman et al., 2018). The three items included 'I worried about things I need to do at work'; 'I worried about how I would deal with a work task or issue'; and, 'My thoughts kept returning to a stressful situation at work'. Participants were asked to rate the extent to which they had experienced such thoughts during each evening, since leaving work. The response scale ranged from 1 (not at all) to 5 (a great deal). Cronbach's alpha for the first evening was .88 and was .89 for the second evening.

Subjective Sleep Quality. As soon as possible after awakening, participants rated their sleep quality using seven items from the Karolinska Sleep Diary (Åkerstedt, Hume, Minors, & Waterhouse, 1994; Keklund & Åkerstedt, 1997). The items included 'How was your sleep last night?' (rated 1 very poor through to 5 very good); 'How calm was your sleep last night?' (1 very restless to 5 very calm); 'How easy did you find it to fall asleep?' (1 very difficult to 5 very easy); 'Did you wake up prematurely?' (rated on a three-point scale: yes, I woke up much too early; yes, I woke up a bit too early; and no, I did not wake prematurely); 'How easy was it for you to wake up?' (rated on a five-point scale: 1 very difficult to 5 very easy); 'How rested do you feel?' (rated on a three-point scale: not rested at all, somewhat unrested, and completely rested); and 'Did you get enough sleep?' (rated on a five-point scale: 1 no, definitely too little to 5 yes, definitely enough). As previously

shown by Keklund and Åkerstedt (1997), these items combine to create a sleep quality index that captures both initiation and maintenance of sleep. Cronbach's alpha for the first sleep was .71 and was .79 for the second sleep.

HRV Measurements

Evening HRV and Nocturnal HRV. We measured HRV using the Actiheart monitor (Cambridge Neurotechnology, 2004) to assess evening and nocturnal HRV. The Actiheart monitors are able to measure heart rate and movement counts simultaneously. The device was worn with the corresponding chest strap, which allowed it to be worn easily, comfortably, and for it to lay flat on the chest. The Actiheart device has also been validated and found to be reliable in previous reports (Brage, Brage, Franks, Ekelund, & Wareham, 2005).

Processing the recordings. To ensure the recordings reflected the time periods we intended (in the evening after work and during sleep), we made use of the self-report data that was collected that indicated when participants finished work as well as when they typically went to sleep. Additionally, we visually scanned the heart rate data to find time periods that would reflect these periods for the participants. Between 20:00 (8:00pm) and 22:00 (10:00pm) would be used for the evening HRV recording. This time reflected a period between when all participants had reported finishing work and before falling asleep. Between 00:00 (12:00am) and 02:00 (2:00am) would be used for the sleeping or nocturnal HRV recording. This time reflected a period where all participants had reported being asleep and could be seen within their heart rate data that they were asleep. A 5-minute continuous stream of inter-beat-interval data was captured from each of these periods for each participant. The segments were visually checked for artifacts and the first clean 5-minute segment was used for further processing.

HRV measurements. The HRV parameters were analysed using the Actiheart software. From the selected 5-minute segments, a time domain measure of normal-to-normal (NN) interval was recorded for the segment. Specifically, the standard deviation between normal-to-normal intervals (SDNN), which reflects the fluctuations within autonomic functioning (Shaffer, McCarty, & Zerr, 2014). The measurements and analyses were performed following recommendations from the Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology (1996). Once the HRV variables were created, tests for normality and outliers were run before any further analyses. When outliers were identified, they were replaced with values that were ±2 SD above or below the mean (Field, 2013). The variables were then averaged over the two days to produce the final evening HRV and nocturnal HRV variables.

Statistical Analysis

Moderation analysis. The moderation analyses were performed using SPSS 25, with the PROCESS V.3 macro (Hayes, 2017). This analysis allows for testing whether the predictor variables (perfectionistic strivings and perfectionistic concerns) are directly related to the outcome variables (main effects), as well as tests the interaction between perfectionism and worry and rumination (conditional effects). The analyses set out to investigate whether perfectionism impacted employees' average two-day psychophysiological wellbeing. We explored the average of the two-days to ensure that the nights we were investigating represented typical day-to-day functioning for these participants, rather than the results of a particularly stressful day. However, based on comments from the examiners of this thesis, further exploratory analyses were run in order to test whether there were any effects on the variables each day, rather than only investigating the averages for each

variable. This also allows for an exploration into the measures and whether they are reliable over the two days by exploring the correlations between the measures on each day.

Furthermore, following suggestions for reliable testing, 15 participants are needed for each predictor variable (Stevens, 1996). With 51 participants, we remained cautious when including covariates within the moderation analyses. For each analysis, worrying and ruminating was the moderating variable, while one dimension of perfectionism was being tested, therefore allowing one additional covariate. Previous research has argued that when the negative associations of perfectionistic concerns are suppressed, perfectionistic strivings are associated with more positive outcomes (Hill, 2014; 2017; Stoeber & Damian, 2016). Although, partialling has been suggested as being essential to understanding the shared, unique, and interactive relationships between perfectionistic strivings and concerns (Stoeber & Gaudreau, 2017). Therefore, for this analysis, we included both dimensions into each model together. Unfortunately, this meant that due to of the lack of participants and power, the analysis would not allow for additional confounding factors such as age, gender, and body mass index.

Table 3.1

Means, standard deviations, and correlations for the average study variables.

	Means	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Perfectionistic Strivings	4.08	.99							
(2) Perfectionistic Concerns	2.71	.89	.60**						
(3) Worry and Rumination	2.20	.99	0.12	.39**					
(4) Anxious Affect	1.71	.67	0.19	0.24	.70**				
(5) Enthusiastic Affect	2.75	.84	-0.14	-.29*	-0.24	-.36**			
(6) Evening HRV	56.06	20.93	0.19	0.18	0.15	-0.06	0.15		
(7) Subjective Sleep Quality	3.03	.58	-0.27	-0.25	-0.26	-.47**	0.23	-0.02	
(8) Nocturnal HRV	53.48	20.89	-0.03	0.01	-0.06	-0.21	-0.10	.55**	0.14

Note. *Correlation is significant at the .05 level (2-tailed). **Correlation is significant at the .01 level (2-tailed).

Results

Hypothesis Testing

To explore the average wellbeing measures over the two days, moderation analyses were performed. Prior to running the moderation tests using Process (Hayes, 2017), assumptions for all multiple regression analyses were tested and met. Descriptive statistics and correlations for all variables are presented in Table 3.1. Additionally, since we were running multiple statistical tests, to reduce the risk of Type I error, we utilised the Bonferroni correction and adjusted the p-value. Therefore, for a statistically significant result, p would have to be less than .005.

Process allows for the testing of the main effect or relationship between the predictor variable and the outcome variable, as well as the conditional effect or interaction between the predictor and moderator variables, all within the same model. In order to test hypothesis 1, we first investigated the main effects between perfectionistic concerns and each wellbeing measure. It was found that perfectionistic concerns did not significantly account for the variance in any of the outcome variables, thus rejecting hypotheses 1a-1e. Similarly, for hypothesis 2, we investigated the main effects between perfectionistic strivings and each wellbeing measure. It was also found that perfectionistic strivings did not significantly account for the variance in any of the outcome variables, thus rejecting hypotheses 2a-2e. Results can be found in Table 3.2 for perfectionistic concerns and in Table 3.3 for perfectionistic strivings.

In order to test hypothesis 3, the conditional effects between perfectionistic concerns and worry and rumination were explored for each wellbeing measure. It was found that the inclusion of worry and rumination did not significantly moderate the relationship between perfectionistic concerns and any of the measures of

wellbeing. Therefore, we reject hypotheses 3a-3e. Lastly, to test hypothesis 4, the conditional effects between perfectionistic strivings and worry and rumination were explored for each wellbeing measure. It was found that worry and rumination did not significantly moderate the relationship between perfectionistic strivings and any of the measures of wellbeing; rejecting hypotheses 4a-4d. Results can be found in Table 3.2 for perfectionistic concerns and in Table 3.3 for perfectionistic strivings.

Table 3.2

Main and Interactive Effects of Average Worry and Rumination on Perfectionistic Concerns

					95% Confidence Interval	
Outcome	Predictor	Coefficient	Standard Error	*t*	Lower Bound	Upper Bound
Anxious affect	PC	-.02	.12	-.19	-.26	.22
	W&R	.37**	.08	4.79	.22	.53
	PC X W&R	.05	.08	.58	-.12	.22
Enthusiastic affect	PC	-.32	.19	-1.73	-.70	.05
	W&R	-.03	.12	-.28	-.28	.21
	PC X W&R	-.14	13	-1.05	-.41	.13
Evening HRV	PC	3.62	4.68	.77	-5.79	13.03
	W&R	.41	3.07	.13	-5.76	6.59
	PC X W&R	4.71	3.33	1.41	-2.00	11.42
Sleep Quality	PC	-.13	.13	-1.01	-.38	.13
	W&R	-.02	.08	-.23	-.18	.15
	PC X W&R	-.14	.09	-1.57	-.32	.04
Nocturnal HRV	PC	2.33	4.86	.48	-7.45	12.11
	W&R	-1.19	3.19	-.37	-7.60	5.23
	PC X W&R	2.94	3.46	.85	-4.03	9.91

Note: PC = Perfectionistic Concerns. W&R = Worry and Rumination. *significant at the .01, **significant at the .001 level.

Table 3.3

Main and Interactive Effects of Average Worry and Rumination on Perfectionistic Strivings

Outcome	Predictor	Coefficient	Standard Error	*t*	95% Confidence Interval	
					Lower Bound	Upper Bound
Anxious affect	PS	.12	.10	1.30	-.07	.32
	W&R	.37**	.07	5.09	.22	.52
	PS X W&R	.08	.06	1.16	-.06	.21
Enthusiastic affect	PS	.05	.15	.31	-.25	.35
	W&R	-.04	.11	-.39	-.27	.19
	PS X W&R	-.15	.10	-1.47	-.35	.06
Evening HRV	PS	3.12	3.87	.81	-4.66	10.91
	W&R	1.90	2.95	.64	-4.05	7.85
	PS X W&R	.94	2.63	.36	-4.37	6.24
Sleep Quality	PS	-.10	.10	-.96	-.30	.11
	W&R	-.03	.08	-.42	-.18	.12
	PS X W&R	-.14	.07	-2.07	-.28	-.003
Nocturnal HRV	PS	-1.43	3.94	-.36	-9.36	6.51
	W&R	-.71	3.01	-.23	-6.77	5.36
	PS X W&R	2.21	2.69	.82	-3.20	7.61

Note: PS = Perfectionistic Strivings. W&R = Worry and Rumination. *significant at the .01 level. **significant at the .001 level.

Exploratory Analysis

Further exploratory analyses were run in order to test whether there were any effects on the variables for each individual day. The analyses were performed in the same fashion as the hypothesis testing, but instead of looking at the outcome variables as averages of the two days, we ran the analyses for each measure on each day. Before running the exploratory moderation analyses in Process (Hayes, 2017), assumptions for all multiple regression analyses were tested and met. Descriptive

statistics and correlations for the variables for each day are presented in Table 3.4. The Bonferroni corrected *p*-value was .005.

We first explored the main effects between perfectionistic concerns and each wellbeing measure over the two days. It was found that perfectionistic concerns did not significantly account for the variance in any of the outcome variables on either of the two days. Similarly, when investigating the main effects between perfectionistic strivings and each wellbeing measure, it was also found that perfectionistic strivings did not significantly account for the variance in any of the outcome variables on each of the days. Results can be found in Table 3.5 for perfectionistic concerns and in Table 3.6 for perfectionistic strivings.

The conditional effects between perfectionistic concerns and worry and rumination were explored for each day for the various wellbeing measures. It was found that the inclusion of worry and rumination did not significantly moderate the relationship between perfectionistic concerns and any of the measures of wellbeing. Additionally, it was found that worry and rumination did not significantly moderate the relationship between perfectionistic strivings and any of the measures on either of the two days. The additional exploratory analyses did not result in any significant results. Results can be found in Table 3.5 for perfectionistic concerns and in Table 3.6 for perfectionistic strivings.

Table 3.4

Means, standard deviations, and correlations for the study variables on day 1 and day 2

	M	*SD*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Perfectionistic Strivings	4.08	.99													
(2) Perfectionistic Concerns	2.71	.89	.60**												
(3) Day 1 Worry and Rumination	2.38	1.08	.20	.44**											
(4) Day 1 Evening HRV	54.75	27.28	.26	.25	.12										
(5) Day 1 Anxious Affect	1.80	.70	.20	.15	.61**	-.14									
(6) Day 1 Enthusiastic Affect	2.77	.94	-.18	-.19	-.24	.04	-.41**								
(7) Day 1 Nocturnal HRV	54.23	26.19	-.04	.10	-.12	.35*	-.17	-.12							
(8) Day 1 Subjective Sleep Quality	3.00	.62	-.12	-.08	-.25	-.11	-.48**	.41**	-.05						
(9) Day 2 Worry and Rumination	2.02	1.11	.04	.28*	.67**	.12	.54**	-.06	-.01	-.15					
(10) Day 2 Evening HRV	59.29	24.93	.09	.06	.10	.60**	-.20	.13	.22	.02	.08				
(11) Day 2 Anxious Affect	1.64	.81	.12	.26	.55**	.01	.58**	-.05	-.16	-.36*	.59**	.01			
(12) Day 2 Enthusiastic Affect	2.76	.97	-.13	-.33*	-.23	-.03	-.37**	.58**	-.14	.32*	-.26	.20	-.38**		
(13) Day 2 Nocturnal HRV	53.56	27.08	-.03	-.07	-.07	.50**	-0.16	.004	.35*	.08	.01	.50**	-.12	.02	
(14) Day 2 Subjective Sleep Quality	3.05	.68	-.31*	-.33*	-.29*	-.07	-.30*	.03	.10	.56**	-.14	.12	-.33*	.07	.2

Note. *Correlation is significant at the .05 level (2-tailed). **Correlation is significant at the .01 level (2-tailed).

Table 3.5

Main and Interactive Effects of Two-Day Worry and Rumination on Perfectionistic Concerns

Outcome	Predictor	Coefficient	Standard Error	*t*	95% Confidence Interval	
					Lower Bound	Upper Bound
Day 1 Anxious affect	PC	-.31	.19	-1.60	-.69	.08
	W&R(1)	.36	.24	1.49	-.13	.84
	PC X W&R(1)	.03	.08	.44	-.12	.19
Day 1 Enthusiastic affect	PC	.11	.33	.33	-.55	.77
	W&R(1)	.02	.41	.05	-.81	.84
	PC X W&R(1)	-.07	.13	-.52	-.34	.20
Day 1 Evening HRV	PC	.92	9.65	.10	-18.53	20.37
	W&R(1)	-3.87	12.06	-.32	-28.18	20.43
	PC X W&R(1)	1.66	3.91	.43	-6.22	9.55
Day 1 Sleep Quality	PC	.03	.22	.13	-.41	.47
	W&R(1)	-.24	.27	-.89	-.79	.31
	PC X W&R(1)	.03	.09	.33	-.15	.21
Day 1 Nocturnal HRV	PC	12.07	9.17	1.32	-6.40	30.54
	W&R(1)	.41	11.45	.04	-22.68	23.49
	PC X W&R(1)	-1.99	3.72	-.54	-9.48	5.50
Day 2 Anxious affect	PC	-.09	.21	-.44	-.53	.34
	W&R(2)	.12	.34	.34	-.58	.81
	PC X W&R(2)	.10	.11	.91	-.12	.32
Day 2 Enthusiastic affect	PC	-.16	.30	-.54	-.76	.43
	W&R(2)	.26	.47	.56	-.69	1.22
	PC X W&R(2)	-.13	.15	-.90	-.43	.17
Day 2 Evening HRV	PC	-10.18	8.03	-1.27	-26.34	5.99
	W&R(2)	-17.08	12.89	-1.33	-43.04	8.87
	PC X W&R(2)	6.21	4.03	1.54	-1.91	14.32
Day 2 Sleep Quality	PC	.13	.20	.66	-.28	.54
	W&R(2)	.53	.33	1.61	-.13	1.18
	PC X W&R(2)	-.19	.10	-1.83	-.39	.02
Day 2 Nocturnal HRV	PC	-12.52	8.79	-1.42	-30.22	5.18
	W&R(2)	-18.60	14.12	-1.32	-47.02	9.81
	PC X W&R(2)	6.31	4.42	1.43	-2.58	15.20

Note: PC = Perfectionistic Concerns. W&R = Worry and Rumination.

Table 3.6

Main and Interactive Effects of Two-Day Worry and Rumination on Perfectionistic Strivings

					95% Confidence Interval	
Outcome	Predictor	Coefficient	Standard Error	*t*	Lower Bound	Upper Bound
Day 1 Anxious affect	PS	-.16	.19	-.83	-.56	.23
	W&R(1)	-.16	.31	-.53	-.78	.45
	PS X W&R(1)	.15	.07	2.10	.01	.29
Day 1 Enthusiastic affect	PS	.26	.34	.76	-.42	.94
	W&R(1)	.52	.54	.97	-.56	1.60
	PS X W&R(1)	-.17	.12	-1.35	-.41	.08
Day 1 Evening HRV	PS	1.07	10.13	.11	-19.34	21.47
	W&R(1)	-4.44	16.12	-.28	-36.92	28.04
	PS X W&R(1)	1.27	3.67	.35	-6.13	8.66
Day 1 Sleep Quality	PS	.18	.22	.79	-.27	.63
	W&R(1)	.35	.35	.99	-.37	1.06
	PS X W&R(1)	-.12	.08	-1.48	-.28	.04
Day 1 Nocturnal HRV	PS	-3.92	9.64	-.41	-23.34	15.51
	W&R(1)	-6.95	15.34	-.45	-37.87	23.97
	PS X W&R(1)	.38	3.49	.11	-6.66	7.41
Day 2 Anxious affect	PS	-.07	.22	-.33	-.52	.37
	W&R(2)	.17	.38	.44	-.59	.92
	PS X W&R(2)	.06	.08	.69	-.11	.23
Day 2 Enthusiastic affect	PS	.28	.31	.90	-.34	.89
	W&R(2)	.25	.52	.48	-.79	1.29
	PS X W&R(2)	-.09	.12	-.79	-.32	.14
Day 2 Evening HRV	PS	-.11	8.47	-.01	-17.16	16.94
	W&R(2)	-3.48	14.36	-.24	-32.38	25.42
	PS X W&R(2)	1.27	3.20	.40	-5.17	7.71
Day 2 Sleep Quality	PS	.21	.21	1.01	-.21	.63
	W&R(2)	.63	.35	1.78	-.08	1.34
	PS X W&R(2)	-.16	.08	-1.98	-.31	.001
Day 2 Nocturnal HRV	PS	-6.56	9.17	-.72	-25.02	11.89
	W&R(2)	-13.71	15.54	.88	-44.98	17.57
	PS X W&R(2)	3.34	3.46	.97	-3.63	10.31

Note: PS = Perfectionistic Strivings. W&R = Worry and Rumination.

Discussion

The overall aim of this study was to investigate the relationship between multidimensional perfectionism and employees' emotional and physical wellbeing in the evening after work, as well as to investigate when employees worry and ruminate and how this affects those relationships. The first aim was to explore multidimensional perfectionism and employees' subjective wellbeing in the evening and subjective sleep quality, in addition to objective wellbeing using measures of HRV during the evening and sleep, all over the course of two evenings. It was found that both perfectionistic strivings and perfectionistic concerns did not significantly account for the variance in any of the wellbeing indicators, which included anxious and enthusiastic affect, evening and nocturnal HRV, and subjective sleep quality.

The lack of significant findings within the moderation analyses may suggest that employee perfectionism may not have significant impact on employees' wellbeing; however, the correlational findings show some links between perfectionism and evening wellbeing. Specifically, perfectionistic strivings were negatively correlated with subjective sleep quality on the second evening, but was not correlated with worry and rumination or any of the other outcome variables. Perfectionistic strivings are typically attributed to more positive outcomes (Hill & Curran, 2016); however, this adds to the ongoing debate about the adaptiveness of perfectionistic strivings (Flett & Hewitt, 2006; Stoeber & Otto, 2006). Perfectionistic concerns, on the other hand, were correlated with the average worry and rumination levels, as well as each day-level measure of worry and rumination when they were broken down within the exploratory analyses. Perfectionistic concerns were also negatively correlated to enthusiasm and subjective sleep quality in the evening of the second day. These correlational findings show similar patterns

to previous research which attributes perfectionistic concerns being more related to negative outcomes (see Harari et al, 2018 for a review).

The second aim was to explore whether worrying and ruminating in the evening after work moderated the relationship between multidimensional perfectionism and employees' evening subjective and objective wellbeing. For both perfectionistic strivings and concerns, it was found that worry and rumination did not moderate the relationship between perfectionism and any of the two-day average wellbeing indicators. Further exploratory analysis looked at each of the two research days separately to test whether there were any effects when looking at worry and rumination on each day and how that affected wellbeing that evening. Again, it was found that for both perfectionistic strivings and concerns, worry and rumination did not moderate the relationship between perfectionism and employees' objective and subjective wellbeing.

Given that no significant main effects were found between both perfectionistic strivings and concerns with any of the wellbeing measures and no further moderation findings, we need to proceed with caution when interpreting the results from this research project. Although the following discussion is speculation, it is hoped that it will shed some light on possible theoretical and methodological explanations for the lack of statistically significant results. Additionally, it is hoped that further research will use this project to inform continued research into multidimensional perfectionism and its impact on employees' health and wellbeing.

Theoretical Explanations

There are a number of different possible explanations and theories that could rationalise why no significant results were found within this study; however, one notable interpretation may lie within the diathesis-stress model. Although this study

did not directly test the diathesis-stress model, it may be able to offer some perspective to the results, particularly adding insight to the lack of results for perfectionism uniquely influencing employee wellbeing in the evening after work.

As mentioned when introducing this study, research has begun to focus on investigating whether perfectionism is only activated when stressors are active, such as during working periods (Flett et al., 1995). It has been suggested that perfectionism acts as a diathesis, being activated when work-related stressors are present and remains inactive or dormant when work-related stressors are not present (Flaxman et al., 2012). Perfectionism has been found to be more or less salient depending on the environment, and has been found to be the most salient within the workplace and less salient outside of work (Harari et al., 2018). Within the workplace, perfectionism can be triggered by interpersonal stressors and stressors related to achievement or performance, while these stressors are typically not present outside of the workplace. Furthermore, the model explains that the diathesis and the stressor must both be present to impact an individual's wellbeing (Zuckerman, 1999).

Typically, research exploring perfectionism and the diathesis-stress model will examine periods where stressors are actively present and when they are not, such as during a working week and during a vacation period (Flaxman et al.,2012). In this current research, it is possible that there were no results for perfectionism influencing well-being because perfectionism was not being activated. However, the current research did not explore a measure of stress during the work-day when stressors are active, so we cannot be certain. Future researcher are encouraged to explore measures during the working day, as well as measures during the evening after-work. This would allow for a direct comparison between the different time

periods, and test whether this explanation has some validity.

This study hypothesised that there would be a carry-over effect of employees' work-day stress into the evening, in the form of worry and rumination, which would then impact subjective and objective wellbeing during leisure periods and during sleep. The diathesis-stress model of perfectionism summarises that the relationship between perfectionism and stress may present itself in differing ways. Perfectionists may anticipate future stress, generate a stress response, prolong the stress response, and reactivate a previous stress (Hewitt & Flett, 2002). Therefore, in accordance with the diathesis-stress model, worry and rumination were thought to be cognitive representations of a stressor, which then triggers the perfectionism diathesis. In this case, it was believed that perfectionism would moderate the relationship between perfectionism and wellbeing variables, therefore having detrimental effects on evening wellbeing and recovery. However, the results did not find this, which could suggest that worrying and ruminating were not triggering or activating a perfectionistic response in the evening and during sleep.

The perfectionism cognition theory explores the underlying cognitive mechanism, processes, and outcomes that are associated with perfectionism (Flett, Nepon, & Hewitt, 2016). The theory outlines cognitive perseveration, notably worry and rumination, as being central links between perfectionism and wellbeing, largely due to perfectionists' compulsive need to be perfect (Xie et al., 2019). The perfectionism cognition theory highlights that worry and rumination can initiate and prolong the stress activation within perfectionists. Specifically, distressed perfectionists experience worry and rumination as automatic thoughts and dysfunctional attitudes because of their need to be perfect (Flett, Nepon, & Hewitt, 2016).

There are three central themes within the theory that outline the connection between perfectionism and perseverative cognition (Flett, Nepon, & Hewitt, 2016). First, both perfectionistic concerns and perfectionistic strivings are both associated with worry and rumination. This current research did find correlational support for perfectionistic concerns being related to worry and rumination in the evening. However, there was no support for perfectionistic strivings being related to worry and rumination. Second, perfectionists experience several different forms of cognitive perseveration, however this research only focused on worry and rumination in this case. And finally, that worrying and ruminating is linked to emotional and physical health problems, which this research also did not find support for. However, there is previous evidence that found perfectionistic concerns were linked to worry and rumination during non-work periods (Flaxman et al., 2012; 2018). Perfectionistic strivings, on the other hand, have been associated with work day engagement due to the tendency to think positively about work in the evening, instead of worrying and ruminating (Flaxman et al., 2018). Therefore, we cannot discredit the perfectionism cognition theory based solely on the lack of results within this study. It is hoped that research continues to explore the perfectionism cognition theory and finds more evidence that will guide the continued development of this theory.

Overall, the lack of significant findings in this research suggests that there may not be a relationship between multidimensional perfectionism and employees' psychophysiological wellbeing in the evening after the working day and during sleep. Moreover, this research did not find any evidence to support that worry and rumination moderated any of the relationships between multidimensional perfectionism and wellbeing. These findings may act as a contribution to the

diathesis-stress model and the perfectionism cognition theory, although there are additional methodological explanations that might bring insight into these findings.

Methodological Explanations

In addition to the theoretical explanations, there are a number of possible methodological explanations which might account for the lack of significant findings within this research. This study was designed to be the first field study to explore multidimensional perfection and HRV; however, measuring HRV comes with certain challenges and might have impeded on the ability to properly explore employees during their leisure or non-working periods. Additionally, the field-based study design resulted in several restrictions when collecting and analysing the data. These restrictions, largely the burden on participants and challenges for researchers while collecting the data, contributed to the limited number of participants and did not allow for enough power within the analyses.

First, HRV has typically been regarded as a non-invasive and effective way to measure the autonomic nervous system, which has allowed for an emerging area of research which explores occupational stress and psychophysiological health (see Jarvelin-Pasanen, Sinikallio, & Tarvainen, 2018 for a review). This method has offered great insight into overall employee health and wellbeing, although there are a number of different critiques of the use of HRV. One critique of HRV research is the use of differing indices used when calculating and analysing HRV data. There are many different types of indices or metrics typically used to measure HRV data that can be chosen from and investigated by researchers (Shaffer & Ginsberg, 2017). This includes time-domain measures, frequency-domain measures, and non-linear measures. Each parameter analyses different sections of the raw HRV data in order to compute HRV scores for each participant. For this study, a time-domain measure,

specifically the standard deviation of the inter-beat-interval of normal sinus beats (SDNN) metric was used. SDNN was chosen based on guidelines outlined in Task Force of the European Society of Cardiology and North American Society of Pacing and Electrophysiology (1996). Additionally, SDNN reflects overall HRV for each individual and is the most commonly used time-domain HRV parameter when exploring occupational stress (Jarvelin-Pasanen, Sinikallio, & Tarvainen, 2018). There is a possibility that there might have been differing results if this research would have chosen a different metric, such as the root mean square of successive differences between heartbeats (RMSSD), or even a frequency-domain or non-linear measure. It is hoped that future research uses a variety of different HRV indices in order to explore HRV more extensively, as well as provide the opportunity to compare research more seamlessly.

Another critique of HRV data is the potential confounding variables that are intertwined with HRV. For instance, breathing and blood pressure fluctuations can impact HRV as reactions to social, emotional, and cognitive changes, however they might also fluctuate for a number of different reasons (Quintana & Heathers, 2014). For this research, HRV was used as a measure of psychophysiological activation to work-related stress, but it is unsure whether a change in HRV is due to social, emotional, or cognitive stressors, or other underlying influences. Additionally, there are a number of other internal factors that result in higher or lower HRV, including age, gender, body mass index, somatic and psychological illness, to name a few (Cropley et al., 2017; Shaffer, McCrafty, & Zerr; 2014; Uusitalo, Mets, Martinmaki, Mauno, Kinnunen, & Rusko, 2011; Vahle-Hinz, Bamber, Dettmers, Friedrich, & Keller, 2014). Within this study, some of these factors were taken into consideration within the participation selection criteria; however, in order to reach as many

participants as possible, the criteria could not be too stringent.

In addition to internal factors, there are also a number of external factors that could contribute to changes in participants' HRV. Factors such as drinking and smoking can account for differences in participants long-term HRV, as well as influence HRV while a participant is actively drinking or smoking. Similarly, how physically fit someone is impacts HRV, in additional to physical activity and the amount of activeness will cause fluctuations in HRV data (Quintana & Heathers, 2014). Within the current research, we examined a 5-minute long period in the evening and during sleep, however it is not clear exactly what participants may have been doing during that period. For example, for one of the nocturnal recordings, the 5-minute section could be when one participant was sleeping deeply, while another participant might have also been laying still in bed, but was awake and unable to sleep. This uncertainty could account for more of the variance in HRV scores, as opposed to employee perfectionism.

In an effort to control for external influences, other research develops lab-based research designs when exploring both nocturnal and waking HRV. In defense of the design, we did not believe that a lab-based environment would accurately resemble the environment that employees typically experience in their evenings after work. However, more precautions could have been executed to ensure some unity in the data for each participant. For instance, participants could have been given a relaxation task to perform in the evening, such as a 10-minute mindfulness exercise, which would have allowed for a period in the data that would reduce some of the potential external factors that impact HRV.

Lastly, a major methodological explanation for the statistically insignificant findings is the lack of power within this study. The sample consisted of 51

participants, which is a similar size, if not larger, to other research projects also using measuring of HRV which found significant results (see Azam et al., 2015; Brosschot, Van Dijk, & Thayer, 2006; Cropley et al., 2017; Wojniusz, Callen, Sutterlin, Andersson, Schepper, Gies, & Vogele, 2016). Additionally, following recommendations for a reliable analysis, 15 participants were needed for each predictor variable (Stevens, 1996). Within the analyses, we had worry and rumination as the moderator, one dimension of perfectionism being tested, and the other dimension being controlled for. This meant that because of the lack of participants and power, the analysis would not allow for additional confounding factors such as age, gender, body mass index, smoking, alcohol use, tobacco use, medication use, or somatic and psychological illness. The correlational findings suggested a value in examining perfectionism and wellbeing, however the moderation analyses yielded insignificant findings. It is possible that the effects were small within the analyses but went undetected because of power and the lack of sufficient control variables. We encourage future researchers to recruit additional participants to increase power, as well as include potential confounding variables within the analyses.

Strengths, Limitations, and Future Directions

This research project made methodological contributions by being the first to investigate multidimensional perfectionism and psychophysiological recovery from workplace stress. Although we were not able to find any significant results with HRV, it is hoped that this would not deter continued exploration into perfectionism and recovering from same-day work-related stress in the evening. To the best of our knowledge, this is also the first study to examine perfectionism and physiological measures of wellbeing (HRV) in a field study. One previous study examined

maladaptive perfectionism and HRV recovery after a lab-based stress-induction (Azam et al., 2015), however there does not appear to be any other studies that have examined perfectionism and HRV in the field, especially within the workplace. Furthermore, the inclusion of sleep as an indictor of evening recovery highlights a crucial and fundamental element of natural recovery that is often neglected when exploring recovery from workplace stress. We encourage more recovery researchers to include measures of sleep into future projects.

In addition to the limitations mentioned previously, other limitations to this research should also be considered. Since this was a field study investigating individual day-to-day functioning, there was no uniformity in the participants' working hours, non-working hours, or sleeping hours. We examined two hours in the evening, which corresponded with the timings participants indicated were non-working periods, as well as visually checked for what appeared to be evening recovery. However, there was no control of what activities or experiences participants had in the evening. Therefore, we recommend having stricter time periods where participants wear the monitors, perhaps only asking participants to wear the monitor when they are relaxing in the evening. Another possibility is to have them recount or journal their activities in the evening in detail, so that various activities would be able to be explored or controlled for.

Additionally, with varying timings for when work ended for each participant, the 20:00 to 22:00 period in the evening could vary on how long participants had to recover (e.g., someone finishing work at 16:00 having 4 hours of non-work time before HRV was recorded compared to someone who finishing work at 19:00 having 1 hour of non-work time before HRV was recorded). This is also true for the nocturnal HRV measurement. Participants indicated that they went to

sleep at different times, and even though the 00:00 to 02:00 period was visually checked to be a sleeping period for every participant, it might represent a different aspect of the sleep cycle for different individuals. The first four hours of sleep should include more deep, slow wave sleep, rather than the later hours towards the morning (Uusitalo et al., 2011). Therefore, the two-hour period this research recorded should be representative of deep sleep for every participant, but we cannot be certain. One recommendation to account for these differences is to focus on one profession or one organisation that has some uniformity in their working hours. Moreover, additional selection requirements for working hours and sleeping hours could be required. Though this may limit possible participants, it would allow for more comparable data points.

This research examined employees' evening recovery from work-related stress, specifically investigating whether multidimensional perfectionism was related to evening recovery when they worried and ruminated. It is recommended that future research continues to investigate both psychological and physiological recovery from work related stress, ideally exploring the diathesis-stress model of perfectionism and evening recovery. It is hoped that future recovery research continues to explore individual differences when it comes to being able to recover in the evening after work and the impact on sleep. Lastly, future research could also explore the within-person combinations of perfectionism (see Gaudreau & Thompson, 2010) as possible predictors for the variance in psychophysiological recovery, allowing for an exploration into categorical comparisons of employees with high and low perfectionistic strivings and perfectionistic concerns.

Conclusion

Despite the growing interest in employees' evening recovery from work-related stress, there is still little understanding of the cognitive functions that may impact employees' ability to recover, as well as potential individual differences that may be effecting employees during non-working periods. This research tested how two perfectionism dimensions were related to psychophysiological recovery from workplace stress in the evening at work and during sleep. This research also tested whether worry and rumination moderated the relationship between perfectionism and psychophysiological wellbeing. This research was not able to find support that multidimensional perfectionism significantly accounts for the variance in employee's evening wellbeing. Additionally, worrying and ruminating was not found to moderate the relationship between perfectionism and evening wellbeing. However, it is hoped this study will encourage further research into possible individual differences that enhance or damage employees' psychophysiological recovery.

Chapter 6: General Discussion

The overall aim of this thesis was to explore multidimensional perfectionism and both psychological and physiological recovery from work-related stress. Specifically, this thesis was interested in exploring whether perfectionism acts as a personality trait that either helps or hinders employees' ability to recovery from job-stress during non-working periods. Stressors within the workplace are often seen to be inevitable, due to the required effort needed to complete the tasks and responsibilities of one's job. These stressors are not necessarily harmful, but if the psychophysiological response to the stressor carries over into periods away from work, this is when the stressor can affect employees' mental and physical health. To stay focused and engaged at work each day, employees must recover from the stress experienced at work during non-working periods (Bakker, 2011; Sonnentag & Fritz, 2015; Trougakos, Beal, Green, & Weiss, 2008).

One personality disposition that has been suggested to impact employees' ability to recover from work-related stress is perfectionism. Perfectionism is defined as setting extremely high standards for oneself and one's work, striving for flawlessness in their tasks, and the tendency to critically evaluate one's own behaviour (Childs & Stoeber, 2010; Hill & Curran, 2016; Stoeber, Edbrooke-Childs, & Damian, 2016; Stoeber & Rennert, 2008). Perfectionistic tendencies tend to be heightened within the workplace, due to social and interpersonal pressures, as well as achievement and performance-based tasks. Additionally, perfectionism is often seen as a positive value for employees to possess within organisations (Ozbilir, Day, & Catano, 2014; Stoeber & Damien, 2016). However, research has continued to find that the consequences of perfectionistic thoughts and behaviours outweigh any benefits for individual employees' health and wellbeing (Harari et al., 2018).

The first aim of this thesis was to explore multidimensional perfectionism over a vacation period, to investigate whether perfectionistic strivings or perfectionistic concerns helped or hindered rates of recovery and rates of post-vacation fade out. The second aim of this thesis was to explore the within-person combinations of perfectionistic strivings and perfectionistic concerns, explicitly to test whether the tripartite model of perfectionism or the 2x2 model of perfectionism was a better fit model for the subtypes of perfectionism. Additionally, the research aimed to explore how being a member of each subtype impacts employees' wellbeing during a working week and during a vacation week. The final aim of this thesis was to explore multidimensional perfectionism and psychophysiological wellbeing in the evening during a non-working period and during a sleeping period. The research explored both subjective measures (affective wellbeing and subjective sleep quality) and objective measures of wellbeing (evening and nocturnal heart rate variability).

This final chapter will revisit the three empirical studies that form this thesis and summarise the main findings from each study. There will then be a discussion of the contributions this thesis has made for theory and methodology within the perfectionism and work-related stress recovery fields. The practical implications of the research findings within the thesis will then be presented. And finally, the limitations of the research, along with directions for future research, will be examined in hopes that further research will be conducted.

Summary of Results from Empirical Chapters

This thesis is comprised of three empirical studies exploring multidimensional perfectionism and recovery from work-related stress during non-working periods. The first study examined employee perfectionism during a

vacation from work, specifically exploring the relationship between multidimensional perfectionism and school teachers' wellbeing over a half-term break. The second study investigated the within-person combinations of multidimensional perfectionism and school teachers' wellbeing during a working week and during a vacation week. And finally, the third study explored multidimensional perfectionism and psychophysiological recovery, in addition to testing whether worry and rumination moderate the relationship between perfectionism and evening wellbeing. The following section will summary the key findings from each empirical chapter.

Study one: Employee perfectionism during a vacation: Exploring the relationship between multidimensional perfectionism and school teachers' wellbeing over a half-term break

The first aim of this study was to explore the rate of change in both the recovery and fade out of school teachers' work-related emotional exhaustion and cynicism, as well as context-free anxious and depressed affect over a vacation period. The findings showed that teachers experienced a decrease in emotional exhaustion, cynicism, anxious and depressed affect going into the vacation and a rapid increase when returning to work.

The second aim was to examine whether multidimensional perfectionism influenced the rate of change in recovery during the vacation and the fade out of vacation benefits once work resumed, specifically to investigate whether perfectionistic strivings and perfectionistic concerns are personality dispositions that either help or hinder school teachers' rates of recovery and fade out over a half-term break. It was found that perfectionism influenced the levels of emotional exhaustion during the first week and during the break (concerns had higher and strivings had

lower emotional exhaustion), but did not have a significant effect on the trajectories of recovery and fade out. Although, perfectionistic concerns were contributing to the rate of recovery and fade out of cynicism over the vacation period.

Similarly, the perfectionistic concerns dimension was a predictor for both a steeper rate of recovery and fade out of anxious and depressed affect over the seven weeks. The perfectionistic strivings dimension was a predictor for a less steep rate of recovery for anxious and depressed affect. Perfectionistic strivings were not a predictor for the variance in fade out once work resumed. When piecing the recovery and fade out trajectories together, it can be inferred that higher levels of perfectionistic concerns predicted more drastic growth patterns over the seven weeks, where higher levels of perfectionistic strivings predicted a more stable trajectory for anxious and depressed affect.

Study two: Within-person combinations of multidimensional perfectionism and school teachers' wellbeing during a working week and during a vacation week

The first aim of this research was to explore the within-person combinations of perfectionistic strivings and perfectionistic concerns, to see how they organise themselves within the sample of school teachers. Specifically, this research explored the number of subtypes of perfectionism present in order to directly test whether the tripartite or 2x2 model of perfectionism was the best fit model. It was found that a four cluster solution was a better fit compared to a three cluster solution, indicating that the 2x2 model of perfectionism was the best representation of the within-person combinations of perfectionism within this sample.

With the number of clusters determined, the second aim was to investigate the different parameters or levels of perfectionistic strivings and perfectionistic

concerns in each cluster. This allowed us to see whether the data-driven parameters, either high or low levels of perfectionistic strivings and concerns, match those that the theoretical model suggests. It was found that the clusters generally followed the same pattern mapped out by the 2x2 model. The non-perfectionist subtype had low levels of both perfectionistic strivings and concerns, whereas the mixed perfectionist subtype had high levels of both perfectionism dimensions. The Pure PS subtype had high levels of perfectionistic strivings and low levels of perfectionistic concerns, as well as the Pure PC subtype had high levels of perfectionistic concerns and low levels of perfectionistic strivings.

With the subtypes established, the next aim was to explore how being a member of each subtype impacted the school teachers' wellbeing, both work-related burnout and context-free positive and negative affect. In particular, the aim was to explore whether perfectionism's impact on wellbeing is present during a working week and if it has the same effect during a vacation week for each subtype of perfectionism. It was found that those in the Pure PS subtype had significantly lower emotional exhaustion, cynicism, anxious and depressed affect, as well as higher comfort during the working week compared to mixed perfectionists and Pure PC. However, the Pure PS was not significantly different from non-perfectionists. It was found that during the vacation week, there was a statistically significant difference between the subtypes of perfectionism for the two burnout measures, but none for the affective wellbeing measures. Which suggests that perfectionism was acting as a diathesis for context-free affective wellbeing.

Study three: Multidimensional perfectionism and psychophysiological recovery: Does worry and rumination moderate the relationship between perfectionism and evening wellbeing?

The overall aim of this research project was to investigate the relationship between multidimensional perfectionism and employees' emotional and physical wellbeing in the evening, as well as investigate when employees worry and ruminate and how this impacts their wellbeing. The first aim was to explore multidimensional perfectionism and employees' subjective wellbeing in the evening and subjective sleep quality, as well as objective wellbeing using measure of HRV during the evening and sleep over the course of two evenings. It was found that both perfectionistic strivings and concerns did not account for the variance in any of the two-day average wellbeing indicators. Further exploratory analysis investigating each individual day, also did not find perfectionism to significantly account of the variance in wellbeing measures. The second aim was to explore whether worrying and ruminating moderated the relationship between multidimensional perfectionism and employees' evening subjective and objective wellbeing. It was found that the relationships between both perfectionistic strivings and perfectionistic concerns and each average wellbeing measure were not moderated by worrying and ruminating in the evening. Further day-level analyses also did not find any significant moderation findings.

Theoretical Contributions

This programme of research has made a number of theoretical contributions, namely in the areas of the relationship between perfectionism and burnout, the diathesis-stress model of perfectionism, and the (mal)adaptiveness of perfectionistic strivings and perfectionistic concerns. The following section will discuss each of these areas.

Perfectionism and burnout

First, these findings have potential implications for the study of

multidimensional perfectionism and burnout. According to previous research, burnout is said to be the most prevalent during working periods because it is an emotional reaction to stressors within the working environment (Maslach & Jackson 1984; Maslach, Schaufeli, & Leiter, 2001). If exposed to a highly stressful working environment, everyone is affected by it in some way. The more exposure to the stressful environment, the more at risk employees are to developing burnout symptoms, such as feeling emotional exhausted by their job and developing a cynical attitude towards their work. Vacations, on the other hand, offer employees the opportunity to escape these working environments which can contain large amounts of harmful stressors; these high-stressor environments are also known as burnout climates (Westman & Eden, 1997). The findings from the first two studies show that while teachers are away from their specific burnout climate, their levels of emotional exhaustion and cynicism decreased. This decrease indicates some relief from the teachers' typical day-to-day work-related stress during their half-term break. However, as soon as they returned to work and were again exposed to their burnout climate, the benefits they had gained from the vacation quickly faded away.

Although the environment appears to have a large impact on employees' wellbeing, the findings also showed that perfectionism predicted different levels of burnout amongst the employees. Specifically, perfectionistic concerns were positively related, and perfectionistic strivings were negatively related, to emotional exhaustion both during working weeks and during the vacation week. When investigating perfectionistic strivings and concerns as continuous variables in the first study and when exploring the within-person combinations of perfectionism in the second study, it was found that those higher in perfectionistic concerns were more prone or more susceptible to higher emotional exhaustion and cynicism during

the research periods, while those lower in perfectionistic concerns experienced lower levels of burnout symptoms.

The findings highlight that employees' perfectionistic thoughts and behaviours did impact how burnt out they felt, both while actively being exposed to the burnout climate and when away from it. The impact of perfectionism was still prevalent during the vacation, shown by higher burnout for employees with higher perfectionistic concerns and lower burnout for employees with lower perfectionistic concerns. While there were some fluctuations in burnout during the vacation, indicating some experience of recovery, the differences amongst perfectionists indicate a lasting effect of work-related stressors which cause those higher in perfectionistic concerns to feel more burnt out. The central aspects of perfectionistic concerns, such as fearing making mistakes or being seen as imperfect by others, has a lasting effect on these employees. Perfectionistic tendencies continued to impact wellbeing during a vacation from work, which impeded on the ability to experience complete or sufficient recovery. As a whole, working environments will influence employees' experience of burnout, such as feeling emotionally exhausted or cynical; however, the findings also indicate that employee perfectionism can influence burnout, even outside of the stressful working environment.

The diathesis-stress model of perfectionism

The findings from the empirical research also have theoretical implications for the study of multidimensional perfectionism and the diathesis-stress model for affective wellbeing. It has been reported the perfectionism is the most impactful within the workplace, due to the interpersonal nature of most workplaces, as well as performance and achievement-related stressors that are present within one's work (Harari et al., 2018). The diathesis-stress model explains that the diathesis, in this

case perfectionism, and a stressor must both be present to impact an individual's wellbeing (Zuckerman, 1999). Therefore, the lack of work-related stressors during non-working periods, such as the evening after work or during vacations periods, would make perfectionism less salient. Being away from one's job should eliminate perfectionists' need to be perfect in front of their colleagues, clients, or bosses, and would reduce their need to be flawless in their work tasks and responsibilities. Without these stressors present, perfectionistic tendencies would not be as strongly triggered and would not be able to negatively impact employees' health and wellbeing.

Study one showed different starting points and recovery trajectories for perfectionistic concerns and strivings that then came together to a similar point during the vacation. During the vacation, the lack of work-related stress meant the teachers' perfectionism remained inactive and could not produce elevated levels of anxious and depressed affect. The employees' anxious and depressed affect levels dropped to a similar point during the vacation, indicating that perfectionism was no longer being triggered to produce negative affect. However, upon returning to work, only the perfectionistic concerns dimension acted as a diathesis to produce a steeper fade out of negative affect. Similar findings were uncovered when exploring the within-person combinations of perfectionism in study two. Specifically, during the working week, perfectionism interacted with work-related stressors resulting in significant differences between the subtypes of perfectionism and measures of affective wellbeing. However, without the work-related stressors present during the vacation week, there were no longer significant differences between the subtypes. This indicates that perfectionism remained relatively dormant or inactive during this vacation week. These findings are encouraging because it suggests that

perfectionistic employees can obtain some benefits to their affective wellbeing during times away from work (also see Flaxman et al., 2012).

Lastly, study three did not produce any findings that would suggest that multidimensional perfectionism significantly accounts for the variance in employees' psychophysiological health during the evening after the working day. One possible explanation for this is that perfectionism was not being strongly triggered during this evening period. This study only explored periods away from work, during the evening and during sleep, so perhaps the lack of significant findings is due to perfectionism remaining dormant or not being triggered. In combination with the results of the first two chapters, this theoretical explanation appears plausible. However, we cannot be certain because this study did not explore wellbeing during a working period, like the first two studies did. Overall, in support of the diathesis-stress model, it was found that the stressors present during periods within the workplace are shown to activate perfectionistic tendencies that negatively impact employees' affective wellbeing. However, during periods outside of the workplace, perfectionism remains dormant and is less likely is to have damaging effects on employees' health and wellbeing.

The (mal)adaptiveness of perfectionistic strivings and concerns

The findings from this thesis also contribute to the understanding of the adaptiveness and mal-adaptiveness of perfectionistic strivings and concerns. Consistent with previous findings, this thesis showed that higher levels of perfectionistic concerns had detrimental effects on measures of employee wellbeing (also see Childs & Stoeber, 2010; Flaxman et al., 2018; Stoeber & Damian, 2016; Stoeber & Rennert, 2008). Moreover, higher levels of perfectionistic strivings appeared to show more beneficial effects for employees. However, taking the results

as a whole showed that lower levels of perfectionistic concerns may be the 'adaptive' side of perfectionism, as opposed to being high in perfectionistic strivings. The trajectories for those lower in perfectionistic concerns were more stable over the seven weeks, and the subtypes with low perfectionistic concerns (Pure PS and non-perfectionists) had better wellbeing both during the working week and during the vacation week. Furthermore, there were no significant differences between the Pure PC and the mixed perfectionists subtypes, suggesting that the high levels of perfectionistic strivings within mixed perfectionism subtype did not buffer the effects of the high levels of perfectionistic concerns. Lastly, perfectionistic concerns were significantly positively correlated with worry and rumination in the evening after the working day, suggesting a continued preoccupation with work-related stress.

When examining perfectionistic strivings, the findings show those higher in perfectionistic strivings experienced better wellbeing, however only when perfectionistic concerns was being controlled for. When the negative associations of perfectionistic concerns are partialled out, perfectionistic strivings are associated with more positive outcomes (Hill, 2014; 2017; Stoeber & Damian, 2016). Therefore, when looking at perfectionistic strivings and concerns comparatively, strivings are shown to be adaptive without the influence of concerns. However, when exploring high and low levels of perfectionistic strivings, is suggests that there are some additional benefits to higher levels. In the seven-week study, when controlling for perfectionistic concerns, those higher in perfectionistic strivings were found to have more stable trajectories than those lower in perfectionistic strivings. Exploring the subtypes of perfectionism showed that the higher levels of perfectionistic strivings added to the adaptiveness when in combination with low

levels of perfectionistic concerns, which set the Pure PS subtype apart of the non-perfectionist subtype. However, when exploring day-level evening recovery, perfectionistic strivings were significantly negatively correlated with subjective sleep quality. This suggests potential problematic aspects of perfectionistic strivings.

Overall, the findings from this thesis showed that when discussing the adaptiveness of perfectionism, we must highlight that the benefits of higher perfectionistic strivings are seen only when in combination with lower perfectionistic concerns. The blend of having an adaptive self-oriented striving for perfection without the fear of losing an illusion of perfection is when perfectionism can possibly help employees. However, having higher levels of perfectionistic concerns will be harmful to employees, even if they also have higher levels of perfectionistic strivings. The need to maintain a perfect persona for other people, which encompasses fears of making mistakes and having doubts about one's actions, will continually have negative impacts on employees' health and wellbeing.

Methodological Contributions

In addition to the theoretical contributions, this programme of research also made some methodological contributions for the study of multidimensional perfectionism. These methodological contributions include the comprehensive measurement of multidimensional perfectionism, exploring employee wellbeing on multiple occasions, and the examination of discrete affective states.

Comprehensive measurement of multidimensional perfectionism

The first methodological contribution within this thesis is the use of both the the FMPS (Frost et al., 1990) and the MPS (Hewitt & Flett, 1991b) multidimensional perfectionism scales. In the early 1990's, these two models of multidimensional perfectionism were developed in an attempt to measure

perfectionism as a multidimensional personality trait. The first was created by Frost and colleagues (1990) and focused on self-directed perfectionistic cognitions, which included sub-facets such as personal standards, concerns over making mistakes, and doubts about actions. The second scale was created by Hewitt and Flett (1991b), and focused on where perfectionistic beliefs stem from and were directed towards (either internally or externally), which created sub-facets like socially-prescribed perfectionism and self-oriented perfectionism. The two scales used together allow for an extensive exploration into the multiple sub-facets within the two higher-order perfectionistic strivings and concerns. Following previous research, thorough measurement testing was conducted with the two scales to investigate their psychometric structure. This thesis found the two high-order dimensions of perfectionistic strivings and concerns, which replicated the theoretical combination of the two scales (also see Cox et al.,2002; Frost et al., 1990; Stumpf & Parker, 2000).

Research into multidimensional perfectionism has typically used one scale, or even just a subscale of one of the scales. However, by including both scales within this thesis, allowed for a thorough measurement of multidimensional perfectionism and the mechanisms that make up each dimension. Additionally, some have suggested that the perfectionistic concerns dimension is just an extreme form of neuroticism, while the perfectionistic strivings dimension is an extreme form of conscientiousness (Flett & Hewitt, 2006; Moate et al., 2016). Therefore, controlling for neuroticism and conscientiousness in the first two studies allowed for research beyond higher level traits.

Exploring employee wellbeing on multiple occasions

The second methodological contribution this thesis made is the use of

wellbeing data points taken on multiple occasions, which examined employee wellbeing over multiple days and weeks. Study one is the first to investigate school teachers' half-term vacation using a seven-week longitudinal research design. There are few research studies that have explored employees' experience of a vacation from work, and until now, none have explored school teachers' week-long half-term (also see Kühnel & Sonnentag, 2011; Newman, 2017). Additionally, within the seven-week research period, data points included two weeks before the half-term break, the week of the break, and four weeks after the break. This allowed for a thorough investigation into the vacation effects and the use of multilevel growth curve modelling to explore the rate of growth over this vacation period. This technique of exploring trajectories of employee wellbeing over a vacation has only recently been added to the vacation literature (see Syrek et al., 2018).

Furthermore, the second study investigated the within-person combinations of perfectionism and school teachers' wellbeing during a working week and a vacation week. The inclusion of a working week and a non-working week allowed for a direct testing of the diathesis-stress model. Specifically, we examined whether perfectionism's impact on employees' wellbeing was having the same effect during a vacation as it was during a working week. Lastly, the final study explored multidimensional perfectionism and employees' objective and subjective wellbeing in the evening after work and during sleep, all over the course of two evenings. The research examined both the averages over the two days, in addition to exploratory analysis that broke down each research day. This method allowed for an exploration into perfectionism's impact during an awake period in the evening, when stressors may still be active, and when employees were asleep, when stressors were inactive over the two days.

Examination of discrete affective states

The third methodological contribution this thesis made was the examination of discrete affective states being measured at the same time. Each of the research studies used a variety of wellbeing measures simultaneously, which enabled an exploration and comparison into different aspects of the employees' wellbeing. Specifically, the first and second studies used both work-related and context-free measures of wellbeing. This allowed for an investigation into whether employee perfectionism would only impact work-related wellbeing or if it would also impact wellbeing that was not focused around work. Additionally, since the research period extended into a vacation period, it was crucial to include measures that gave insight into general wellbeing since work-related measures may not be as relevant.

Moreover, the second and the third studies used measures of both positive and negative affect. The use of both negative and positive affect allows for a greater understanding of overall wellbeing, because being 'well' is not only the absence of or lower levels of negative affect, it is also the existence of and higher levels of positive affect. Lastly, the third study within this thesis utilised both subjective and objective measures of wellbeing. The use of both measures of wellbeing allowed for an exploration into how each employee reported how they were feeling, as well as gave an indicator of their physical health without any personal bias. Overall, the use of various measures of wellbeing allowed for a fuller picture into employees' health and wellbeing, as well as the impact multidimensional perfectionism has on different indicators of employee wellbeing.

Practical Implications

The findings within this thesis offer some practical implications for

organisations and individual employees. The findings highlight the importance of non-working periods for employees' health and wellbeing, especially those more vulnerable to work-related stress. Moreover, the findings suggest that employees do experience recovery during a week-long vacation, but the benefits from a vacation begin to rapidly decrease when returning to work. At the organisational level, in an effort to slow down the fade out of vacation benefits, it is recommended to reduce high workloads as soon as employees are returning to work. Easing back into work and creating an even pace of work would reduce the initial re-emergence of a heavy workload and subsequent decrease in wellbeing when work resumes. This would also support employees by prolonging the benefits that vacations bring to employees (de Bloom, 2015). Additionally, respite-oriented interventions, specifically that would offer guidance on ways to recover more completely during a vacation, would be beneficial to all employees. Hahn and colleagues (2011) found that a training programme focused on understanding specific recovery strategies, such as detaching from work during non-working periods, and putting those strategies into practice, was able to increase recovery experiences. These types of training programmes would beneficial to all employees but especially for those with higher levels of perfectionistic concerns.

Alternatively, certain interventions, such as cognitive behavioural therapy and mindfulness-based training programmes, are useful in decreasing the negative characteristics of perfectionism (Lloyd et al., 2015; Wimberley, Mintz, & Suh, 2016). Based on the findings within this thesis, it is recommended that interventions should be focused on reducing the various aspects associated with perfectionistic concerns, including socially-prescribed perfectionism, doubts about actions, and concerns over making mistakes. Additionally, interventions could focus on

reframing perfectionistic thoughts away from tendencies that are unhealthy and towards tendencies that might be helpful. Since perfectionistic strivings was shown to have beneficial properties, certain aspects of this dimension, like setting high (but realistic) standards for oneself and wanting to be perfect for yourself and not others, could be an additional focus to reframe one's perfectionism.

Limitations and Directions for Future Research

It is important to address the limitations within the empirical chapters of this thesis with the hope that future research will be able to extend and improve upon this research. The three main limitations include the lack on uniformity in recovery activities and experiences, the lack of power within the HRV study, and the generalisability of the findings. Each limitation will be discussed with suggestions on how to strengthen future research exploring employee perfectionism and recovery from job-stress during non-working periods.

Lack of uniformity in recovery activities and experiences

The first limitation of this research is that there was a lack of uniformity in recovery activities both during the vacation for the first and second study, and in the evening after work for the third study. It has been found that different vacation activities and experiences can influence employees' health and wellbeing (de Bloom et al., 2009; 2011; 2013). Specifically, participating in social activities or in relaxing activities during a vacation can enhance wellbeing during the vacation, lead to fuller recovery, and is also associated with increases to wellbeing even after the vacation (de Bloom et al., 2012). However, within the presented research, we did not focus on what the teachers were doing during the vacation week and whether their activities impacted their wellbeing during and after the half-term. For example, teachers who stayed at home during the vacation most likely had a very different

experience compared to those that travelled during the vacation. We would suggest exploring these possible factors that impact wellbeing, or aim to have more uniformity for the vacation at data collection. Specifically, some vacation research has investigated participants that took a particular holiday, such as within a specific resort or during a specific winter sports holiday (de Bloom et al., 2011). This would control for some of the external influences that might result in differences amongst participants and their vacation activities.

Since the half-term break for schools is typically surrounded by high workload, due to project deadlines and mid-term exams, there is the possibility that the teachers sampled continued to work during the vacation. Working during a vacation has detrimental effects on employees' ability to recover from workplace stress during the respite (de Bloom et al., 2011; Demerouti et al., 2009; Van Hooff, Geurts, Kompier, & Taris, 2007). Unlike in the presented research, previous research has controlled for the hours worked during the leisure time (Flaxman et al., 2012). It would be very difficult to require employees to withhold from working during a period of time, therefore we recommend future researchers to include any working hours as a control variable when running statistical analyses.

The same sentiments should be applied to the third study in the thesis, which looked at evening recovery and also lacked any uniformity in recovery experiences. Previous research has shown that relaxing has been found to be an essential experience for recovery (Sonnentag & Fritz, 2007). Unfortunately, we did not record whether or not participants engaged in any relaxation activities in the evening after work. One suggestion for future research is to provide employees an opportunity to relax in the evening, such as a guided meditation or mindfulness practice. This would allow for an exact period in the evening where each participant would be

doing the same activity. Additionally, this would also allow for future research to explore multidimensional perfectionists' evening HRV while engaging in a relaxation activity.

Lack of power in the HRV study

The second limitation of this thesis is the lack of power within study three which examined multidimensional perfectionism and HRV. The research sample included 51 participants, which is a similar size to other research projects examining HRV (Azam et al.,2015; Brosschot, Van Dijk, & Thayer, 2006; Cropley et al., 2017; Wojniusz et al., 2016), however was unable to find any significant results within the moderation analyses. This may be because the effects were small within the analyses but went undetected because of the lack of power. Additionally, while analysing the data, we followed statistical recommendations which meant that additional confounding factors or control variables which could impact perfectionism and HRV were not included. We encourage future researchers to recruit additional participants to increase power. One recommendation to do this is to obtain additional HRV recording devices, which would allow for the testing of additional participants at the same time. Another recommendation is to shorten the amount of time participants are required to wear the monitors, because the burden of wearing research equipment for longer periods of time makes recruiting participants more difficult. Lastly, with the increase of power, it is recommended that future research also includes potential control variables, such as age, gender, body mass index, smoking, alcohol use, tobacco use, medication use, or somatic and psychological illness into the analyses.

Generalisability of the findings

Lastly, the final main limitation within this programme of research is that the

findings may not be able to be generalised to other samples or the general population. The first two research studies examined a sample of teachers from the United Kingdom and the United States. These findings may not be generalisable to other professions (Flaxman et al., 2012; Kühnel & Sonnentag, 2011), or even to other teachers from different regions of the world. It is hoped that research would attempt to replicate the results exploring school teachers' wellbeing over a week-long break in other regions to increased generalisability. Researching vacation periods with teachers is unique because teaching is a profession with set holiday periods, which is not the case for most other professions, therefore the results from this set holiday could vary within other professions. We recommend future research to attempt to replicate the exploration into multidimensional perfectionism presented in the thesis with other professionals. As a whole, the findings from this thesis provide a platform for future research to continue to extend the literature on perfectionism and recovery from work-related stress. Specifically, future research could also explore varying the lengths of the vacation, increasing the number of repeated-measures over longer periods of time, and including a control groups of employees who are not on vacation during the study period. This expansion of the current research would add additional knowledge to the current vacation and perfectionism literature.

Conclusion

This thesis provided evidence for multidimensional perfectionism's impact on work-related recovery. This programme of research expanded recovery and employee perfectionism research by first examining multidimensional perfectionism during a vacation from work. It was found that those higher in perfectionistic concerns had worse recovery and post-vacation trajectories compared to those

higher in perfectionistic strivings. Additionally, this thesis investigated the within-person combinations of perfectionism and found that the 2x2 model of perfectionism was the best fit model for the subtypes of perfectionism. It was also found that during a working week, there were significant differences between the subtypes of perfectionism and wellbeing measures; however, during a vacation week, there were no longer significant differences, confirming that perfectionism may act as a diathesis in regards to work-related stress. Finally, this thesis explored multidimensional perfectionism and psychophysiological recovery, specifically testing whether worry and rumination moderate the relationship between perfectionism and evening subjective and objective wellbeing. Although perfectionism was not found to significantly account for the variance in wellbeing in the evening, we discussed the possible theoretical and methodological explanations for the lack of these findings. It is hoped that the findings from this thesis will influence future research into employee perfectionism and recovery from work-related stress.

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Appendix

Measurement Testing

Table A1

Confirmatory Factor Analysis Results for Initial Measurement Testing for Studies 1 and 2.

Model	χ^2	*df*	NFI	TLI	CFI	RMSEA	$\Delta\chi^2$
Single Factor	1489.61	275	.55	.56	.60	.13	
Two Factor	1476.56	274	.55	.56	.60	.13	13.05*
Three Factor (PC, PS, C+N)	851.17	272	.74	.79	.81	.09	625.40*
Three Factor (C, N, PC+PS)	1424.05	272	.57	.58	.62	.12	52.52*
Four Factor	726.96	269	.78	.83	.85	.08	124.21*

Note. PC: Perfectionistic Concerns, PS: Perfectionistic Strivings, C: Conscientiousness, N: Neuroticism. SPP3 and SPP4 were removed prior to CFA as decided from EFA results. *$p < .001$.

Table A2

Confirmatory Factor Analysis Results for Weekly Measurement Testing for Study 1.

Week	Model	χ^2	*df*	NFI	TLI	CFI	RMSEA	$\Delta\chi^2$
1	Single Factor	533.08	77	.77	.72	.79	.15	
	Two Factor	363.38	76	.84	.82	.87	.12	375.37*
	Three Factor (EE, Cy, A+D)	276.81	74	.90	.89	.92	.10	205.68*
	Three Factor (EE+ Cy, A, D)	232.27	74	.90	.90	.93	.09	119.10*
	Four Factor	157.71	71	.93	.94	.96	.07	74.57*
2	Single Factor	511.61	77	.78	.74	.81	.14	
	Two Factor	318.15	76	.86	.85	.89	.11	378.53*
	Three Factor (EE, Cy, A+D)	303.34	74	.87	.85	.90	.11	185.07*
	Three Factor (EE+ Cy, A, D)	219.48	74	.91	.91	.94	.08	170.27*
	Four Factor	133.08	71	.94	.96	.97	.06	86.40*
3	Single Factor	874.50	77	.61	.50	.63	.19	
	Two Factor	344.61	76	.85	.83	.88	.12	659.02*
	Three Factor (EE, Cy, A+D)	248.54	74	.89	.89	.92	.09	128.13*
	Three Factor (EE+ Cy, A, D)	264.31	74	.88	.88	.91	.10	32.06*
	Four Factor	216.48	71	.90	.90	.93	.09	47.82*
4	Single Factor	514.31	77	.80	.75	.82	.14	
	Two Factor	401.87	76	.85	.83	.88	.12	321.38*
	Three Factor (EE, Cy, A+D)	305.58	74	.87	.85	.89	.11	208.94*
	Three Factor (EE+ Cy, A, D)	281.97	74	.90	.89	.92	.10	112.66*
	Four Factor	192.93	71	.93	.93	.95	.08	89.04*
5	Single Factor	615.41	77	.78	.73	.80	.16	
	Two Factor	418.25	76	.85	.82	.87	.13	437.09*
	Three Factor (EE, Cy, A+D)	326.43	74	.88	.86	.90	.11	239.93*
	Three Factor (EE+ Cy, A, D)	292.96	74	.89	.88	.92	.10	148.11*
	Four Factor	178.32	71	.94	.94	.96	.07	114.64*
6	Single Factor	548.33	77	.78	.74	.81	.15	
	Two Factor	350.49	76	.86	.84	.89	.11	407.78*
	Three Factor (EE, Cy, A+D)	324.01	74	.88	.87	.91	.11	209.94*
	Three Factor (EE+ Cy, A, D)	220.43	74	.91	.92	.94	.08	183.46*
	Four Factor	140.55	71	.95	.96	.97	.06	79.89*
7	Single Factor	712.45	77	.74	.67	.76	.17	
	Two Factor	426.72	76	.84	.82	.87	.13	524.03*
	Three Factor (EE, Cy, A+D)	304.82	74	.88	.87	.91	.11	238.31*
	Three Factor (EE+ Cy, A, D)	276.81	74	.90	.89	.92	.10	116.40*
	Four Factor	188.41	71	.93	.93	.96	.08	88.40*

Note. EE: Emotional Exhaustion, Cy: Cynicism, A: Anxious affect, D: Depressed affect. *$p < .001$.

Table A3

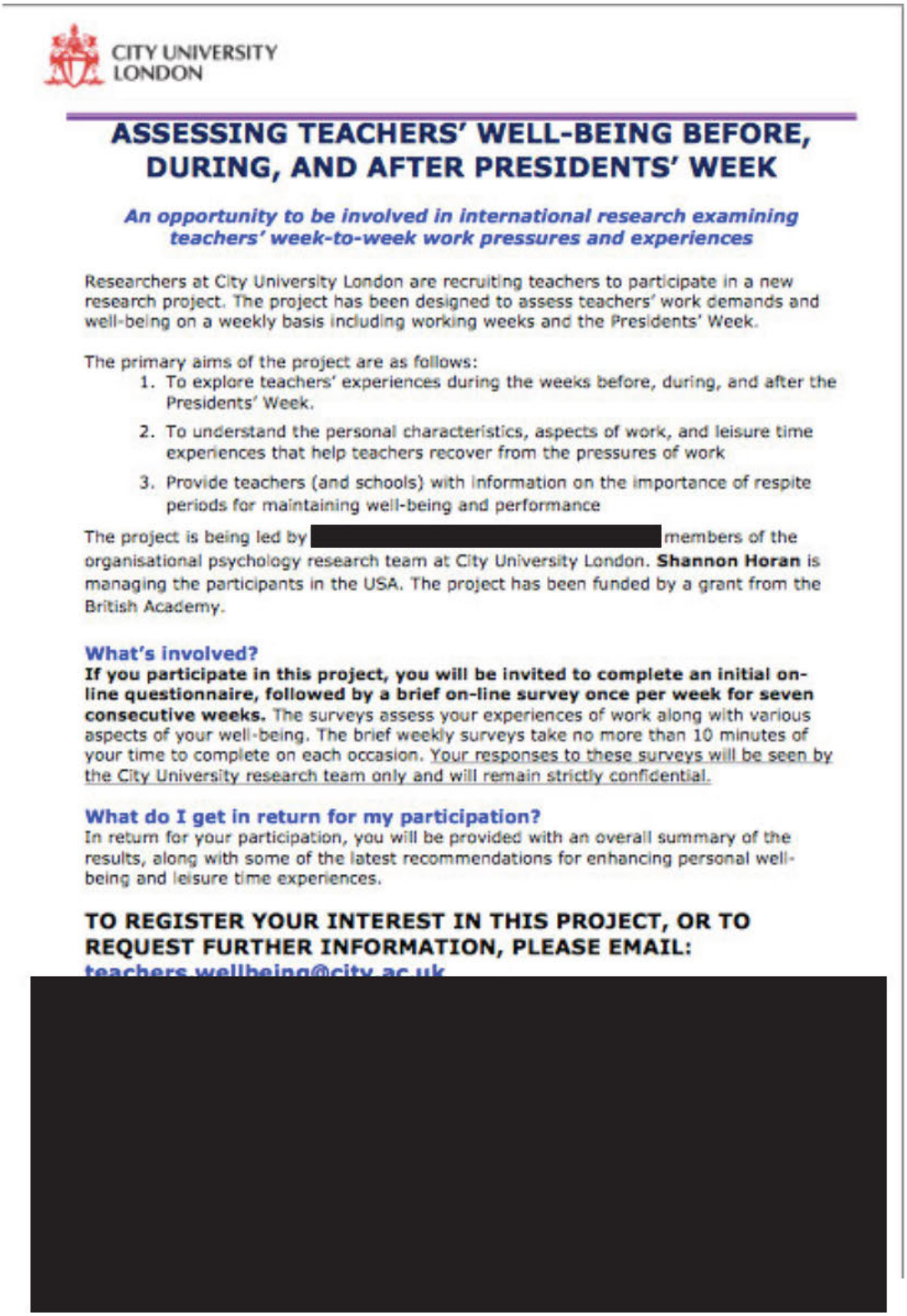
Confirmatory Factor Analysis Results for Weekly Measurement Testing for Study 2.

Week	Model	χ^2	*df*	NFI	TLI	CFI	RMSEA	$\Delta\chi^2$
1	Single Factor	646.24	65	.67	.56	.69	.18	
	Two Factor (+ & -)	408.72	64	.79	.73	.81	.14	237.52***
	Four Factor	120.75	59	.94	.95	.97	.06	287.98***
2	Single Factor	642.80	65	.69	.59	.71	.18	
	Two Factor (+ & -)	416.81	64	.79	.75	.82	.14	225.99***
	Four Factor	132.53	59	.94	.94	.96	.07	284.28***
3	Single Factor	747.86	65	.65	.54	.67	.19	
	Two Factor (+ & -)	402.86	64	.81	.77	.84	.14	345.00***
	Four Factor	118.75	59	.95	.96	.97	.06	284.10***
4	Single Factor	735.86	65	.66	.55	.68	.19	
	Two Factor (+ & -)	461.21	64	.79	.73	.81	.15	274.65***
	Four Factor	143.94	59	.93	.94	.96	.07	317.28***
5	Single Factor	745.24	65	.68	.58	.70	.19	
	Two Factor (+ & -)	400.33	64	.83	.79	.85	.14	344.91***
	Four Factor	96.60	59	.96	.97	.98	.05	303.73***
6	Single Factor	922.65	65	.60	.46	.61	.22	
	Two Factor (+ & -)	457.91	64	.80	.75	.82	.15	464.74***
	Four Factor	150.09	59	.94	.94	.96	.07	307.82***
7	Single Factor	965.92	65	.62	.48	.63	.22	
	Two Factor (+ & -)	426.61	64	.83	.79	.85	.14	539.31***
	Four Factor	128.39	59	.95	.96	.97	.07	298.22***

Note. +: Positive affective wellbeing. -: Negative affect. ***$p < .001$.

Teacher Research Documents

Recruitment Flyer



CITY UNIVERSITY LONDON

ASSESSING TEACHERS' WELL-BEING BEFORE, DURING, AND AFTER PRESIDENTS' WEEK

An opportunity to be involved in international research examining teachers' week-to-week work pressures and experiences

Researchers at City University London are recruiting teachers to participate in a new research project. The project has been designed to assess teachers' work demands and well-being on a weekly basis including working weeks and the Presidents' Week.

The primary aims of the project are as follows:

1. To explore teachers' experiences during the weeks before, during, and after the Presidents' Week.
2. To understand the personal characteristics, aspects of work, and leisure time experiences that help teachers recover from the pressures of work
3. Provide teachers (and schools) with information on the importance of respite periods for maintaining well-being and performance

The project is being led by [redacted] members of the organisational psychology research team at City University London. **Shannon Horan** is managing the participants in the USA. The project has been funded by a grant from the British Academy.

What's involved?

If you participate in this project, you will be invited to complete an initial on-line questionnaire, followed by a brief on-line survey once per week for seven consecutive weeks. The surveys assess your experiences of work along with various aspects of your well-being. The brief weekly surveys take no more than 10 minutes of your time to complete on each occasion. Your responses to these surveys will be seen by the City University research team only and will remain strictly confidential.

What do I get in return for my participation?

In return for your participation, you will be provided with an overall summary of the results, along with some of the latest recommendations for enhancing personal well-being and leisure time experiences.

TO REGISTER YOUR INTEREST IN THIS PROJECT, OR TO REQUEST FURTHER INFORMATION, PLEASE EMAIL:

[redacted]

Initial Survey

Information About the Teacher Well-Being Research

Please read these points before you begin completing your surveys:

- The aim of this research is to assess teachers' well-being across several weeks of the school term (including the half-term break).
- Participation in this research involves completing an **initial online survey** that assesses various aspects of your work and personality characteristics. This initial survey takes approximately 10 to 15 minutes to complete, and needs to be completed at some point during the week of the.
- Following the initial survey, you are invited to complete briefer **well-being surveys at the end of seven consecutive weeks** (ideally on a Friday at the end of the work day or first thing Saturday morning). Each of these weekly well-being surveys takes around 5 to 10 minutes to complete on each occasion. These surveys are designed to capture your levels of well-being during work weeks and during the week of the half-term break. Specifically, you are invited to complete your weekly surveys on the following dates:
  If it is helpful, the research team can send you weekly reminders by email
- Once the project is completed you will be sent a summary of the findings, along with some recommendations on ways to enhance your well-being during work and non-work weeks. The research team hopes to publish the findings of this project in academic journals, and communicate the results and recommendations to other schools and teachers across the UK.
  On the next page you will find on some further information on data confidentiality and how your anonymity will be protected.

Information About the Teacher Well-Being Research

- Your personal responses to these surveys will only be seen by researchers at City University London. No-one else will ever know how you personally responded.
- A reference number will be allocated to you by the research team. This number will be linked to your electronic survey data (rather than your name or email address) to ensure anonymity and data confidentiality.
- When the results of this research are communicated and published, no information will be included that could identify you as a participant
- Your participation in this research is entirely voluntary. If you do not want to complete the surveys you do not have to. Also, you may withdraw from the project at any stage without having to explain why.
- If you have any questions or concerns about the research please do not hesitate to contact the research team via the dedicated email address (teacher.wellbeing@city.ac.uk).

Thank you for your participation.

Note. This study has been approved by City University London Psychology Department Research Ethics Committee.

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through the University complaints procedure. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: Assessing teachers' well-being before, during, and after the half-term break.

You could also write to the Secretary at:

[redacted], *Secretary to Senate Research Ethics Committee, Research Office, E214, City University London, Northampton Square, London, EC1V 0HB.*

Email: [redacted]

- Please click here to confirm that you have read the above points, that you are 18 years or older, and that you wish to proceed to the initial survey.

INITIAL SURVEY

FEATURES OF YOUR JOB

The following statements ask you about your job. Please indicate your answer by clicking your response to the right hand side of every statement.

How often do you find yourself meeting the following problems in carrying out your job?

	Not at all	Just a little	Moderate amount	Quite a lot	A great deal
I do not have enough time to carry out my work.	☐	☐	☐	☐	☐
I cannot meet all the conflicting demands made on my time at work.	☐	☐	☐	☐	☐
I never finish work feeling I have completed everything I should.	☐	☐	☐	☐	☐
I am asked to do work without adequate resources to complete it.	☐	☐	☐	☐	☐
I cannot follow best practice in the time available.	☐	☐	☐	☐	☐
I am required to do basic tasks which prevent me completing more important ones.	☐	☐	☐	☐	☐

In your job, to what extent can you……

	Not at all	Just a little	Moderate amount	Quite a lot	A great deal
Determine the methods and procedures you use in your work?	☐	☐	☐	☐	☐
Choose what work you will carry out?	☐	☐	☐	☐	☐
Decide when to take a break?	☐	☐	☐	☐	☐
Vary how you do your work?	☐	☐	☐	☐	☐
Plan your own work?	☐	☐	☐	☐	☐
Carry out your work in the way you think best?	☐	☐	☐	☐	☐
Count on your colleagues to listen to you when you need to talk about problems at work?	☐	☐	☐	☐	☐
Count on your colleagues to back you up at work?	☐	☐	☐	☐	☐

Count on your colleagues to help you with a difficult task at work?	☐	☐	☐	☐	☐

Below you will find a series of statements about your work with which you may agree or disagree. Please indicate your level of agreement by clicking your response to the right hand side of every statement.

1 Strongly disagree, 2 disagree, 3 agree, 4 strongly agree

I always find new and interesting aspects in my work

There are days when I feel tired before I arrive at work.

I frequently talk about my work in a negative way.

After work, I tend to need more time than in the past in order to relax and feel better.

I can tolerate the pressure of my work very well.

Lately, I tend to think less at work and do my job almost mechanically.

I find my work to be a positive challenge

During my work, I often feel emotionally drained.

Over time, one can become disconnected from this type of work.

After my work, I have enough energy for my leisure activities.

Sometimes I feel sickened by my work tasks.

After my work, I regularly feel worn out and weary.

This is the only type of work that I can imagine myself doing.

Usually, I can manage the amount of my work well.

I feel more and more engaged in my work.

When I work, I usually feel energized.

FEATURES OF YOUR PERSONALITY

The next items assess some of the most common personality characteristics. Please indicate how well each item describes your own personality by clicking your level of agreement.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I see myself as someone who					
... is reserved	☐	☐	☐	☐	☐
... is generally trusting	☐	☐	☐	☐	☐
... tends to be lazy	☐	☐	☐	☐	☐

… is relaxed, handles stress well	☐	☐	☐	☐	☐
… has few artistic interests	☐	☐	☐	☐	☐
… is outgoing, sociable	☐	☐	☐	☐	☐
… tends to find fault with others	☐	☐	☐	☐	☐
… does a thorough job	☐	☐	☐	☐	☐
… gets nervous easily	☐	☐	☐	☐	☐
… has an active imagination	☐	☐	☐	☐	☐
… is considerate and kind to almost everyone	☐	☐	☐	☐	☐

YOUR GOALS AND PERFORMANCE EXPECTATIONS

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you strongly agree, click 7. If you strongly disagree, click 1. If you feel somewhere in between, click one of the numbers between 1 and 7. If you feel neutral or undecided, the midpoint is 4.

	Strongly Disagree (1)	(2)	(3)	Neutral (4)	(5)	(6)	Strongly Agree (7)
Anything that I do that is less than excellent will be seen as poor work by those around me.	☐	☐	☐	☐	☐	☐	☐
Although they may not show it, other people get very upset with me when I slip up.	☐	☐	☐	☐	☐	☐	☐
People expect nothing less than perfection from me.	☐	☐	☐	☐	☐	☐	☐
I am seldom able to meet my own high standards for performance.	☐	☐	☐	☐	☐	☐	☐
My performance rarely measures up to my standards.	☐	☐	☐	☐	☐	☐	☐
I am	☐	☐	☐	☐	☐	☐	☐

perfectionistic in setting my goals.							
My family expects me to be perfect.	☐	☐	☐	☐	☐	☐	☐
I must always be successful at work.	☐	☐	☐	☐	☐	☐	☐
I am not satisfied, even when I know I have done my best.	☐	☐	☐	☐	☐	☐	☐
I strive to be as perfect as I can be.	☐	☐	☐	☐	☐	☐	☐
One of my goals is to be perfect in everything I do.	☐	☐	☐	☐	☐	☐	☐
I am hardly ever satisfied with my own performance.	☐	☐	☐	☐	☐	☐	☐
I feel that people are too demanding of me.	☐	☐	☐	☐	☐	☐	☐
I set very high standards for myself.	☐	☐	☐	☐	☐	☐	☐
I rarely live up to my high standards.	☐	☐	☐	☐	☐	☐	☐

YOUR GOALS AND PERFORMANCE EXPECTATIONS

Below you will find another set of statements about your goals and performance expectations. Please rate your level of agreement to indicate how well each statement describes you.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
If I fail at work, I am a failure as a person.	☐	☐	☐	☐	☐
If someone does a task at	☐	☐	☐	☐	☐

work better than I, then I feel like I failed the whole task.					
I have extremely high goals.	☐	☐	☐	☐	☐
I usually have doubts about the simple everyday things I do.	☐	☐	☐	☐	☐
If I do not do as well as other people, it means I am an inferior human being.	☐	☐	☐	☐	☐
I expect higher performance in my daily tasks than most people.	☐	☐	☐	☐	☐
Even when I do something very carefully, I often feel that it is not quite right.	☐	☐	☐	☐	☐
I tend to get behind in my work because I repeat things over and over.	☐	☐	☐	☐	☐

Continued.....

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
If I fail partly, it is as bad as being a complete failure.	☐	☐	☐	☐	☐
The fewer mistakes I make, the more people will like me.	☐	☐	☐	☐	☐
It is important to me that I be thoroughly competent in everything I do.	☐	☐	☐	☐	☐
I set higher goals for myself than most people.	☐	☐	☐	☐	☐
Other people seem to accept lower standards from themselves that I do.	☐	☐	☐	☐	☐

YOUR BACKGROUND DETAILS

This information is required for statistical purposes only. Please complete all of the sections below.

Your age: _____

Gender (please circle one option): Male Female

Marital Status (please circle one option):

Single	Married/ Partner
Widowed	Divorced/ Separated

Please circle one of the following options to indicate the number of children living in your household and/ or for whom you have parental responsibility:

0 children
1 child
2 children
3 or more children

If you are a parent, please indicate the approximate ages of your children (tick all the options that apply):

- I am a parent to children under the age of 5
- I am a parent to children aged between 5 and 9
- I am a parent to children aged between 10 and 16
- I am a parent to children/ young adults aged 17 and over

How long have you been a teacher? (to the nearest year)_____

How long have you worked in your current school or institution? (to the nearest year)_____

Which level do you teach? (Please circle one or more of the following options):

- **Primary school**
- **Secondary school**
- **Further Education College**
- **Other (please state)**_____

Approximately how many hours do you work in a typical working week? (please include any overtime hours in your estimation)

_____

Do you work full-time or part-time? FT PT

Please select one of the following options to indicate the approximate level of your current role with your school or institution:

Non-managerial role	☐
Mid-level manager or leader (e.g., head of year, head of department)	☐
Senior leader (e.g., head of school)	☐

THANK YOU FOR COMPLETING YOUR INITIAL SURVEY. THAT WAS THE LONGEST SURVEY FOR THIS PROJECT. YOUR WEEKLY SURVEYS TAKE ABOUT 5 TO 10 MINUTES TO COMPLETE ON EACH OCCASION.

PLEASE REMEMBER TO COMPLETE YOUR WEEK 1 SURVEY NEXT FRIDAY, AS SOON AS POSSIBLE AFTER WORK THAT DAY.

(or as soon as possible on the morning of Saturday so that you can reflect back on the past working week)

Working Week Surveys

WORKING WEEK SURVEYS

PLEASE COMPLETE THESE SURVEYS SOON AS POSSIBLE AFTER YOU FINISH WORK ON FRIDAYS (or early as possible on Saturday morning so that you can reflect back over the past working week)

HOW YOU FELT OVER THIS PAST WORKING WEEK

Below you will find a list of words that describe different feelings and emotions.
Please place a tick to the right of every word, to indicate how much you experienced each of these feelings/ emotions during past working week (i.e., Monday through to Friday).
Over this past working week I have felt……..

	Not at all	A little	Moderately	Quite a bit	Extremely
Anxious	☐	☐	☐	☐	☐
Depressed	☐	☐	☐	☐	☐
Excited	☐	☐	☐	☐	☐
Tired	☐	☐	☐	☐	☐
Worried	☐	☐	☐	☐	☐
Nervous	☐	☐	☐	☐	☐
Fatigued	☐	☐	☐	☐	☐
Miserable	☐	☐	☐	☐	☐
Alert	☐	☐	☐	☐	☐
Active	☐	☐	☐	☐	☐
Attentive	☐	☐	☐	☐	☐
Energetic	☐	☐	☐	☐	☐
Relaxed	☐	☐	☐	☐	☐
Calm	☐	☐	☐	☐	☐
Tense	☐	☐	☐	☐	☐
Sad	☐	☐	☐	☐	☐
Gloomy	☐	☐	☐	☐	☐
Enthusiastic	☐	☐	☐	☐	☐
Inspired	☐	☐	☐	☐	☐

The next four items ask you to rate your sense of energy or vitality over this past week (i.e., Monday through to Friday).

Over this past working week…….

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I felt energetic.	☐	☐	☐	☐	☐	☐
I had a feeling of vitality.	☐	☐	☐	☐	☐	☐
I felt alert and awake.	☐	☐	☐	☐	☐	☐
I felt energized.	☐	☐	☐	☐	☐	☐

The statements below describe different types of feelings and other experiences that can be induced by work.
Focusing on how you felt over this past working week (i.e., Monday to Friday), please indicate how much you agree or disagree with each of the statements
Over this past working week……

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I was immersed in my work.	☐	☐	☐	☐	☐	☐
I felt burned out from my work.	☐	☐	☐	☐	☐	☐
I became more cynical about whether my work contributes anything.	☐	☐	☐	☐	☐	☐
When I got up each morning, I felt like going to work.	☐	☐	☐	☐	☐	☐
I felt that I'm working too hard on my job.	☐	☐	☐	☐	☐	☐
I felt frustrated by my job.	☐	☐	☐	☐	☐	☐
I felt emotionally drained from my work.	☐	☐	☐	☐	☐	☐
I felt happy when I was working intensely.	☐	☐	☐	☐	☐	☐
I felt like I was 'at the end of my rope'.	☐	☐	☐	☐	☐	☐
I doubted the significance of my work.	☐	☐	☐	☐	☐	☐
I felt I was not capable of being sympathetic to others.	☐	☐	☐	☐	☐	☐
I worried that my job is hardening me emotionally.	☐	☐	☐	☐	☐	☐

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
My job inspired me.	☐	☐	☐	☐	☐	☐
I was enthusiastic about my job.	☐	☐	☐	☐	☐	☐
I felt bursting with energy.	☐	☐	☐	☐	☐	☐
I felt unable to be sensitive to the needs of others.	☐	☐	☐	☐	☐	☐

JOB-RELATED PRESSURES OVER THIS PAST WEEK

The next items ask you about some specific job-related challenges that can sometimes or often be experienced by teachers. Please tick your level of agreement with each item to indicate how strongly you experienced these pressures or problems **at work over this past week**.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
Little time to prepare.	☐	☐	☐	☐	☐	☐
Too much admin/ paperwork.	☐	☐	☐	☐	☐	☐
Too much work to do.	☐	☐	☐	☐	☐	☐
Pace of school day was too fast.	☐	☐	☐	☐	☐	☐
Had some discipline problems in your classes.	☐	☐	☐	☐	☐	☐
Teaching pupils who were poorly motivated.	☐	☐	☐	☐	☐	☐
Had your authority undermined by pupils or colleagues.	☐	☐	☐	☐	☐	☐

The following six questions ask you about certain types of feelings you may or may not have experienced over this past working week (i.e., from Monday to Friday). Please indicate your response to each of these questions by circling the appropriate number between 1 and 7.

How **effective** did you feel when performing tasks over the past week? (please circle one number between 1 and 7).

1	2	3	4	5	6	7
Not very effective						Very effective

How **competent** did you feel over this past week?

1	2	3	4	5	6	7
Not very competent						Very competent

How much **freedom and choice** did you have over the things you did over the past week?

1	2	3	4	5	6	7
Very little						A great deal

To what extent did you feel you were pursuing **your own goals** over the past week?

1	2	3	4	5	6	7
Very little						A great deal

To what extent did you feel **close and connected** to the people you were with over the past week?

1	2	3	4	5	6	7
Very little						A great deal

To what extent did you feel **understood and appreciated** by others over the past week?

1	2	3	4	5	6	7
Very little						A great deal

THANK YOU FOR COMPLETING YOUR WEEK 1 SURVEY!
PLEASE REMEMBER TO COMPLETE YOUR WEEK 2 (WORKING WEEK) SURVEY NEXT FRIDAY (), AS SOON AS POSSIBLE AFTER WORK THAT DAY
(or as soon as possible on morning of Saturday so that you can reflect back on the past working week)

Vacation Week Survey

HALF-TERM WEEK SURVEYS

PLEASE COMPLETE THESE SURVEYS IN THE AFTERNOON OR EVENING ON FRIDAY OF HALF-TERM WEEK
(or early as possible on Saturday morning so that you can reflect back over the past half-term week)

HOW YOU FELT OVER THE HALF-TERM WEEK

Below you will find a list of words that describe different feelings and emotions.
Please place a tick to the right of every word, to indicate how much you experienced each of these feelings/ emotions during the half-term week (i.e., Monday through to Friday).
Over this half-term week I have felt……..

	Not at all	A little	Moderately	Quite a bit	Extremely
Anxious	☐	☐	☐	☐	☐
Depressed	☐	☐	☐	☐	☐

Excited	☐	☐	☐	☐	☐
Tired	☐	☐	☐	☐	☐
Worried	☐	☐	☐	☐	☐
Nervous	☐	☐	☐	☐	☐
Fatigued	☐	☐	☐	☐	☐
Miserable	☐	☐	☐	☐	☐
Alert	☐	☐	☐	☐	☐
Active	☐	☐	☐	☐	☐
Attentive	☐	☐	☐	☐	☐
Energetic	☐	☐	☐	☐	☐
Relaxed	☐	☐	☐	☐	☐
Calm	☐	☐	☐	☐	☐
Tense	☐	☐	☐	☐	☐
Sad	☐	☐	☐	☐	☐
Gloomy	☐	☐	☐	☐	☐
Enthusiastic	☐	☐	☐	☐	☐
Inspired	☐	☐	☐	☐	☐

The next four items ask you to rate your sense of energy or vitality over this past week (i.e., Monday through to Friday).
Over this half-term week…….

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I felt energetic.	☐	☐	☐	☐	☐	☐
I had a feeling of vitality.	☐	☐	☐	☐	☐	☐
I felt alert and awake.	☐	☐	☐	☐	☐	☐
I felt energized.	☐	☐	☐	☐	☐	☐

The statements below describe different types of feelings and other experiences that can be induced by work.
Focusing on how you felt over this past HALF-TERM week (Monday to Friday), please indicate how much you agree or disagree with each of the statements.
Over this half-term week……

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I felt burned out from my work.	☐	☐	☐	☐	☐	☐
I became more cynical about whether my work contributes	☐	☐	☐	☐	☐	☐

anything.						
I felt that I'm working too hard on my job.	☐	☐	☐	☐	☐	☐
I felt frustrated by my job.	☐	☐	☐	☐	☐	☐
I felt emotionally drained from my work.	☐	☐	☐	☐	☐	☐
I felt like I was 'at the end of my rope'.	☐	☐	☐	☐	☐	☐
I doubted the significance of my work.	☐	☐	☐	☐	☐	☐
I felt I was not capable of being sympathetic to others.	☐	☐	☐	☐	☐	☐
I worried that my job is hardening me emotionally.	☐	☐	☐	☐	☐	☐
	Strongly Disagree	**Disagree**	**Slightly Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
I felt unable to be sensitive to the needs of others.	☐	☐	☐	☐	☐	☐

We are interested in any <u>thoughts about work</u> you experienced during the half-term week. Please indicate the degree to which you experienced the types of work-related thoughts listed below.
During the half-term week……

	Not at all	Just a little	Moderate amount	Quite a lot	A great deal
I thought positively about my work performance.	☐	☐	☐	☐	☐
I repeatedly thought about something that had upset me at work.	☐	☐	☐	☐	☐
I worried about how I would deal with a work task or issue.	☐	☐	☐	☐	☐
I reflected on things that	☐	☐	☐	☐	☐

have gone well for me in my job.					
I worried about things I need to do at work.	☐	☐	☐	☐	☐
My thoughts kept returning to a stressful situation at work.	☐	☐	☐	☐	☐
I had constructive thoughts about a work project or work in general.	☐	☐	☐	☐	☐
I worried about things to do with work.	☐	☐	☐	☐	☐
I found myself dwelling on problems related to my work.	☐	☐	☐	☐	☐
I was concerned about mistakes I have made (or might make) at work.	☐	☐	☐	☐	☐

During the half-term week, approximately how many hours did you spend on work-related activities (e.g., actually working, checking work emails, preparing or finishing work, speaking to colleagues about work, etc.)?
Please record your answer here to the nearest hour: _____
Please indicate your <u>main location</u> during the half-term week (click all the options that apply):

- I stayed at my usual home
- I stayed with family or friends
- I went away on holiday (in the UK)
- I went away on holiday (abroad)
- Other (please state)_____

The following six questions ask you about certain types of feelings you may or may not have experienced over this half-term week (i.e., from Monday to Friday).
Please indicate your response to each of these questions <u>by circling the appropriate number between 1 and 7.</u>
How **effective** did you feel when performing tasks over the past week? (please circle one number between 1 and 7).

1	2	3	4	5	6	7
Not very effective						Very effective

How **competent** did you feel over this past week?

1	2	3	4	5	6	7
Not very competent						Very competent

How much **freedom and choice** did you have over the things you did over the past week?

1	2	3	4	5	6	7
Very little						A great deal

To what extent did you feel you were pursuing **your own goals** over the past week?

1	2	3	4	5	6	7
Very little						A great deal

To what extent did you feel **close and connected** to the people you were with over the past week?

1	2	3	4	5	6	7
Very little						A great deal

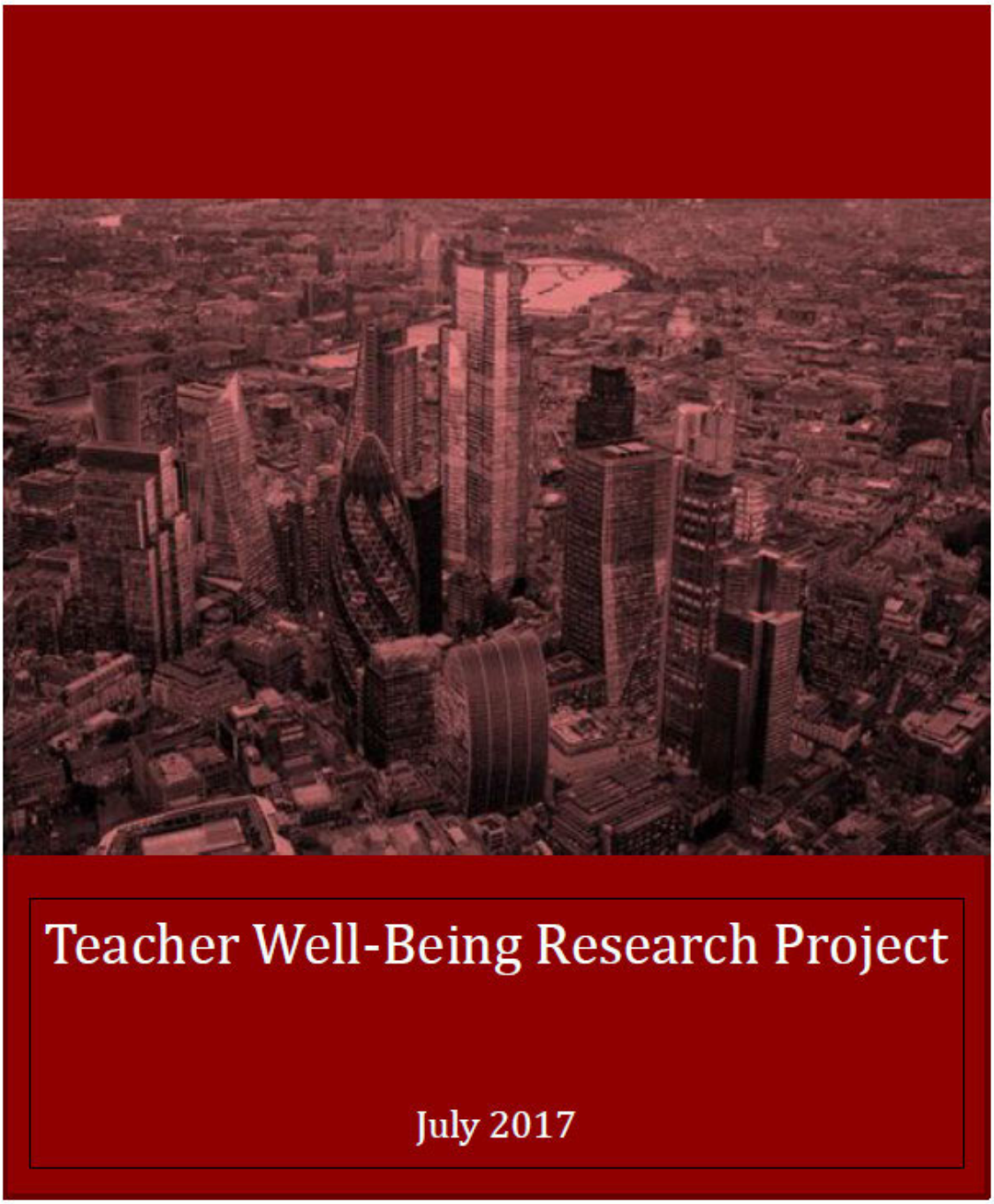
To what extent did you feel **understood and appreciated** by others over the past week?

1	2	3	4	5	6	7
Very little						A great deal

THANK YOU FOR COMPLETING YOUR WEEK 3 (HALF-TERM) SURVEY!

PLEASE REMEMBER TO COMPLETE YOUR WEEK 4 (WORKING WEEK) SURVEY NEXT FRIDAY (), AS SOON AS POSSIBLE AFTER WORK THAT DAY

(or as soon as possible on the morning of so that you can reflect back on the past working week)


Teacher Well-Being Research Project
July 2017

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Introduction

RECOVERY FROM WORK

In both the United Kingdom and United States, workplace stress continues to be at the forefront of concerns for employees' mental and physical health. To investigate workplace stress further, there has been an increasing interest into how people recover from stress during breaks from work. Non-work periods, whether it is the evening, weekend, or a vacation, offer the opportunity for employees to recover from work-related stress. Additionally, holidays and vacations are seen as a perfect time for employees to rejuvenate and restore their working capacities.

TEACHER STRESS

When looking at working populations, teaching continues to be one of the most stressful occupations. Research has found that 76% of teachers believe that their levels of stress influence their health, with 56% stating they would be better at their job if they felt less stressed (National Union of Teachers). The Guardian newspaper found that teachers regularly work 60 hour weeks, which has led to a non-existent work-life balance, suffering relationships, and a drop in job satisfaction (Education Support Partnership). This has led to over half of teachers (52%) reporting that they have seriously considered leaving their current jobs, and 47% have considered leaving teaching all together (Teacher Toolkit).

Given these statistics, there has been growing interest in research that attempts to improve teachers' psychological well-being. One important strand of this research has been to understand whether teachers are able to use time away from work to recover from the considerable demands of the job.

Our Story

Previous research has focused on the summer and winter holiday periods, this research is specifically interested in the week long half-term breaks. These week long breaks happen a few times a year, and we are very interested in seeing how important these breaks are to teachers and their well-being. Our research design focused on this half-term break, in which we sent surveys for two weeks before the half-term break and for four working weeks after the break. This allowed for an investigation into both work and non-work weeks.

MEASURES

Our initial survey collected information on teachers' demographic information, personality, and work characteristics. Then, for seven consecutive weeks, a survey was sent each Friday to collect weekly well-being levels, burnout scores, and emotions experienced during the past week.

DATA COLLECTION

Throughout each collection period, the design remained the same. The research was conducted on many separate occasions:

2015: October Half-Term (UK)

2016: February Half-Term (UK), Presidents' Week (US), Spring Break (US), May Half-Term (UK)

2017: February Half-Term (UK), Presidents' Week (US), Spring Break (US), May Half-Term (UK)

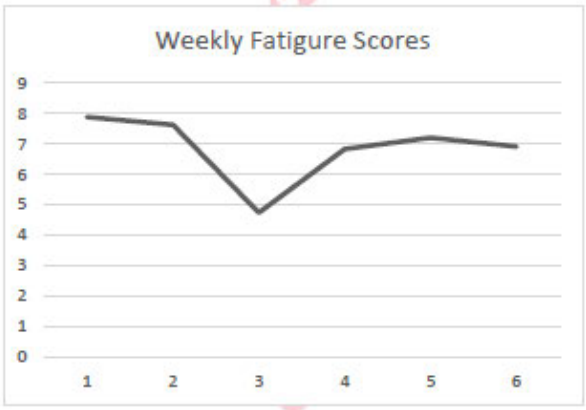
PARTICIPANTS

Participants were teachers, head teachers (principals), and teaching assistants from various schools around the United Kingdom and the United States. A total of 266 teachers participated, with the sample being predominately female (87.5%) and having an average age of 40. The teachers had an average tenure of 13.66 years with 89.1% working full-time, 10% working part-time, and 1% other.

What we found

FATIGUE

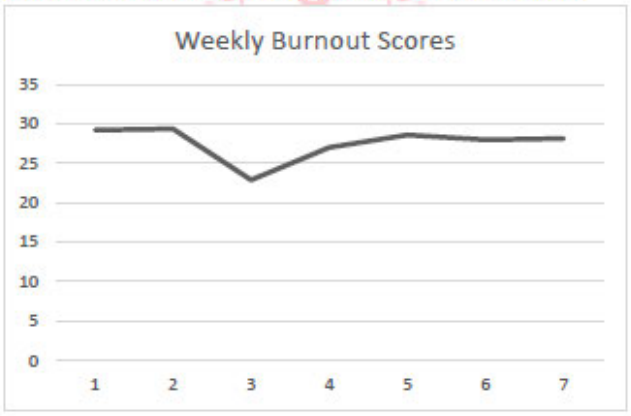
Each week we measured fatigue, which can be described as physical and/or mental exhaustion caused by work and life demands. Each Friday we asked each participant to answer how tired and fatigued they felt over the past week on a scale from 1 to 7. In the chart below, you will see the average scores for each week. Remember, the 3rd week was the half-term break.



The chart above shows the pattern of change in fatigue during the week off. There was a statistically significant drop in fatigue scores during the break. What is very interesting in this figure is that the scores for week 4 (post-break) are not as high as week 2 (pre-break). We can see that teachers are recovering from feeling fatigued and tired during the break and this continues when they return to work. As the weeks continue, we still are not seeing high scores like those from the weeks before the break. Previous research has shown that scores usually fade-out and return to pre-break levels around a month after employees return to work; but in this case, we see that teachers are still maintaining some benefits from the break.

BURNOUT

Burnout is classified as a prolonged state of stress which can cause both physical and emotional exhaustion. Just as we measured fatigue each week, we did the same for burnout. We asked participants to answer questions such as 'I felt that I'm working too hard on my job,' 'I felt frustrated by my job,' and 'I felt emotionally drained from my work.' We asked each participant to answer how much they agreed with each of the statements ranging from strongly disagree, disagree, slightly disagree, slightly agree, agree, and strongly agree. We then took these scores and gave them a value from 1 to 6. The scores from these questions were then complied to get weekly total burnout scores. In the chart below you will see the average weekly burnout scores across the seven weeks of the study (week 3 is the week off).



There was a statistically significant drop in burnout scores from week 2 (pre-break) to week 3 (during break). Again, we can see that when teachers return to work in week 4, their levels are not quite as high as they were before the break. There is then a gradual return to pre-break levels, which. Although, it is still important to see that there is some recovery happening for teachers during this week away from work; we will look further into possible ways we can enhance or hinder that recovery later on in this report.

EMOTIONS EXPERIENCED

Next, we looked at the different emotions teachers were experiencing each week. We were particularly interested in positive emotions like feeling excited, enthusiastic, energetic, alert, active, inspired, calm, relaxed, and attentive. We asked each participant to answer how they felt each week and for each emotion answer if they felt it not at all, a little, moderately, quite a bit, and extremely. We then took these scores and gave them a value from 1 to 5. In the chart below, you will see the average total scores for each week.

There was a statistically significant jump in positive emotions during the week away from work. What is also interesting is that the scores before the break are pretty high, possibly some excitement for the upcoming break. When returning to work in week 4, scores are still higher than pre-break scores, but then drop below the week after. This shows that the frequency of positive emotions return to their pre-break level during the second week back to work. We will explore this further, and also provide some recommendations for maintaining some "vacation-effect" when returning to work.

THE ROLE OF LEISURE TIME EXPERIENCES

In this research, we were keen to explore what was happening during the break. We were interested in understanding the experiences that might be enhancing or hindering teachers" ability to recover from workplace demands during time off. To do this we utilized a famous psychological model known as self-determination theory. This theory suggest that if people can satisfy three basic psychological needs, they will experience increased well-being. The three needs within this theory are **competence** (the feeling of having the ability to do something effectively), **autonomy** (the feeling of having control and choice in one's activities and pursuits), and **relatedness** (the feeling of being close and connected to others). Each week we asked questions like 'How competent did you feel over this past week?,' 'How much freedom and choice did you have over the things you did over the past week?,' and 'To what extent did you feel close and connected to the people you were with over the past week?' The answers were on a scale that ranged from 1 to 7. The weekly scores from each psychological need were added together to get a total psychological needs satisfaction (PNS) score each week.

In our analysis, we first wanted to see if the PNS total during the break (week 3) was related to the scores of fatigue, burnout, and positive emotion for the week that teachers returned to work (week 4). When we calculated this, we found that PNS scores during the break were negatively related to both fatigue and burnout, which means that the more PNS experienced during the break, the lower the scores for fatigue and burnout when returning to work. We also found that PNS scores during the break were positively related to positive emotions experienced during week 4, which means that the higher the PNS total, the higher the positive emotion scores when returning to work.

Our next step was to investigate whether burnout scores for week 4 (post-break) were influenced by scores of PNS during the break. As we saw in the graph above, burnout scores significantly dropped during the break. We were interested in examining whether satisfying psychological needs during the break had a strong influence on burnout when returning to work. In our analysis, we found that burnout when returning back to work was indeed influenced by PNS, even when burnout scores for the break were reduced. This means that the change in burnout from week 3 to 4 is not just destined to happen, but can be influenced by the levels of psychological needs being satisfied. Knowing this gives us insights into how people may be able to enhance their recovery from work during vacation periods.

Recommendations

With all this information, you may be asking yourself; 'Well now what?' This research, as well as previous research, allows us to offer a few simple recommendations on how to enhance the quality of time away from work.

WORRYING AND RUMINATING ABOUT WORK

Previous research has also found that worrying/ ruminating about work during non-work periods can have a negative impact on your ability to recover during a break. It has been shown that people who worry and ruminate about work during non-work times have less recovery than those that do not.

If you are prone to this type of thinking during non-work time, we would recommend mindfulness training. Research has shown that this type of training can help us to "disentangle" ourselves from unhelpful thinking patterns, and leads us to focus more on our present moment experiences. We have provided some suggested reading and other resources below.

SATISIFYING PSYCHOLOGICAL NEEDS

As mentioned above, having a sense of autonomy, competence, and relatedness during a break is key to recovering from work-related demands and pressures. One way to enhance this is to reflect on small actions that would give you more autonomy, competence, and relatedness. Take some time to ask yourself: what is it that allows you to feel you have more control and choice at work and home? What allows you to feel you have the ability to do something effectively? Which activities help you feel close and connected to others? Taking time to reflect on those actions will give you an idea of what you need to do in order to satisfy these basic psychological needs during the break and when returning to work.

It is important to add that research has shown that the size of the action isn't important, particularly in your recovery. Both large and small actions improve your well-being and ability to recover over the break. There is no need to focus on only on big actions that make you feel as though your needs are satisfied. Simply focus on a few small things that would benefit you during the break.

SMALL ACTIVITIES

In a report by De Bloom (2015), research has shown that the following small activities boost recovery during a vacation:

- Exercise on the last working day. This allows for you to release the built up work pressures so that you enter the break free of those negative influences.
- Starting work at a slower pace when you return. A lot of times we jump right back into work when we return, which will bring our well-being levels back to where they were before the break. It is important to pace yourself back into work, and not push yourself too much when you first return.
- Creating new memories during the vacation will allow you to reflect positively on your time away. Cherishing these holiday memories throughout work brings you back to those times and will enhance and prolong the vacation effects.

MINDFULNESS RESOURCES

If you are interested in learning more about mindfulness training, we would recommend the following resources.

The UK's Mental Health Foundation provides a lot of useful information about mindfulness skills and courses, including an on-line course if you want to practice in your own time: https://www.mentalhealth.org.uk/our-work/mindfulness

One of the most respected books written on mindfulness is "Finding Peace in a Frantic World", by Prof Mark Williams and Dr. Danny Penman. The book includes free access to some excellent recordings of mindfulness exercises: http://franticworld.com/

Finally the HeadSpace phone app is highly regarded, and can help you build mindfulness practices into your everyday life: https://www.headspace.com/

From the Team

THANK YOU

The Teacher Well-Being Research Team is so extremely grateful for your participation in this research. With your participation, this project has become one of the largest international research projects on teacher well-being. The knowledge that we gain from this project is valuable, and we would not have been able to do it without your time and effort.

NEXT STEPS

We are planning to use the data collected within this project to further understand the vacation experiences of teachers. Our research director, Dr. Paul Flaxman, is looking to communicate the findings to teachers, schools, and to the psychological research community. Furthermore, for her first PhD study, Shannon Horan, is looking more closely at personality differences that might influence how teachers recover from work pressures during mid-term breaks.

We are also very interested in teachers' well-being in other aspects of their careers. Our team has been providing personal resilience training to teachers across the UK. We are currently evaluating the impact of this training on teachers' psychological health.

Finally, we have future plans to investigate both the psychological and physical well-being of teachers in upcoming research. If you are interested in staying in touch or hearing more about our future outcomes, please send an email to **teachers.wellbeing@city.ac.uk**.

Meet Our Members

Teacher Well-Being Research Team

Members of City's Organisational Psychology Research Group

City, University of London
Northampton Square
London, UK
EC1V 0HB
teachers.wellbeing@city.ac.uk

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HRV Research Documents

Recruitment Flyer

Exploring Employees' Mental and Physical Well-Being

An opportunity to be involved in research examining working, evening, and sleeping periods

Researchers at City, University of London are recruiting employees to participate in a new research project. The project has been designed to assess employees' mental and physical health over a 36 hour period.

The primary aims of the project are as follows:

1. To explore employees' wellbeing over the course of 36 hours, including during working hours, non-working hours, and during sleep.
2. To understand the personal characteristics, aspects of work, and leisure time experiences that help employees recover from the pressures of work.
3. Provide employees with information on the importance of respite periods and sleep for maintaining both mental and physical health.

The project is being run by **Shannon Horan**, a PhD student, along with her supervisor [redacted] Shannon and [redacted]re members of the organisational psychology research team at City, University of London.

What's involved?

If you decide to take part, you will be asked to wear a heart rate monitor band (see image below) and fill in 7 online surveys. A testing period (36 hours) will be arranged with the researcher, to fit as easily as possible with your schedule. Prior to this day, you will be sent an initial survey to gather information about yourself and your job. On the testing day, you will be fitted with the monitor and will then be asked to complete six brief surveys throughout the testing period (these surveys take just a few minutes to complete on each occasion). Then, you will meet with the researcher again to return the monitor, marking the end of your participation.

What do I get in return for my participation?

In return for your participation, you will be provided with a personalized report of the heart rate monitors' results, along with some of the latest recommendations for enhancing personal wellbeing, leisure time experiences, and sleep. Additionally, as a thank you for your participation, you will receive a £10 gift card.

Who can sign up?

You must be 18 years or older and be working either full-time or part-time. Due to the nature of monitoring heart rate, you must also be under the age of 60 years, and are not currently taking any medication that affects the function of your heart, and do not have a diagnosed illness that affects your heart or heart rate. You must also not be pregnant or breastfeeding, or have a formal insomnia diagnosis.

TO REGISTER YOUR INTEREST IN THIS PROJECT, OR TO REQUEST FURTHER INFORMATION, PLEASE EMAIL:

[redacted]

[redacted]

Heart rate monitor to be worn.

This study has been reviewed by, and received ethics clearance through the Psychology Research Ethics Committee City, University of London. If you would like to complain about any aspect of the study, please contact the Secretary to the Senate Research Ethics Committee on [redacted] or via [redacted]

City, University of London is the data controller for the personal data collected for this research project. If you have any data protection concerns about this research project, please contact City's Information Compliance Team at dataprotection@city.ac.uk

PARTICIPANT INFORMATION SHEET

Title of study: *Exploring Employees' Mental and Physical Wellbeing*

Name of principal investigator: *Shannon Horan (Supervised by Dr Paul Flaxman)*

We would like to invite you to take part in a research study. Before you decide whether you would like to take part, it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Feel free to ask us if there is anything that is not clear or if you would like more information.

What is the purpose of the study?
The purpose of this study is to investigate employees' mental wellbeing (using online surveys) and physical wellbeing (using a heart rate monitor) during the work day, evening, and sleep.

What will happen if I take part?
If you decide to take part, you will be asked to meet with the researcher twice, wear a heart rate monitor for roughly 36 hours, and fill in seven online surveys. The timing of the surveys is shown in the table below

In the picture above shows the heart rate band you'd be wearing. It is a research instrument, not medical equipment. It will record your physical movement and heart rate and the data will be downloaded once you return the monitor. It is worn on the chest as shown in the picture, underneath clothing, and does not involve any invasive procedures in order to be worn. The researcher will not be putting the monitor on for you, you will be putting it on yourself in private. The researcher will tell you how to put on the monitor and how to remove the band.

The testing day will be arranged to fit into your schedule. It will begin with a meeting with the researcher (Ms. Shannon Horan) at the end of your working day, either at the University or within your organisation's offices. At this first meeting, the researcher will show you how to wear the monitor, and provide information about the testing period.

You will also be asked to complete a total of 7 surveys while participating in this research project. You be asked to first fill in an initial survey, sent one week before the

testing, and then 6 brief surveys throughout your 36 hours while you wear the monitor. The timings of these surveys are in the table above.

Finally, you will meet with the researcher to return the monitor. This again will be arranged to fit your schedule and shouldn't take long.

Why have I been invited?

You have been invited because you have voiced some interest in the research project. You have also been chosen because you are:

- *Between the ages of 18 and 60*
- *Employed either part-time or full-time*
- *Not taking medication that impacts your heart function; and you do not have a diagnosed illness that affects your heart*
- *Not pregnant or breastfeeding*
- *Do not have a known insomnia diagnosis.*

*If you **do not** meet these requirements, you will unfortunately not be eligible to participate.*

What are the possible benefits of taking part?

Benefits of taking part include:
-Receive a personalized report about your unique heart rate recordings
-Receive a £10 giftcard as a thank you for your participation
-Gain insight into your own mental and physical well-being during a typical working day
-Contribute to academic research on employee health and well-being

What are the possible disadvantages/risks of taking part?

The only risk in wearing this equipment is mild discomfort, but you will be instructed on how to adjust and remove the monitor and strap if you experience any discomfort. The researchers encourage the removal of the equipment if it causes a lot of discomfort.
You will also have to take time out of your days to meet with the researcher and complete the online surveys (the surveys take about 5-10 minutes to complete on each occasion).

Will my taking part in the study be kept confidential?

Yes, all the information you supply throughout the study will be kept strictly confidential. Only the research team will have access to any of the research data. Once the data is collected, it will be anonymized and all previous identifying information about you will be deleted. A reference number will be allocated to you by the research team. This number will be linked to your electronic survey data (rather than your name or email address) to ensure anonymity and data confidentiality.When the results of this research are communicated and published, no information will be included that could identify you as a participant.

What will happen to results of the research study?

The results will be used as part of a current PhD thesis being conducted by the researcher. Upon completion, this thesis will be made available publicly on the City Research Online website. Any individual identifying information will not be included in any of the final results. It is also hoped that the findings will be published in psychology journals. Again, no individual information will be identified at any stage of the publication process.

What will happen if I do not want to carry on with the study?

You can choose to withdraw from the study, at any point, without giving any explanation.

Who has reviewed the study?

This study has been approved by City, University of London Psychology Research Ethics Committee.

Further information and contact details

If you have any questions about the study, please do not hesitate to contact Shannon Horan [redacted] *or* [redacted]

Data Protection Privacy Notice: What are my rights under the data protection legislation?

City, University of London is the data controller for the personal data collected for this research project. Your personal data will be processed for the purposes outlined in this

notice. The legal basis for processing your personal data will be that this research is a task in the public interest, that is City, University of London considers the lawful basis for processing personal data to fall under Article 6(1)(e) of GDPR (public task) as the processing of research participant data is necessary for learning and teaching purposes and all research with human participants by staff and students has to be scrutinised and approved by one of City's Research Ethics Committees. For more information, please visit www.city.ac.uk/about/city-information/legal

What if I have concerns about how my personal data will be used after I have participated in the research?
In the first instance you should raise any concerns with the research team, but if you are dissatisfied with the response, you may contact the Information Compliance Team at dataprotection@city.ac.uk or phone 0207 040 4000, who will liaise with City's Data Protection Officer Dr William Jordan to answer your query. If you are dissatisfied with City's response you may also complain to the Information Commissioner's Office at www.ico.org.uk

What if there is a problem?
If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through City's complaints procedure. To complain about the study, you need to phone [redacted]. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: Exploring Employees' Mental and Physical Wellbeing

You could also write to the Secretary at:
[redacted]
Research Governance & Integrity Manager
Research & Enterprise
City, University of London
Northampton Square
London
EC1V 0HB
[redacted]

City holds insurance policies which apply to this study. If you feel you have been harmed or injured by taking part in this study you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone's negligence, then you may have grounds for legal action.

Thank you for taking the time to read this information sheet.

PSYETH (R/L) 17/18 215

CONSENT FORM FOR HEART RATE DATA

Title of Study: Exploring Employees' Mental and Physical Wellbeing

		Please initial box
1	I confirm that I have had the project explained to me, and I have read the participant information sheet, which I may keep for my records.	
2	I understand this will involve wearing a heart rate monitor that will collect data on my heart rate and physical activity.	
3	This information will be held by City as the data controller and processed for the following purpose(s): To first be used for Shannon Horan's PhD thesis, and then to be published in psychological journals. I understand that the thesis will be made available in the City Research Online repository, but I will not be identified in any way.	
4	I understand that any information I provide is confidential, and that no identifiable information will be collected alongside the heart rate data.	
5	I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way.	
6	I agree to City recording and processing this information about me. I understand that this information will be used only for the purpose(s) set out in this statement and my consent is conditional on City complying with its duties and obligations under the General Data Protection Regulation (GDPR).	

_____	_____	_____
Name of Participant	Signature	Date
_____	_____	_____
Name of Researcher	Signature	Date

Participant User Guide

Surveys to complete:

Use this table to keep track of the surveys you've completed and as a reminder to keep an eye out for your upcoming surveys.

Timing of Surveys	√
Day 1: One Hour Before Bed	
Day 2: Upon Awakening	
Day 2: After Work	
Day 2: One Hour Before Bed	
Day 3: Upon Awakening	
Day 3: After Work	

If there are any issues:

Please get in contact with the researcher if you have any questions or concerns about the questionnaires or wearing the strap.

[redacted]

Exploring Employees' Mental and Physical Wellbeing

A helpful information pack to guide you through this research project.

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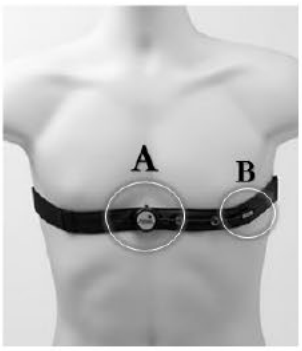
Wearing the HR Strap

- Image 1 represents the ideal placement for the strap, but can be slightly adjusted to be worn comfortably. You might find it more comfortable if you move it down a bit, but please keep A in the center of your chest and B on the left side of your body.
- This kit is commonly used in exercise research, so it will be recording your physical activity and your heart rate. There is no GPS on this kit, so feel secure in knowing that your location is private.
- The researcher cannot see your data until you return the kit. There is no way of knowing your activity or heart rate while it is worn.
- The love heart on A will flash red. This does not mean it is malfunctioning or losing battery, it simply resembles a heartbeat.
- You do not need to continue to wet the strap while it is being worn, it is only when it is removed that you will need to re-wet the band. Instructions on removal and putting the kit back on can be found to the right.
- The kit is waterproof. If you accidentally spill on yourself, rest assured that you will not be electrocuted or cause damage to the equipment. Although, we do ask you to remove the kit when you shower, bathe, or swim.
- You might find that the HR monitor unclips from the strap. If this happens, please reattach by pushing in the tab and connecting it back onto the strap.
- The kit should sit close to your chest and shouldn't be seen through clothing. We do advise not wearing tight clothing if you are concerned with the equipment being seen.
- The kits are thoroughly disinfected between each use. When the researcher collects the equipment, it will be handled with gloves.
- Lastly, this equipment belongs to the University, so we ask you to please handle it with care so it can continue to be used for further research.

1



2

Removing/Putting on the HR Monitor and Strap

If at any point the strap becomes uncomfortable, please feel free to adjust it, or take it off and put it back on. If you remove the strap (i.e. to adjust fit, when you exercise, or when you shower/bathe), please do so and follow the directions below. But, we ask you to please put the strap back on once you've finished.

Removal:
To remove the HR monitor from the strap, first push in the tab on the side of B (Image 2). You should be able to squeeze the tab in and remove B. Then do the same to the tab on the top of A. Place the HR monitor gently to the side as you remove the strap. Remove the strap by unhooking the closure that holds it together. Once removed, we ask you to please keep both in a safe and secure location.

Putting Back On:
To put the strap back on, **you must first wet the rubberized back of the strap** and hook the strap back onto your chest. You can then adjust the fit. It should fit snugly and comfortably on your chest. Make sure to line up the studs on the strap, so that they resemble Image 1 (one stud in the middle of your chest and the other on the left side of your body). Once the strap is in place, make sure that the front of the strap is not wet, and attach the heart rate monitor back onto the strap.
To attach the monitor, squeeze the tab on the top of A and fit the hole on the back onto the stud at the middle of your chest. Then squeeze the tab on B and fit it the hole onto the tab on the left side of your body. Make sure the HR monitor is positioned as shown in Image 1.

Initial Survey

Information about the Employees' Mental and Physical Wellbeing Research Project

Welcome to the first survey of the research. Please read the following points before you begin.

The aim of this research is to assess employees' mental and physical wellbeing during working, non-working, and sleeping periods. Participating in this research involves completing this initial survey, meeting the researcher twice, wearing a heart rate monitor for approximately 36 hours, and completing an additional 6 surveys while you are wearing the monitor. This initial survey takes approximately 10 to 15 minutes to complete. We request that you complete this survey as soon as you can, and MUST be completed before you meet with the researcher.

After you meet with the researcher and start wearing the heart rate monitor, you will be asked to fill in the following 6 surveys:

Day 1: One Hour Before Bed
Day 2: Upon Awakening
Day 2: After Work
Day 2: One Hour Before Bed
Day 3: Upon Awakening
Day 3: After Work

These surveys are designed to capture your levels of wellbeing at different points of your working day. It is important for our research that you try to complete the surveys at the times we ask. This will enable us to get the maximum benefits from your valued participation.

Each of the surveys will be sent to you via email. If you would like, a text message can be sent to you to alert you that the survey has been sent. If you would like to request to have text message reminders, or any other issues arise, do not hesitate to email the researcher at [redacted]

Any information you provide in these surveys is confidential. No information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published or be shared with any other organisation.

Participation in this research is voluntary, and you can choose not to participate in part or all of the project. You can withdraw at any stage of the project without being penalised or disadvantaged in any way.

Please click the circle below, followed by the arrow in the corner to move on to the survey.

Features of Your Job

The following statements ask you about your job. Please indicate your answer by clicking your response to the right hand side of each statement.

How often do you find yourself meeting the following problems in carrying out your job?

	Not at all	Just a little	Moderate amount	Quite a lot	A great deal
1. I do not have enough time to carry out my work.	O	O	O	O	O
2. I cannot meet all the conflicting demands made on my time at work.	O	O	O	O	O
3. I never finish work feeling I have completed everything I should.	O	O	O	O	O
4. I am asked to do work without adequate resources to complete it.	O	O	O	O	O
5. I cannot follow best practice in the time available.	O	O	O	O	O
6. I am required to do basic tasks which prevent me completing more important ones.	O	O	O	O	O

In your job, to what extent do you...

	Not at all	Just a little	Moderate amount	Quite a lot	A great deal
1. Determine the methods and procedures you use in your work?	O	O	O	O	O
2. Choose what work you will carry out?	O	O	O	O	O
3. Decide when to take a break?	O	O	O	O	O
4. Vary how you do your work?	O	O	O	O	O
5. Plan your own work?	O	O	O	O	O
6. Carry out your work in the way you think best?	O	O	O	O	O

To what extent can you count on your immediate superior...

	Not at all	To a small extent	Neither great nor small extent	To a great extent	Completely
1. To listen to you when you need to talk about your problems at work?	O	O	O	O	O
2. To help you with a difficult task at work?	O	O	O	O	O

To what extent can you...

	Not at all	Just a little	Moderate amount	Quite a lot	A great deal
1. Count on your colleagues to listen to you when you need to talk about problems at work?	O	O	O	O	O
2. Count on your colleagues to back you up at work?	O	O	O	O	O
3. Count on your colleagues to help you with a difficult task at work?	O	O	O	O	O
4. Really count on your colleagues to help you in a crisis situation at work, even though they would have to go out of their way to do so?	O	O	O	O	O

Your Goals and Performance Expectations

The next set of questions ask more about your personal goals and performance expectations, not those of your job or organisation. Listed below is a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you strongly agree, click 7. If you strongly disagree, click 1. If you feel somewhere in between, click one of the numbers between 1 and 7. If you feel neutral or undecided, the midpoint is 4.

	Disagree (1)	(2)	(3)	(4)	(5)	(6)	Agree (7)
1. Anything that I do that is less than excellent will be seen as poor work by those around me	O	O	O	O	O	O	O
2. Although they may not show it, other people get very upset with me when I slip up	O	O	O	O	O	O	O
3. People expect nothing less than perfection from me	O	O	O	O	O	O	O
4. I am perfectionistic in setting goals	O	O	O	O	O	O	O
5. My family expects me to be perfect	O	O	O	O	O	O	O
6. I must always be successful at work	O	O	O	O	O	O	O
7. I strive to be as perfect as I can be	O	O	O	O	O	O	O
8. One of my goals is to be perfect in everything I do	O	O	O	O	O	O	O
9. I feel that people are too demanding of me	O	O	O	O	O	O	O
10. I set very high standards for myself	O	O	O	O	O	O	O

Below you will find another set of statements about your goals and performance expectations. Please rate your level of agreement to indicate how well each statement describes you.

	Strongly disagree	Disagree	Neither agree not disagree	Agree	Strongly agree
1. If I fail at work, I am a failure as a person	O	O	O	O	O
2. If someone does a task at work better than I, then I feel like I failed the whole task	O	O	O	O	O
3. I have extremely high goals	O	O	O	O	O
4. I usually have doubts about the simple everyday things I do	O	O	O	O	O
5. If I do not do as well as other people, it means I am an inferior human being	O	O	O	O	O
6. I expect higher performance in my daily tasks than most people	O	O	O	O	O
7. Even when I do something very carefully, I often feel that it is not quite right	O	O	O	O	O
8. I tend to get behind in my work because I repeat things over and over	O	O	O	O	O
9. If I fail partly, it is as bad as being a complete failure	O	O	O	O	O
10. The fewer mistakes I make, the more people will like me	O	O	O	O	O
11. It is important to me that I be thoroughly competent in everything I do	O	O	O	O	O
12. I set higher goals for myself than most people	O	O	O	O	O
13. Other people seem to accept lower standards than I do	O	O	O	O	O

Features of Your Personality

The next items assess some of the most common personality characteristics. Please indicate how well each item describes your own personality by clicking your level of agreement to the right of each statement.

	Strongly disagree (1)	(2)	(3)	(4)	(5)	(6)	Strongly Agree (7)
I see myself as someone who... 1. ...is reserved	O	O	O	O	O	O	O
2. ...is considerate and kind to almost everyone	O	O	O	O	O	O	O
3. ...does a thorough job	O	O	O	O	O	O	O
4. ... remains calm in tense situations	O	O	O	O	O	O	O
5. ...has an active imagination	O	O	O	O	O	O	O
6. ...is outgoing, sociable	O	O	O	O	O	O	O
7. ...is sometimes rude to others	O	O	O	O	O	O	O
8. ...tends to be lazy	O	O	O	O	O	O	O
9. ...gets nervous easily	O	O	O	O	O	O	O
10. ...values artistic, aesthetic experiences	O	O	O	O	O	O	O
11. ...is talkative	O	O	O	O	O	O	O
12. ...has a forgiving nature	O	O	O	O	O	O	O
13. ...does things efficiently	O	O	O	O	O	O	O
14. ...worries a lot	O	O	O	O	O	O	O
15. ...is original, comes up with new ideas	O	O	O	O	O	O	O

Your General Well-Being

Please use the 1 (never or very rarely true) to 5 (very often or always true) scale provided to indicate how true the below statements are of you. Select the answer to the right of each statement which represents your own opinion of what is generally true for you.

	Never or very rarely true (1)	Rarely true (2)	Sometimes true (3)	Often true (4)	Very often or always true (5)
1. When I take a shower or a bath, I stay alert to the sensations of water on my body.	○	○	○	○	○
2. I'm good at finding words to describe my feelings.	○	○	○	○	○
3. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.	○	○	○	○	○
4. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.	○	○	○	○	○
5. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.	○	○	○	○	○

	Never or very rarely true (1)	Rarely true (2)	Sometimes true (3)	Often true (4)	Very often or always true (5)
6. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.	○	○	○	○	○
7. I have trouble thinking of the right words to express how I feel about things.	○	○	○	○	○
8. I do jobs or tasks automatically without being aware of what I'm doing.	○	○	○	○	○
9. I think some of my emotions are bad or inappropriate and I shouldn't feel them.	○	○	○	○	○
10. When I have distressing thoughts or images I am able just to notice them without reacting.	○	○	○	○	○

	Never or very rarely true (1)	Rarely true (2)	Sometimes true (3)	Often true (4)	Very often or always true (5)
11. I pay attention to sensations, such as the wind in my hair or sun on my face.	○	○	○	○	○
12. Even when I'm feeling terribly upset I can find a way to put it into words.	○	○	○	○	○
13. I find myself doing things without paying attention.	○	○	○	○	○
14. I tell myself I shouldn't be feeling the way I'm feeling.	○	○	○	○	○
15. When I have distressing thoughts or images I just notice them and let them go.	○	○	○	○	○

Your Background Details

The following information is required for statistical purposes only. All data is strictly confidential and won't be shared with any other parties. Please complete all of the sections below.

Which job sector do you work in? (e.g. education, finance, etc.)

Approximate level of your current role:

- ○ Non-managerial role
- ○ Mid-level manager or leader
- ○ Senior leader

How long have you worked in your current role (to the nearest year)?

Do you work full-time or part-time?

- ○ Full-time
- ○ Part-time

Approximately how many hours do you work in a typical working week?

Martial status:

- ○ Single
- ○ Married/Partner
- ○ Divorced/Separated
- ○ Widowed

Please select the number of children living in your household and/or for whom you have parental responsibility:

- ○ 0 children
- ○ 1 child
- ○ 2 children
- ○ 3 or more children

If you are a parent, please indicate the approximate ages of your children (tick all that apply):

- ☐ I am a parent to children under the age of 5
- ☐ I am a parent to children aged between 5 and 9
- ☐ I am a parent to children aged between 10 and 16
- ☐ I am a parent to children/young adults aged 17 and over

Information for Heart Rate Monitor

The following questions are common indicators for differences in participants' heart rates. The answers to the following questions will only be used to have an accurate reading for the heart rate monitor and for statistical purposes. Again, all data is strictly confidential and won't be shared with any other parties. Please complete all of the sections below as openly and accurately as possible.

Date of Birth:

Day	
Month	
Year	

Gender:

- ○ Male
- ○ Female

Height (please complete both boxes):

Feet

Inches

Weight (please only complete **one** box):

Kilograms

Stones, Pounds

Tobacco use (including cigarettes, e-cigarettes, vapes, etc.):

- Lifetime non-smoker
- Former smoker
- Current occasional smoker
- Current daily smoker

Typical **daily** intake of caffeine (including coffee, tea, fizzy drinks, etc.):

- None
- 1 to 2 drinks
- 3 to 4 drinks
- more than 5 drinks

Typical **daily** intake of alcohol:

- None
- 1 to 2 drinks
- 3 to 4 drinks
- more than 5 drinks

Exploring Employees' Mental and Physical Wellbeing

Day 1: One Hour Before Bed

This is the first of six surveys you will be asked to complete during this research period. The following table will help you keep track of each survey as you complete each one.

Day 1: One Hour Before Bed
Day 2: Upon Awakening
Day 2: After Work
Day 2: One Hour Before Bed
Day 3: Upon Awakening
Day 3: After Work

It is very important that you complete these surveys as soon as possible once you receive them. This survey should take about 5-10 minutes to complete.

Please click the arrow to continue.

Caffeine and Alcohol Intake

In order to have a clear recording of your heart rate, it is important to consider caffeine and alcohol intake. The following questions are used for statistical reasons only. Please answer the questions honestly and to the best of your abilities.

Please indicate if you had any form of caffeine (including coffee, tea, energy drinks, etc.) during the following time periods **today** by clicking 'Yes' or 'No.'

	Yes	No
Between 06:00 and 10:00	○	○
Between 10:00 and 14:00	○	○
Between 14:00 and 18:00	○	○
Between 18:00 and 22:00	○	○

Have you consumed alcohol (in any form including spirits, wine, beer, etc.) **today**?

- ○ Yes
- ○ No

Your Health and Well-Being

The following questions refer to the state of your health and well-being throughout **today**. Please indicate to what degree you were bothered by the following commonly occurring health issues.

	Not at all	A little bit	Somewhat	Quite a bit	Very much
1. Stomach or bowel problems	○	○	○	○	○
2. Back pain	○	○	○	○	○
3. Pain in your arms, legs, or joints	○	○	○	○	○
4. Headaches	○	○	○	○	○
5. Chest pains or shortness of breath	○	○	○	○	○
6. Dizziness	○	○	○	○	○
7. Feeling tired or having low energy	○	○	○	○	○

How have you felt this evening?

Below you will find a list of words that describe different feelings and emotions. Please select how much you have experienced each of these feelings/emotions over the course of this evening.

This evening, I have felt...

	Not at all	A little	Moderately	Quite a bit	Extremely
1. Full of energy	O	O	O	O	O
2. Contented	O	O	O	O	O
3. Depressed	O	O	O	O	O
4. Uneasy	O	O	O	O	O
5. Delighted	O	O	O	O	O
6. Calm	O	O	O	O	O
7. Sad	O	O	O	O	O
8. Anxious	O	O	O	O	O
9. Cheerful	O	O	O	O	O
10. Relaxed	O	O	O	O	O
11. Gloomy	O	O	O	O	O
12. Tense	O	O	O	O	O
13. Happy	O	O	O	O	O
14. Tranquil	O	O	O	O	O
15. Lacking energy	O	O	O	O	O
16. Afraid	O	O	O	O	O
17. Tired	O	O	O	O	O
18. Fatigued	O	O	O	O	O

Evening Work

We are interested in how people spend their time away from work. The following questions refer to any work you have done this evening, outside of your normal working hours.

Did you work at home this evening, outside of your normal working hours?

- O Yes
- O No

If 'Yes,' approximately how much time did you spend on work-related activities this evening?

Hours	
Minutes	

If you have worked on work-related tasks this evening...

	I have made no progress at all (0)	(1)	(2)	(3)	I have finished all of the unfinished tasks (4)
How much progress have you made?	O	O	O	O	O

Evening Thoughts

The following questions will ask you about your thoughts during your evening, starting when you finished work. Please think back over your time away from work, and click the answer that best fits your response to each question.

Thinking of your evening after work, how often did you experience the following?

	Not at all (1)	(2)	(3)	(4)	A great deal (5)
1. My thoughts kept returning to a stressful situation at work	O	O	O	O	O
2. I thought positively about my work performance	O	O	O	O	O
3. I worried about things I need to do at work	O	O	O	O	O
4. I worried about how I would deal with a work task or issue	O	O	O	O	O
5. I had constructive thoughts about a work project	O	O	O	O	O
6. I reflected on things that have gone well for me in my job	O	O	O	O	O
7. I became tense when I thought about work-related issues	O	O	O	O	O
8. I was annoyed when thinking about work-related issues	O	O	O	O	O
9. I was irritated by work issues	O	O	O	O	O
10. I became fatigued thinking about work-related issues	O	O	O	O	O
11. I was troubled by work-related issues	O	O	O	O	O

Exploring Employees' Mental and Physical Wellbeing

Day 2: Upon Awakening

This is the second of six surveys you will be asked to complete during this research period. The following table will help you keep track of each survey as you complete each one.

Day 1: One Hour Before Bed
Day 2: Upon Awakening
Day 2: After Work
Day 2: One Hour Before Bed
Day 3: Upon Awakening
Day 3: After Work

It is very important that you complete these surveys as soon as possible once you receive them. This survey should take about 1-3 minutes to complete.

Last Night's Sleep

The following questions ask about your thoughts on how well you've slept.

How was your sleep last night?

Very poor	Rather poor	Neither poor nor good	Rather good	Very good
O	O	O	O	O

How calm was your sleep last night?

Very restless	Rather restless	Neither restless nor calm	Rather calm	Very calm
O	O	O	O	O

How easy did you find it to fall asleep?

Very difficult	Rather difficult	Neither difficult nor easy	Rather easy	Very easy
O	O	O	O	O

Did you wake up prematurely?

Yes, I woke up much too early	Yes, I woke up somewhat too early	No, I did not wake prematurely
O	O	O

How easy was it for you to wake up?

Very difficult	Rather difficult	Neither difficult nor easy	Rather easy	Very easy
O	O	O	O	O

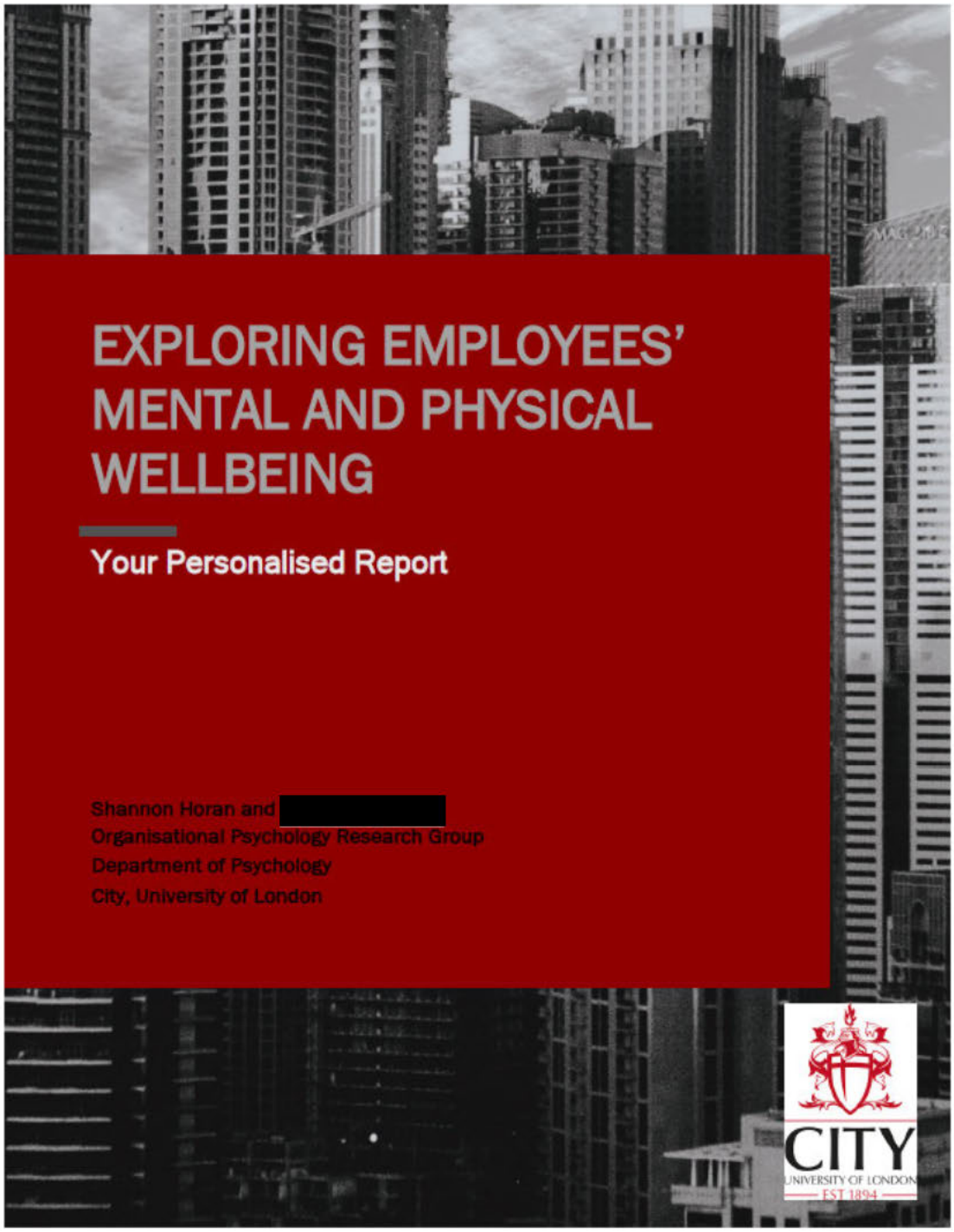
How rested do you feel?

Not rested at all	Somewhat unrested	Completely rested
O	O	O

Did you get enough sleep?

No, definitely too little	No, much too little	No, somewhat too little	Yes, almost enough	Yes, definitely enough
O	O	O	O	O

Personalised Report for Participants


EXPLORING EMPLOYEES' MENTAL AND PHYSICAL WELLBEING
Your Personalised Report
Shannon Horan and [redacted]
Organisational Psychology Research Group
Department of Psychology
City, University of London
CITY
UNIVERSITY OF LONDON
EST 1894

Exploring Employees' Mental and Physical Wellbeing

Thank you

We would like to start this report with a thank you. We are very grateful for your participation and would not be able to gather this important data without you.

The knowledge that we are able to gain from this project is valuable, and your time and effort are much appreciated.

In this report:

This Research Project

Background: In the United Kingdom, workplace stress continues to be at the forefront of concerns for employees' mental and physical health. Recent survey reports have found that over half of UK employees think that their work has detrimental effects on their wellbeing. Research on employee stress has concluded that work-related stress is often unavoidable; employees put effort into their work which causes varying levels of stress in their working lives. This in itself is not necessarily harmful for employees. However, if work-related stress carries into the periods away from work (i.e. evening, weekend, and vacation periods), this is where wellbeing begins to suffer. There is increasing interest in how employees recover from stress during breaks from work and how this has an impact on their mental and physical wellbeing.

Our aims for this project: This project was designed to explore employees' mental wellbeing (using online surveys) and physical wellbeing (using a heart rate monitor) during the work day, evening, and sleep.

Mental and physical wellbeing is very closely linked, with each having an influence on the other. The main aim of this research is to explore that link in a working population. More specifically, this research aims to closely explore how employees' interact with their environments both within the workplace and outside of the workplace.

First, the time during the workday was evaluated to see how employees evaluate and cope with daily work demands and pressures. We then focused on the evening after work, to see if this period serves as an adequate time for employees to recover from work-related demands. Lastly, we wanted to explore how sleep interacted with employees' workdays. We aim to further understanding of the impact of the working day on sleep quality.

What were we measuring? While you wore the heart rate monitor and filled in the online surveys, there were a number of different things we were investigating.

In the online surveys, we looked at different measures and ways employees experience workplace stress. For example, we looked at how employees view their daily work demands and how they personally think and respond. We also explored the degree to which work day experiences continued to have an impact in the evening and during sleep.

With the heart rate monitor data, we were able to calculate employees' scores of heart rate variability (which is discussed below). This measure allows us explore both mental and physical reactions during different parts of the day.

3

Heart Rate Variability (HRV)

What is Heart Rate Variability? Contrary to popular belief, the heart does not actually beat like a metronome. There are slight changes in our heartbeat from beat to beat, depending on activity and emotions. We are able to measure those changes between each heartbeat; this measurement is known as Heart Rate Variability (HRV).

Why look at HRV and not heart rate? Heart rate is the measurement of average heartbeats per minute; whereas HRV measures the changes between each individual heartbeat. This is an important measure because the changes between each heart beat can tell us a lot about individual's mental and physical health and wellbeing. Specifically, this measure can provide information on how quickly people are able to recover from daily challenges and life's demands.

What do you look for with HRV scores? Higher HRV scores are often seen as a good thing, because higher HRV indicates a healthy degree of flexibility to the environment around you, and in response to the different demands you might face across a typical day. Lower HRV over an extended period of time can indicate that we are not getting enough recovery from the pressures and demands of daily life.

Is low HRV bad? Temporary low scores of HRV are not necessarily bad. Reduced HRV is an important bodily function that allows you to physically prepare, and motivates you in social interactions and in stressful situations. The rush that stress brings can be utilized to deal effectively with challenging situations; your body is simply trying to adjust to the situation you are in. Stress is typically seen as a problem when it goes on too long without respite, and when people do not have opportunities to recover from the demands and pressures that are being placed on them.

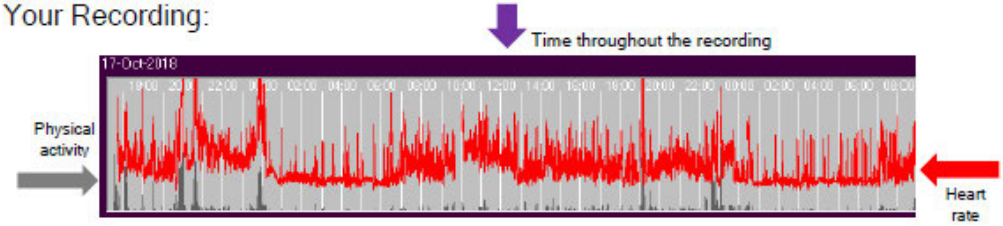
What will my HRV scores tell me? It is important to highlight that HRV scores are unique to each individual and should not be compared to others around you. There are many factors that contribute to HRV scores including age, gender, genetics, height/weight, emotions, physical activity, food/drink, external influences, etc. A personal benchmark score will be calculated for you, which will represent you HRV score for the full recording period. Using that score, you'll be able to compare it to the scores at different time periods throughout your working day. Here you will be able to see where your HRV score might increase or decrease throughout the day.

Should I be concerned about my results? No, it is not our intention to cause any concern. It is important to remember that this is research equipment, not medical equipment. Here there are no 'good' and 'bad' scores, we are simply comparing your different time points to your unique benchmark score. We hope this is insightful and gives you the opportunity to reflect over your typical working and leisure time habits.

Please keep in mind: We want to emphasize that HRV is a good indicator of health and wellbeing, but it is *only one* indicator. There are many other aspects that make up your overall health and wellbeing, so it is important to not rely only on this one measure. We hope that the information in this report will be useful for reflecting on your own experience of your day-to-day working life. We have also provided some simple tips and recommendations for enhancing your daily wellbeing and leisure experiences.

4

Your Recording:



Your data

What is 'Your Recording'? Above is a copy of the data collected from your heart rate monitor. Both your heart rate and physical activity were recorded while you wore the band. (If there are any sections without any data, this represents times in which you removed the monitor or the signal was lost.)

What does this show me? This shows you the changes in your heart rate throughout the research period. Your heart rate will naturally increase as you increase your physical activity, but it may also increase when you experience stress. You might want to reflect back on the research period and look at the different periods of your day. Do you see changes in your heart rate when you are at work compared to when you are at home or asleep? Can you remember certain parts of that day where you were very active or were stressed? Does the recording reflect that?

Your Analysis

To the right is your overall HRV score for the time period above and represents your unique benchmark score.

In the table below, you will find your HRV scores at the different time periods while you wore the monitor. Green represents times when you were above your benchmark, orange is when you were below your benchmark, and the red indicates when your HRV was at its lowest. *Remember, higher scores of HRV are better than lower scores.*

Your unique benchmark score:

88.34

Time Period	Evening (Day 1)	Sleep (Day 1)	Workday (Day 2)	Evening (Day 2)	Sleep (Day 2)
HRV Score	69.57	101.15	87.34	86.19	97.50

What can I take away from this analysis? Here, you will be able to see when your HRV is at the lowest, and whether you are able to recover from that low score. As mentioned before, lower HRV scores are an indication of your body physically responding to your environment, so this is not necessarily a bad thing. What could be an indication of poor recovery, is if your scores remain low throughout the different time points in your day. If this is the case, on the next two pages we have some recommendations to help improve health and wellbeing at the different times of your working day.

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Recommendations

Research has found that stress in itself is not necessarily a bad thing, but it is how we react, interact, and relate to the stresses in our lives that can either be helpful or harmful. In this recommendations section, we will be giving you some tips on how to improve your health and wellbeing at the different points of your working day.

During the working day: During the working day is typically when employees experience the most stress, which is represented in lower/lowest HRV scores during this time period. As stated previously, this could simply be the body preparing employees for their socially, mentally, and/or physically demanding working environment. The following are ways to improve health and wellbeing during the working day:

Building resilience and adaptability can help improve the way in which you interact with the stress in your working life. We would recommend mindfulness as a means to enhance employees' relationship with workplace stress. If you are interested in learning more about mindfulness, we recommend the following resources:

- The UK's Mental Health Foundation provides a lot of useful information about mindfulness skills and courses, including an on-line course if you want to practice in your own time: https://www.mentalhealth.org.uk/our-work/mindfulness
- One of the most respected books written on mindfulness is "Finding Peace in a Frantic World", by Prof Mark Williams and Dr Danny Penman. The book includes free access to some excellent recordings of mindfulness exercises: http://franticworld.com/
- Finally the HeadSpace phone app is highly regarded, and can help you build mindfulness practices into your everyday life: https://www.headspace.com/

Additionally, sitting throughout the day has been shown to have detrimental effects on employees' health and wellbeing during the working day. Go back to the 'Your Recording' section on the previous page and have a look at your physical activity throughout the research period. Building in more physical activity to your typical working routine can improve both mental and physical wellbeing. Some ways to do this can include:

- Being more active in your commute. This could be in the form of walking, running, or cycling into work. Or simply walking up the escalators in the tube/train station rather than standing, or getting off the bus/tube a stop early and walking the remaining distance.
- Being more active in your working day. This could involve setting alarms/reminders to get up, stretch, and walk away from your desk for breaks throughout the day, using the stairs rather than lifts in your building, and going outside during your lunchtime.

Recovering in the evening: Research has found that even during periods where high effort is expended at work, this was not detrimental to employees' health and wellbeing, as long as they had the opportunity to recover during non-working periods. An indication of good health is when an employee is able to recover completely from one day's workload before the next day begins. The following recommendations are ways to improve recovery in the evening after work.

Psychological experiences that can enhance recovery:

- Psychological detachment is a term used to describe employees' sense of being away from their work. Being detached implies being more than just physically detached (i.e. stopping work in the evening and not checking/answering emails away from your desk) but also removing yourself mentally from work (i.e. stop thinking/worrying/ruminating about work). If detaching mentally from work is something you struggle with, again we recommend mindfulness as a way to 'disentangle' oneself from these unhelpful thought patterns.
- Research has found that humour can be beneficial in relieving stress, and improving recovery and sleep quality. Laughing and being engaged in humour have both mental and physical benefits for your health and wellbeing. Or course, humour is subjective, so find something that makes *you* laugh and practice being in that humour state during the evening after work.

Activities that can help improve recovery experiences:

- Relaxation activities such as yoga, meditation, prayer, listening to music, taking a walk outside, and taking a hot bath, are all activities that enhance relaxation and have been found to remove employees from demanding and effortful activities that are usually associated with their workplace. Enhancing relaxation has been found to increase recovery because it reduces mental and physical activation.
- Social activities such as speaking to others on the phone or in person, going out to dinner, or going to a party involve two aspects that can improve recovery. First, this allows employees to engage with social support, which has been found to reduce the negative influence of job stress. Secondly, social interactions with friends or family might use different resources than work-related tasks, which allows recovery to take place. However, it is important to note that if social interactions involve talking frequently about each other's work, this can have detrimental impact on recovery. Additionally, certain personalities will benefit more from social interaction than others (i.e. extraverts vs introverts).
- Physical activities including exercise, training, and sports are important for improving and maintaining mental and physical health. The time that is set aside for exercise has been found to provide employees the opportunity to enhance mood and recovery. Furthermore, the achievement felt after completing physical activity outside of the workplace can be linked to enhancing positive mood and wellbeing.
- Creative activities, including hobbies, have been found to have important restorative properties. They allow employees to enhance their skills, and feel rewarded and fulfilled by mastering something. Previous research has found that employees that reported higher levels of creative activity in the evening had better recovery and had a positive effect on the next working day.

Improving Sleep: Sleep is a very important aspect of mental and physical recovery in itself, but has also been shown to improve functioning that was lost from work-related stress, as well as maintain performance for the following day. Adults need on average 7 to 9 hours of sleep a night; too much or too little sleep can have negative effects on health and wellbeing. The quality of one's sleep is also very important for recovering during sleep. The following are recommendations to help improve sleep:

- Set a consistent routine in the evening which prepares you for sleep, which also includes going to sleep and waking up around the same time every day. This has been found to help people fall asleep faster and improve the quality of their sleep.
- Paying attention to food and drinks can improve sleep. It is best not to go to sleep hungry or too full, because discomfort might keep you awake. Caffeine and nicotine both take hours to wear off, so it is recommended to reduce intake, especially in the evening. Although alcohol may make people feel sleepy, it has been found to disrupt sleep, so again something to monitor before bedtime.
- Research has found that the 'blue light' commonly found in smartphones and televisions can cause alertness and interrupt normal sleeping patterns. It is suggested to avoid exposure to blue light 30 to 60 minutes prior to sleep.
- Researchers have found that unfinished work tasks can play on our minds and interfere with good sleep. If you have some unfinished tasks at the end of the work day, write down a brief note of when and how you will you finish them. This simple task has been shown to help people clear their minds of the tasks that that they still need to complete.

From the team

We hope you found this report insightful and you might be able to implement one or a few of these recommendations into your own life. Again, thank you for your participation in this research project, we are very grateful.

We are currently recruiting more participants for this project, so if you know anyone that might be interested in this research, please have them contact Shannon Horan, [redacted] to see how they can also get involved.

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