Sport coaches, mindfulness, and daily life:
The role of mindfulness in promoting wellbeing.

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Abstract

Mindfulness is an inherent human capacity: a state of consciousness which everyone has the ability to experience, and which is consistently related to positive psychological and physical outcomes. Sport coaching is a challenging occupation, known to be demanding and, at times, stressful. This thesis explores different ways in which mindfulness assists sport coaches to maintain wellbeing, in the face of the demands and challenges of their coaching work. The thesis comprises three empirical studies, each investigating relationships between coaches' mindfulness levels and wellbeing related outcomes. Each uses a different research design and method, providing unique insight on the relationship between coach mindfulness and wellbeing. The first study, using cross-sectional data collected from 143 New Zealand-based coaches working at a range of coaching levels, tests for relationships between mindfulness, and recovery from work demands. Different conceptualisations of work-related rumination are included in the model as mediator variables. The second study builds on the first, but utilises an intensive longitudinal design. This study draws on daily data collected from a sample of 46 New Zealand based coaches, over a period of 28 consecutive days. Multi-level modelling is used to test for relationships between fluctuations in individual coaches' daily mindfulness levels, and subsequent changes in work related rumination and in work-recovery related outcomes. The third and final study also assesses the daily data, this time analysing brief qualitative diary entries relating to both stressful and positive daily events. Multi-level logistic regression is used to test for relationships between daily mindfulness levels, and the content of the daily diary entries. Results from the three studies show mindfulness to be influential both in terms of the stress that coaches experience, and in their ability to recover from the daily demands of their work. These relationships hold at both the between and within person level: individual coaches' general mindfulness levels relate to their wellbeing, as do day to day

variations in mindfulness. Findings from the three studies have important practical implications. Mindfulness can be developed and enhanced through training and practice. For coaches who are challenged by the demands and pressures of their job, or for the organisations who employ or support those coaches, focusing on building mindfulness could be a powerful strategy for improving and maintaining wellbeing.

Acknowledgements

I have often likened my PhD journey to an adventure race: at the outset, daunting, challenging, but for some reason exciting. In the thick of it, the question 'why?' hits me over and over and it seems the end will never, ever come. At moments, quitting feels like the most wonderful possibility, but actually quitting is an impossibility. And toward the end, immense relief but also the knowledge there will, eventually, be immense satisfaction.

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Chapter 1: Thesis Introduction

Sport in New Zealand

Sport is an important part of New Zealand's culture (Grant, 1992), perhaps even integral to the national identity (Angus & Associates, 2017). New Zealanders celebrate their sporting teams and heroes and take pride in international sporting victories. Athletic success generates a feel-good factor amongst the population (Wicker, Prinz, & von Hanau, 2012). Top athletes act as role models and project an image, internationally, of national success (Frey, 2007). On home turf, many families spend their Saturday mornings at the sports field taking part in or watching sporting competition, and sport plays an important role in building and maintaining communities (Keegan, Harwood, Spray, & Lavallee, 2009). "The Value of Sport" report (Sport NZ 2018) says "Put simply, sport and active recreation creates happier, healthier people, better connected communities and a stronger New Zealand" (p. 1).

Benefits of sport participation are varied and significant. Children and young adults learn important lessons about teamwork, leadership and fair play (BIM 2017) while amongst adults sport participation is related to increased social interaction, improved self-esteem, and fewer depressive symptoms (Eime, Young, Harvey, Charity, & Payne, 2013). Sport participation has also been linked to increased work productivity (Dalziel, 2011). Sport provides opportunities for learning and skill development for people at all stages of life (Keegan et al., 2009). Additionally, there are numerous physical health benefits associated with sport. Participation in physical activity is known to reduce the risk of obesity, Type 2 diabetes, hypertension, high blood glucose levels, coronary heart disease, and early mortality, and may also have beneficial impact on rates of breast cancer, colon cancer, osteoporosis, and stroke (Bull & Bauman, 2011; Oja et al., 2015). The cost of physical inactivity, on the other hand, is

high. Conservatively estimated, physical inactivity cost New Zealand's healthcare system over $200m in 2013 (BIM 2017), a figure which could be reduced if widespread participation in sport were increased.

Given the positive impact of sport on individuals, communities, and society as a whole, sport participation is desirable and this is reflected in the significant amount of government funding directed toward sport (Dalziel, 2011). The New Zealand government invests approximately $85 million per annum in sport and recreation (BIM 2017), justified by knowledge that sport enriches the lives of New Zealanders, as well as bringing about health, social, economic and cultural benefits to individuals and communities alike (BIM 2017). A portion of this funding supports an infrastructure which includes school sports, sports clubs, regional sports associations, and national sporting organisations.

At the heart of sporting infrastructure are coaches, without whom organised sport would not be possible. Coaching is a unique profession, in that its workforce comprises a range of levels and occurs in a variety of context and settings (Duffy et al., 2011). The term 'coach' can encompass anyone from volunteer community coaches through to those who work full time at the high-performance level. To this end the International Council for Coaching Excellence (ICCE), a non-profit organisation aimed at leading and developing sport coaching globally, has positioned coaching as a 'blended profession' (Duffy et al., 2011), reflecting its diverse makeup.

Regardless of where they sit within the profession, all coaches are in a position to make an important to contribution to sport and to wider society. Coaches are integral not just to the development of athletes and sports teams, but also to the functioning of clubs and other sports entities. For example, the role of a coach can involve acting as an administrator and a recruiter, as a fund-raiser and as an accountant (Taylor, 1992), on top of the task of preparing athletes

for competition. Coaches play a central role in encouraging and maintaining participation in sport (Fletcher & Scott, 2010) and in doing so contribute to the positive social and health outcomes that sport brings. Furthermore, coaches become important figures in the lives of many sports participants. They often act as teachers and mentors to younger athletes (Giges, Petitpas, & Vernacchia, 2004), teaching social skills and important concepts such as sportsmanship and fair play (Kelly, Thelwell, Barker, & Harwood, 2018). The goals of coaches may vary, from teaching basic skills and building enjoyment at the junior level, to promoting and ensuring performance at the elite level (Kelly et al., 2018), but coaches are all alike in that the core purpose of their role is to help, develop, and meet the needs of others (i.e., athletes and sportspeople) (Chroni, Diakaki, Perkos, Hassandra, & Schoen, 2013). Coaches, therefore, have an important role not just within sporting organisations but also the wider community. They have the potential to influence people from different backgrounds and at different stages in their lives, in terms of their participation in and experiences of organised sport.

Coaches and job demands

Sport coaching is known to be a demanding and, for some, stressful, job (Fletcher & Scott, 2010). While reasons for these demands and associated feelings of stress are likely to vary across individuals as well as coaching settings, the coaching literature has identified some common challenges of the role. A significant issue for many coaches is the multifaceted nature of their job which may include tasks and responsibilities for which they are not prepared (Capel, Sisley, & Desertrain, 1987; Duffy et al., 2011). For example, new coaches might know a lot about their sport, but know less about how to perform aspects of their role which are not directly sport-related but are important to team or athlete success, such as structuring and running training sessions, or cultivating a positive team environment. This is especially true for the large number of coaches who enter the profession with little formal training, having arrived in coaching via a path as an athlete or as a volunteer administrator (Duffy et al., 2011). Their

coaching competencies may have been developed informally, through their own sporting background as well as their experience as a coach (Mallett & Rynne, 2015), and it is possible that some coaches feel ill prepared to perform the wide range of tasks their role entails. For example, a coach's job can involve designing and implementing the physical, tactical and technical training programme, leading training sessions, making selection decisions, travelling with and managing the squad on game days (Potrac, Mallett, Greenough, & Nelson, 2017), as well as completing administrative and organisational tasks. Coaches may find that, due to gaps between the competencies they have and the skill set required for their role, they are not equipped to deal with the challenges they face (Busser & Carruthers, 2010; Wiersma & Sherman, 2005), leading to feelings of stress. Additionally, many coaches experience feelings of role overload, either because of the variety or volume of tasks associated with their coaching role (Taylor, 1992), or because their coaching work is part time and they are juggling other employment (Capel, Sisley, & Desertrain, 1987). For example, the coaching workforce in New Zealand is made up of around 300,000 coaches, 264,000 of whom are volunteer coaches. Of the paid coaches, approximately 10% of the coaches are employed on a full-time basis and for the remaining 90% coaching is a part time form of employment (Community Sport Coaching Plan 2016 – 2020).

Another demand often experienced by coaches is pressure and expectation that those they coach will perform well, and deliver good results. This is most obvious at the competitive level, where coaches may perceive they are being judged and evaluated by peers, colleagues, employers and sponsors, and the general public, at every competition (Giges et al., 2004). Ironically, competitive success can increase rather than ease this pressure. Once an athlete or team starts winning there is pressure to keep winning, and to stay on top for as long as possible, and the coach often feels or is held responsible for making this happen (Frey, 2007; Giges et al., 2004). For high performance coaches, who typically hold short term roles and unpredictable

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contracts, the consequences of competitive wins or losses are especially significant. They can be held completely responsible for competition results, even when losses are due to circumstances beyond their control (Mallett & Côté, 2006), and their continued employment is often dependent on athletes' and players' results (Purdy & Potrac, 2016). Even in sporting grades where competition is not so important, such as child and youth sport, coaches must deal with performance expectations from parents. Parents may have competitive goals for their children which are at odds with the coach's developmental goals, and this can be a source of conflict and stress (Knight & Harwood, 2009). The need to deliver performance results is a pressure felt by many coaches, regardless of the age, ability, or competitive level of those they coach.

Demands such as task overload and performance pressure usually stem from organisational and environmental factors, but coaches also experience demands because of personal factors. For example, the pressure to perform and to create a good environment for athletes and players may come not from external sources but from the coaches themselves (Durand-Bush, Collins, & McNeill, 2012). Further, many coaches care deeply about their sport and the people in it, and describe their work as forming a large part of their identity. They report high levels of emotional investment (McNeill, Durand-Bush, & Lemyre, 2017), more so than might be usual in other occupations (Potrac et al., 2017). This can be the case whether the coach is a full time professional, or a volunteer who gives up their own leisure time to coach (e.g., Potrac et al., 2017). For coaches who are highly invested in their coaching work, negative coaching related events such as a period of poor results or underperformance can be particularly upsetting on a personal level (Purdy & Potrac, 2016). In addition, this high degree of identity as a coach and perceived importance of coaching work means that coaching related activities can easily spill over into other areas of life (Potrac et al., 2017). Coaches may feel conflicted because they have feelings of responsibility for their athletes, which can encroach on family

time and commitments (Bruening & Dixon, 2007). Coaching has been described as a lifestyle, an around-the-clock occupation rather than a job (Frey, 2007). For coaches who feel this way, it can be very difficult to separate work from life outside or work and to mentally switch off from coaching related thoughts (McNeill et al., 2017). Nor do they always want to; Giges et al. (2004) describe this as the paradox of passion, that the work that the coach cares about the most could be the thing that wears them down the most.

Coach stress and burnout

As already noted, for some coaches the demands of their role can result in feelings of stress. The stress literature helps to explain why this is the case. According to the transactional theory of stress, psychological stress is the result of an appraisal process (Lazarus & Folkman, 1984). When confronted with a potentially stressful situation, an individual weighs up the scale of the threat they are facing, as well as the coping options and resources available to them to meet the threat (Lazarus, 2006). If the potential coping resources or options are insufficient to counter the threat, feelings of stress will result. Coaches typically face a large volume and variety of demands, many of which could be stressors. Additionally, many carry out their roles with limited resources or social support (Malinauskas, Malinauskiene, & Dumciene, 2010). Thus, it is likely that demands often outweigh resources, explaining the prevalence of stress amongst coaches.

Unmet demands can lead to feelings and symptoms of stress, which in turn are a precursor to burnout. The development of stress-related burnout amongst coaches has been a focus of coaching research in recent years (e.g., Bentzen, Lemyre, & Kenttä, 2016a; Hjälm, Kenttä, Hassménan, & Gustafsson, 2007; Kelley, Eklund, & Ritter-Taylor, 1999); a recent scoping review included 45 peer-reviewed, published articles relating to coach burnout (Olusoga, Bentzen & Kentta, 2019). Burnout has been identified as a problem at all levels of

coaching, and as a major factor in coach retention (O'Connor & Bennie, 2006). Burnout is a psychological state in which one experiences feelings of emotional exhaustion, cynicism, and a reduced sense of accomplishment (Maslach, Jackson, Leiter, Schaufeli, & Schwab, 1986). Coach burnout is often predicted by chronic stress (Kelley, 1994), and those who are more committed to and invested in their coaching role may experience stress more often, and therefore be more susceptible to burnout (Raedeke, Granzyk, & Warren, 2000). Coaches who experience burnout are likely to feel emotionally depleted, and some may experience a desire to distance themselves or withdraw from the coach-athlete relationship (Kelley, 1994; Price & Weiss, 2000). This means that burnout can affect not just the coach but also those around them. Coach attitude can have an impact on athletes' and players' enjoyment of and motivation to continue in sport (Smith, Smoll, & Barnett, 1995; Wiersma & Sherman, 2005), and negative coach/athlete interactions have been found to hinder athlete performance (Davis, Appleby, Davis, Wetherell, & Gustafsson, 2018). Burnout, therefore, directly impacts affected coaches, but can also be detrimental to the athletes and sportspeople with whom they interact.

Coach wellbeing

While there is a good deal of knowledge about the demands faced by coaches, as well as the causes and consequences of coach stress and burnout, far less attention has been paid to promotion of coach wellbeing (Norris, Didymus, & Kaiseler, 2017). This might be a natural reflection of competitive sporting culture, where often there is a focus on athletes' development and competitive performance, perhaps at the expense of the health and wellbeing of coaches and other employees. Many coaches are willing to sacrifice their own health, both physical and psychological, in order that athlete and player performance does not suffer (Bruening & Dixon, 2007). Coaches often have high expectations about their own performance, but do not have the same high expectations about their wellbeing; in some cases, more importance is placed on the need to win (or perform well) than the need to look after oneself (Durand-Bush et al., 2012).

Additionally, athletes have been found to respond positively to servant leader characteristics in coaches (Rieke, Hammermeister, & Chase, 2008), where the needs of the followers come first, potentially creating expectations or even incentives for an element of self-sacrifice amongst coaches.

As an example of institutionalised self-sacrifice, the Sport New Zealand Community Sport Coaching Plan 2016 - 2020 reflects the attitude that athletes' and players' needs are paramount, stating "coaching should focus first and foremost on the needs of the participant or athlete being coached." (p 6). The plan goes on to say that good coaching is fundamentally about participants receiving the support they need to enjoy their sport and fulfil their sporting potential, and that for this to occur capable coaches are needed at all levels of the sporting system. The second point is important. To be effective, coaches need to be capable. It could be argued that to be at their best for their athletes and sporting participants, coaches need to be at their best themselves.

An absence of stress and burnout is one aspect of coach wellbeing, but not the full picture. Coach wellbeing has not been clearly defined in the literature, with multiple, broad definitions being used (Norris et al, 2017), drawing from more general wellbeing literature. In the wider (i.e., not coach specific) literature, definitions of wellbeing relate to the ability to function effectively. For example, an individual may be described as experiencing wellbeing when they are feeling good and functioning well (Aked at al., 2009); when they are in a state of optimal functioning (Deci & Ryan, 2001); and when they experience positive mood, or at least an absence of negative mood (Diener et al, 1999). It can be assumed these definitions are relevant to the coaching setting. Just as with the experience of stress, the consequences of wellbeing stretch beyond the coach themselves. Coaches who experience wellbeing are more likely to act positively toward athletes, helping build positive coach/athlete relationships. Additionally, those coaches are more likely to use autonomy-supporting coaching behaviours,

creating a favourable training environment for athletes (Alcaraz, Torregrosa, & Viladrich, 2015). Contrary to the idea of self-sacrifice, coaches might better serve others by first ensuring their own wellbeing. Promotion of coach wellbeing is not, however, discussed in the NZ Coaching Plan. Further, there is very little literature regarding how coach wellbeing might best be supported (Norris et al., 2017). Coach wellbeing is clearly important but has received relatively little attention in either academic or applied settings.

It should be noted, at this point, that while coaching is thought to be a demanding occupation and while stress is prevalent amongst coaches and burnout is a recognised issue, not all coaches are on a path to burnout. Some coaches climb to the very top of their profession while maintaining good psychological and physical health. They may have been fortunate to work in more favourable conditions than other coaches, but it is also likely that personal factors help to explain the difference in stress perceptions, and wellbeing outcomes, across coaches (Fletcher & Scott, 2010; Taylor, 1992). Mindfulness is one such factor which may help explain individual differences in coach stress and wellbeing.

Mindfulness

There is a large and ever-growing volume of literature on mindfulness, accompanied by discussion and debate about what the term 'mindfulness' actually means and how it should be conceptualised and measured. Some argue that 'mindfulness' has become an umbrella term, with varying meanings given to the same word (Fischer, Stanszus, Geiger, Grossman, & Schrader, 2017; Khoury et al., 2017); this may be reflected by mindfulness being referred to in the literature as a theoretical construct, as a psychological process, and as a practice (Germer, 2004). Perhaps this plurality of meaning should not be surprising. Even the Buddhist term 'sati,' upon which the modern concept of mindfulness is based, has a range of differing interpretations (Gethin, 2011). One thing that researchers agree on, however, is that

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mindfulness has to do with attention. Jon Kabat-Zinn, often referred to as the founder of modern mindfulness science (Black, 2011), explains mindfulness as "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 2009, p. 4).

In developing the Mindfulness Based Stress Reduction (MBSR) programme, in 1979, Kabat-Zinn integrated contemporary clinical psychology practice with Buddhist mindfulness meditation. The intervention, originally intended for sufferers of chronic pain, proved to be effective for a range of mental and physical disorders (Chiesa & Serretti, 2009). Since then, a number of other mindfulness based therapeutic programmes have been developed, alongside a body of research attempting to explain how and why mindfulness works, and various scales aimed at measuring mindfulness. The present thesis utilises Brown and Ryan's definition, where mindfulness is a state of consciousness involving a "receptive attention to and awareness of present events and experience." (Brown & Ryan, 2003; p 212). This outwardly simple definition of mindfulness captures or implies a range of important characteristics. 'Awareness' refers to the conscious registering of events and experiences which occur around or within an individual, but which are essentially in the background, while 'attention' places focus on those events and experiences and pulls them to the foreground of consciousness, so that they are noticed (Brown & Ryan, 2003; 2007). Receptivity implies openness, in that objects of consciousness are seen as they really are in any given moment, rather than interpreted through a lens of bias, judgment, or preconceived ideas. Through receptivity, mindfulness promotes non-discriminatory awareness and an empirical rather than subjective stance toward reality (Brown & Ryan, 2003). The more mindful an individual, the better able they are to observe the world as it really is, rather than how they think it might be.

Much of the existing mindfulness research is based on interventions designed to develop and strengthen mindfulness in individuals, such as MBSR (Kabat-Zinn, 1982) and

Mindfulness Based Cognitive Therapy (Segal, Williams & Teasdale, 2013). These interventions are typically, but not exclusively, targeted at clinical populations and have been found effective in improving a range of stress-related outcomes (Gu, Strauss, Bond & Cavanagh, 2015). In recent years mindfulness-based interventions have been developed for sports settings, aimed at promoting athlete wellbeing as well as performance enhancement (Gardner & Moore, 2017). Additionally, two programmes have been developed specifically for sport coaches and have been found to be effective in terms of stress reduction (Longshore & Sachs, 2015; Lundqvist et al., 2018). Mindfulness based interventions, aimed at developing mindfulness in participants so they can benefit from related positive outcomes, have been found effective in a range of populations and settings (Chiesa & Serretti, 2009).

Mindfulness does not, however, have to be learned to be experienced. According to Brown and Ryan (2003), mindfulness is a state of consciousness which everyone has the capacity to experience, regardless of training or practice. Some people, for reasons perhaps related to genetic predisposition or to environmental circumstances, are naturally mindful more frequently and consistently than others (Davidson, 2010). The tendency toward mindfulness therefore varies between people. In addition, the psychological state of mindfulness can fluctuate within individuals (Hülsheger, Alberts, Feinholdt, & Lang, 2013). For example, someone who has a naturally high level of mindfulness will still have moments or days when they are less aware of the present moment, and when they end up completing tasks on autopilot (Hülsheger et al., 2013; Siegel, 2009). Mindfulness can therefore be considered trait-like (referred to in this thesis as dispositional mindfulness) and as a state of consciousness which can vary somewhat from day-to-day within individuals (referred to in the thesis as state mindfulness).

Dispositional mindfulness has been related to a number of positive psychological and physical outcomes, including quality of sleep, healthy eating practices, general physical health

(Murphy, Mermelstein, Edwards, & Gidycz, 2012), and general life satisfaction (Brown & Ryan, 2003). As well as this, negative relationships have been found between mindfulness and depression (Cash & Whittingham, 2010), as well as a range of general psychological symptoms (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Scholars and practitioners are understandably interested in understanding why and how mindfulness predicts physical and psychological health. One proposed mechanism is a process variously referred to as de-centering (Brown, Ryan, & Creswell, 2007b), decoupling (Brown & Ryan, 2003; Hülsheger, Feinholdt, & Nübold, 2015) and re-perceiving (Shapiro, Carlson, Astin, & Freedman, 2006). These terms refer to a shift in perspective (Pearson, Brown, Bravo, & Witkiewitz, 2015), where an individual steps back from their thoughts, feelings and emotions, and acknowledges these as cognitive processes rather than reality (Segal, Williams, & Teasdale, 2013). Through decentering, an individual can view both internal and external experiences more objectively, simply observing and registering what is taking place (Shapiro et al., 2006), rather than seeing through the lens of personal biases (Carmody, Baer, Lykins, & Olendzki, 2009; Good et al., 2016). This shift in perspective is thought to disrupt automatic or habitual behavioural responses, and to instead allow for more intentional and self-regulated action (Shapiro et al., 2006). Additionally, decentering may lessen the tendency to evaluate thoughts and emotions in a self-referential way and is for this reason thought to contribute to decreased rumination (Bernstein et al., 2015; Glomb, Duffy, Bono, & Yang, 2011). Improved self-regulation, and decreased ruminative thought patterns, are both potential contributors to the positive health impacts of mindfulness (Gu, Strauss, Bond, & Cavanagh, 2015; Shapiro et al., 2006).

Dispositional mindfulness may also be related to positive psychological and physical health outcomes because of its influence in the stress appraisal process. An individual with a mindful, decentred perspective may be better able to make objective and therefore accurate assessments of the threat of potential stressors (primary appraisal) (Weinstein, Brown, & Ryan,

2009), which could in turn increase their ability to assess available coping resources and options (secondary appraisal) (Garland, 2007). By impacting both primary and secondary appraisal, mindfulness may reduce the likelihood of threats being perceived as stressful. If, however, an event or experience is threatening enough to be cause stressful, the shift in mindset that constitutes decentering is thought to allow for alternative appraisals of potentially stressful events and in particular for positive reappraisal to occur (Garland, Gaylord, & Park, 2009). Positive reappraisal is a process through which initially stressful events are reframed as meaningful, or even as opportunities for personal growth (Lazarus & Folkman, 1984). Overall, it is possible that people who are higher in mindfulness are less likely to perceive events as stressful, or better able to engage in positive reappraisal when stress is experienced, both of which could reduce exposure to the negative experience of stress.

Another means by which mindfulness may promote positive health outcomes is through the process of savouring (Garland, Farb, Goldin, & Fredrickson, 2015). To savour is to notice and appreciate positive experiences (Ritchie & Bryant, 2012). Through this appreciation, savouring can generate positive mood and emotions, both of which contribute to psychological and physical health (Fredrickson, 2001). The link between decentering and savouring has been made in the context of stress appraisal. By reframing initially stressful events as meaningful or as growth promoting (Lazarus & Folkman, 1984), positive reappraisal can help individuals to see the good aspects of an experience; aspects which may have been otherwise overlooked (Bryant & Smith, 2015). This creates the possibility, and opportunity, for those positive aspects to be savoured (Garland et al., 2015).

This link between mindfulness and savouring, through the mechanisms of decentering and positive reappraisal of stressful events or circumstances, has empirical support (Garland, Hanley, Goldin, & Gross, 2017). But savouring may also be connected to mindfulness in a more general way, in settings other than stressful or negative situations. Adversity is not a

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necessary precondition to savouring (Bryant & Smith, 2015); what is necessary for individuals to appreciate and savour something in their environment is that they first notice that thing. Individuals with a mindful (and therefore open and aware) outlook may be naturally more able and likely to notice the pleasant or positive aspects of their day to day lives (Geschwind, Peeters, Drukker, van Os, & Wichers, 2011). Mindfulness may, therefore, facilitate savouring (Kiken, Lundberg, & Fredrickson, 2017), with mindful individuals benefitting from the positive mood and emotion that savouring brings.

The present thesis: Theoretical Framework

The overall aim of this thesis is to explore different ways in which mindfulness may assist sport coaches in maintaining wellbeing, in the face of the many and varied demands their jobs involve. The Job Demands-Resources Model (JD-R) (Demerouti, Bakker, Nachreiner & Shaufeli, 2001) provides a theoretical framework for this aim. According to JD-R, job conditions can be grouped into two broad categories; demands (physical, psychological or organisational characteristics of the job which require effort to meet), and resources which help meet or counter those demands (Demerouti et al., 2001). Together, demands and resources are thought to predict different wellbeing related outcomes. Resources enable workers to complete tasks and achieve goals, and have been related to positive states such as engagement and motivation (Tadic, Bakker & Oerlemans, 2015). Demands, on the other hand, can involve physical and psychological effort and are therefore related to negative states such as exhaustion and burnout (Demerouti et al., 2001). JD-R posits, however, that there is an interaction between job demands and resources, and that resources can effectively buffer the potentially negative effects of job demands. It is where there is an imbalance between the two, and an individual faces job demands which outweigh the resources available to them, that feelings of stress and

stain can result (Bakker & Demerouti, 2007). Over time, those negative outcomes may lead to impaired health and poor wellbeing (Kinnunen, Feldt, Siltaloppi & Sonnentag, 2011). As noted earlier in this chapter, coaches typically face a large volume and variety of demands, and many carry out their roles with limited resources or social support (Malinauskas, Malinauskiene, & Dumciene, 2010). Thus, it is likely that demands are appraised as outweighing available resources, explaining the prevalence of stress, strain, and burnout amongst coaches.

In the initial conceptualisation of JD-R, resources were deemed job related (e.g., physical resources, coaching, feedback, social support) (Bakker & Demerouti, 2014). However, the model has since been extended to include personal resources (Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007). Broadly defined, personal resources are aspects of the self that allow an individual to feel they can successfully control and impact upon their environment (Hobfoll, Johnson, Ennis & Jackson, 2003; Kinnunen et al., 2011). Such aspects could include personal characteristics, emotional and psychological resources, and, importantly in the work context, energetic resources. In the context of JD-R, the present thesis considers ways in which mindfulness may act as a personal resource (Grover, Teo, Pick & Roche, 2016), influencing the way in which coaches view, and are able to meet, the demands of their work, thus potentially impacting wellbeing outcomes.

It may not necessarily be the case that mindfulness acts as a resource which directly counters work demands. Rather, mindfulness may impact the extent to which individuals can maintain and utilise other valuable personal resources. Personal resources are not always stable over time; some are considered volatile (e.g., energy) or temporal (e.g., mood) (Ten Brummelhuis & Bakker, 2012). Such resources are drawn on and even depleted in the effort to meet work demands. If those resources are not somehow restored, they will be insufficient to meet subsequent work demands, leading to an imbalance between demands and available resources. Therefore, if wellbeing is to be maintained the personal resources used during the

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working day need to be replenished – a process termed 'recovery' (Geurts & Sonnentag, 2006). Recovery processes, and related theories including the Effort Recovery Model, and Conservation of Resources Theory, are discussed in Chapters 2 and 3 (Studies 1 and 2) of the thesis. Those studies examine the role of mindfulness in allowing coaches to experience a reprieve from the demands of their work, thus allowing for replenishment of the personal resources that are drawn on to meet those cognitive demands.

Mindfulness may also be an important in terms of the influence it has on appraisal of job demands, and availability of other potential resources. Demands and resources are perceived differently by different people in any work setting. In the coaching context, what feels hugely challenging to one coach may be only moderately so to the next. Similarly, one coach may find their job resources sufficient to deal with demands, while another, facing the same demands and armed with the same job resources, may struggle to cope. The Transactional Theory of Stress helps to explain these individual differences. According to the transactional theory, psychological stress is the result of an appraisal process (Lazarus & Folkman, 1984). When confronted with a potentially stressful situation, an individual weighs up the scale of the threat they are facing, as well as the coping options and resources available to them to meet the threat (Lazarus, 2006). If the potential coping resources or options are insufficient to counter the threat, feelings of stress will result. The transactional theory therefore connects with JD-R, in that similar appraisal processes may explain differences between, and sometimes within, individuals, in terms of the way that demands are appraised. Study 3 (Chapter 4) in the present thesis focuses on mindfulness and appraisal processes, exploring relationships between mindfulness levels and the types of demands that are noted by coaches as sources of stress.

Study 3 in the thesis also considers mindfulness as a potential resource-building mechanism. The study investigates whether mindfulness is related to coaches' propensity to notice positive events in their day. Appreciation of positive events can trigger positive

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emotions, which in turn are thought to build personal resources (Fredrickson, 2001). Thus, mindfulness may assist coaches in acquiring resources, which can then be drawn on to help meet varied work demands.

Figure 1 provides an overview of the studies in the present thesis. Studies 1 and 2 focus on pathways between mindfulness and outcomes variables related to recovery from work demands. Those outcome variables also represent aspects of coach wellbeing and are discussed more fully in the respective studies. Study 3 focuses on relationships between mindfulness, and both stress appraisal and awareness of positive events, both of which have been theoretically and empirically linked to wellbeing outcomes (e.g., McEwen, 1998; Fredrickson, 2001).
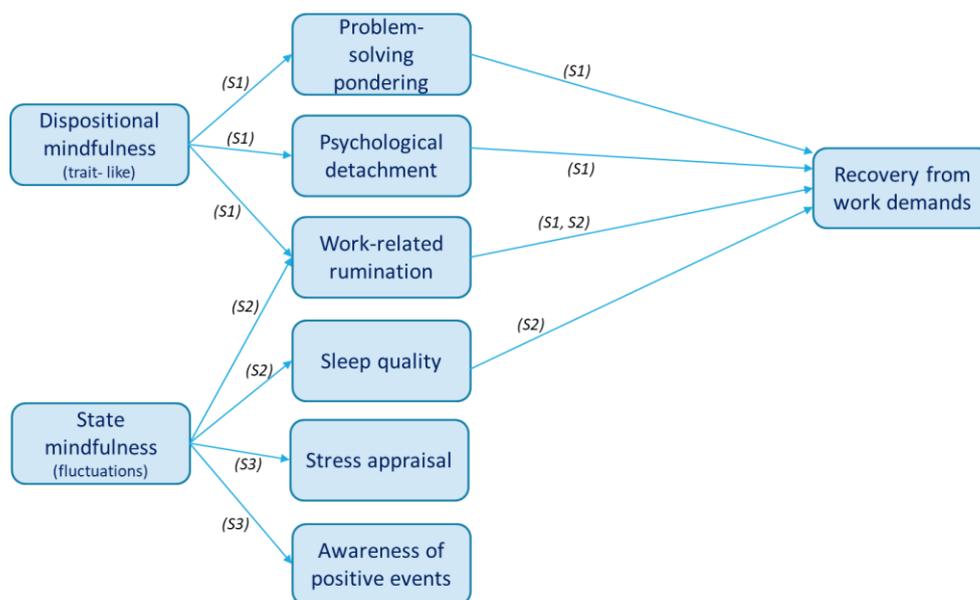
Figure 1: Overall conceptual design of thesis. Note: S1, S2 and S3 refer to Studies 1, 2 and 3 respectively.

Theoretical and practical contributions

Coaches are an integral part of the sporting infrastructure, and influence both sport participation and performance. However, the coaching role can be a demanding one, and coach wellbeing is an often-overlooked area. This research addresses the issue of coach wellbeing, making contributions and offering insights which (a) extend the current literature on coaching demands and and personal resources (academic contribution), (b) are of practical value to coaches and those who support them (practical contribution), (c) are relevant to the make-up of the coaching sector in New Zealand (context-specific contribution), and (d) are practically relevant for coaches from varied backgrounds and levels (diversity contribution). More detail on these contributions is outlined below.

This research contributes to the literature on demands and challenges faced by sport coaches. Much is known about demands of coaching including, as detailed earlier in the chapter, the wide range and volume of tasks associated with their role (Fletcher & Scott, 2010; Potrac et al., 2017; Taylor, 1992), a lack of training for those tasks (Busser & Carruthers, 2010), performance pressure (Giges et al., 2004) and the pressure of combining their coaching role with other forms of employment (Capel et al., 1987). However, less is known about how coaches maintain wellbeing and performance, in the face of those demands. This research looks at the psychological state of mindfulness as a personal resource, potentially helping explain why some coaches maintain better wellbeing when dealing with the day to day demands of their work, than others. JD-R provides an overall theoretical framework to the thesis, and the research conducted in this thesis contributes to further support that model, particularly with regard to personal resources, and to related processes such as recovery.

By learning more about the ways that mindfulness, as a resource, benefits coaches, foundations are laid for the potential use of mindfulness training as a practical means to

promote coach wellbeing. The present research explores relationships between mindfulness and recovery from work demands (Studies 1 and 2); mindfulness and stress appraisal (Study 3); and mindfulness and the propensity to appreciate positive events (Study 3). Each of these present a potential path by which mindfulness be related to wellbeing. If the results of the study provide support for or confirmation of these pathways, then mindfulness could be considered an important resource for maintaining wellbeing while meeting the demands and challenges inherent in coaching work. Mindfulness can be enhanced through training, and this need not only be through formal practices; mindfulness can be built into the tasks and activities of daily life (Allen & Kiburz, 2012), to help cultivate mindfulness in any situation (Kostanski & Hassed, 2008).

Participants in the present research are all New Zealand based coaches. This means that insights gained are relevant and meaningful to the coaching sector in New Zealand, and this is significant given the importance of sport to New Zealand's culture and identity (Angus & Associates, 2017; Grant, 1992). If research is to inform ways of promoting wellbeing for New Zealand coaches and those around them including broader communities (Keegan et al., 2009), it is important that the research is based on New Zealand coach experiences.

As well as being relevant to the New Zealand context, this research draws on a broad range of coaches' experiences. Participants in the three studies presented in the thesis were from a range of coaching backgrounds and levels, ranging from community and club level through to high performance. Most managed their coaching roles around other forms of employment. This is in contrast to the majority of coach research relating to issues such as stress, burnout, and wellbeing, which has mostly focused on coaches who work on a full-time basis at a competitive, professional level (Potts, Didymus, & Kaiseler, 2019). In addition, past studies have focused on samples of coaches from one level of coaching; for example, professional coaches (Kellmann, Altfeld, & Mallett, 2016) and high-performance coaches

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(Bentzen et al., 2016a), rather than including coaches from a range of coaching levels. By including a diverse range of coaches in the study samples, the present research reflects the actual makeup of the coaching sector in New Zealand.

An overview of the thesis: three studies

The first study in the thesis (Chapter 2) draws on literature from the sport coaching, occupational health, and mindfulness fields. The study is cross sectional in design, and tests for relationships between mindfulness, and outcome variables which reflect recovery from work demands. Different forms of work-related rumination are proposed as mediating mechanisms.

The second study (Chapter 3) builds on the first, in that it also focuses on relationships between mindfulness and recovery work demands. This study is longitudinal, with data collected from participants on a daily basis over a period of 28 consecutive days. The 'daily diary' design allows for analysis of relationships between variables at the within person level. This reflects conceptualisation of recovery as a process that takes place within individuals, and mindfulness as a state that can vary from day to day.

The third and final study (Chapter 4) also draws on daily diary data. Qualitative diary entries were examined and coded for quantitative analysis purposes. Instead of focusing on recovery, this study looks for evidence of other mechanisms by which mindfulness promotes coach wellbeing. In particular, data is analysed in terms of frequency of stress appraisals, and the frequency and type of positive events noted in the daily diaries, in relation to daily mindfulness levels.

Chapter 2: Sport coaches, mindfulness and recovery from work demands (Study 1)

In most forms of organised sport, from grassroots through to elite level, the coach is a key figure. Coaching is a multifaceted role; coaches can find themselves organising, facilitating, managing, encouraging, teaching, and influencing. They have a role in stimulating and sustaining participation in recreational sport, as well as in improving performance (Fletcher & Scott, 2010). Coaches are in a position to facilitate not just the development of sport related physical and mental skills, but also the personal and social development of their athletes (Fletcher & Scott, 2010). Whether working with beginners or elite, coaches work to create an environment that allows athletes to achieve goals and perform well. Supporting athletes is a priority, and coaches can tend to put their athletes, players, and commitments to the sport first, and themselves second (Longshore & Sachs, 2015), meaning coach wellbeing is often overlooked. This may be to the detriment of coaches and athletes alike. Amongst researchers there is a growing awareness of the influence that coach well-being and coach performance can have on athlete outcomes (Norris et al., 2017). If a coach is mentally or physically below their best it may be more difficult for them to create a positive and supportive environment for athletes and sportspeople. Therefore, promotion of coach wellbeing is important not just for the good of the coach, but for athletes, sports participants, and sport culture in general.

Coach stress

While coaching is undoubtedly a rewarding role it can also be stressful. This is the case for coaches at any level from community level to high performance (Potts et al., 2019), and the experience of stress is one of the main challenges to sustainable coach wellbeing. Known

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causes of stress include competitive performance expectations, set either by the coaches themselves or by others, as well as the demands that come with having multiple roles and responsibilities (Frey, 2007). Many coaches find themselves wearing multiple 'hats', taking on tasks outside of the coaching role including administration, education and planning (McNeill et al., 2017). Some coaches work in isolated positions with limited support (Thelwell, Weston, Greenlees, & Hutchings, 2008), while others find themselves managing a team of staff as well as athletes, giving rise to role conflict (Olusoga, Butt, Hays, & Maynard, 2009). Imbalance between job demands and resources is considered a cause of work stress and strain (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) and such an imbalance is likely the case for many coaches who are required to do 'more with less', their high demands being met with limited financial, social or instrumental support. Additionally, sport coaching is known to generate a large amount of work-life conflict, as a result of non-traditional work hours, the frequent need for travel, and a general expectation that coaches should have a high level of availability and commitment to athletes (Dixon & Bruening, 2007), all of which can generate or contribute to feelings of stress.

Short term or intermittent stressful episodes can be unpleasant for coaches and those around them. But of greater concern is the potential for prolonged stress and strain to lead to coach burnout (Kelley, 1994). The core dimension of burnout is emotional exhaustion, defined as exhaustion resulting from prolonged work life stress (Lundkvist, Stenling, Gustafsson, & Hassmén, 2014). Other recognised dimensions of burnout are cynicism, and lack of personal accomplishment (Maslach, Jackson, & Leiter, 1981). In the coaching profession, the impact of burnout can reach well beyond the affected coach. Coaches experiencing burnout may withdraw from coach-athlete interactions and demonstrate less care for their players or teams (Price & Weiss, 2000). Such behaviours may have a detrimental impact on the coach-athlete relationship, with a negative flow on effect to athlete participation and performance (Stebbings,

Taylor, & Spray, 2015; Thelwell, Wagstaff, Chapman, & Kenttä, 2016). There is also the risk that burnt out coaches will choose to leave the profession altogether (Kilo & Hassmén, 2016), taking with them expertise, knowledge and valuable professional experience. Burnout therefore presents a significant challenge to coach performance, and to coach retention.

There is an existing body of research on the causes and implications of coach stress and burnout, but as yet little attention has been paid to factors that prevent day to day stress progressing to a state of burnout. Many coaches do reach the top of their profession without suffering from exhaustion or burnout, despite very high pressures and demands. While it is possible that these coaches are more resilient than others and more likely to handle the demands of the job (Hjälm et al., 2007) another explanation is that they have been protected from burnout because they have been able to sufficiently recover from work demands (Kellmann, Altfeld, & Mallett, 2015). Here, findings from general work stress literature can be usefully applied to the coaching context.

Work stress and recovery

According to the Effort Recovery Model (Meijman & Mulder, 1998), task, organisational, and psychological demands experienced during worktime place 'load', or demands, on an individual. Responses to this load can be behavioural and subjective, such as changes in mood or feelings of anxiety, as well as physiological. Psychophysiological systems are activated, evident in changes in heart rate variability and blood pressure, and secretion of stress hormones including adrenaline and noradrenaline (Ilies, Dimotakis, & De Pater, 2010). This activation is adaptive, helping the individual to meet work demands. Usually, activation is also short term, temporary, and reversible. When work is done for the day, work demands ease and the associated load reduces, allowing psychophysiological systems to stabilise and return to normal pre-activation levels within a reasonable timeframe (Meijman & Mulder,

1998). This process is referred to as recovery. When recovery is effective, there should be little or no lasting ill effect resulting from work demands, because recovery will ensure that sufficient resources are maintained to meet job demands (Demerouti, Bakker, Geurts, & Taris, 2009). Individuals who are able to recover effectively outside of work are, therefore, less likely to be worn down and eventually burnt out by the day to day demands of their work.

The concept of recovery will be familiar to sport coaches; the Effort Recovery Model was originally based on exercise physiology principles (Meijman & Mulder, 1998). Within sport and exercise science it is well understood that very high physical effort cannot be maintained for too long, and that when recovery and relaxation is infrequent or insufficient, or both, both the psychological wellbeing and physical performance of athletes will decline (Kellmann et al., 2018). Coaches are careful to schedule and prioritise rest periods for their athletes, and to advise athletes to undertake recovery activities in preparation for upcoming demands (Altfeld, Schaffran, Kleinert & Kellmann, 2018). The same should be applied in the work context, where expended effort is often more cognitive or emotional than it is physical. Just as muscles need rest and recovery in between time of high effort, so does the brain. Workers who achieve regular and sufficient mental recovery can often maintain job performance even when demands and stressors are high (Sonnentag, Binnewies, & Mojza, 2010). Insufficient recovery, on the other hand, is problematic. If someone returns to work not fully recovered from the demands of the previous day, they will need to expend greater effort and more resources to complete their work tasks, which in turn will further increase their need for recovery (Geurts & Sonnentag, 2006). Additionally, the effects of psychophysiological activation can accumulate (Sonnentag, 2001), resulting in what McEwen and Seeman (1999) term 'allostatic load' or wear and tear on the body's systems. Higher levels of allostatic load, resulting from exposure to work stress, have been found to predict harmful physiological health changes (Coronado, Chandola, & Steptoe, 2018). For this reason, allostatic load is considered

the pathway by which lack of recovery leads to ill health and burnout (Geurts & Sonnentag, 2006; Sonnentag & Fritz, 2015). Too much 'wear and tear' can result in workers being both mentally and physically worn out, and unable to keep performing at or near their best.

Recovery is most often operationalised in negative terms, in that symptoms and signs of strain indicate a lack of recovery. Such symptoms include feelings of work-related tiredness, irritability, and a desire to withdraw socially (Van Veldhoven & Broersen, 2003). Sleep difficulties can also be an indicator of lack of recovery. If someone is still physiologically aroused when going to bed, because they have not 'wound down' from the demands of their work, they may have difficulty falling asleep or experience poor quality sleep (Zijlstra & Sonnentag, 2006). People who have experienced long periods of insufficient recovery may feel emotionally and physically depleted, with long-term feelings of exhaustion and fatigue that cannot be reduced by normal rest (Cropanzano, Rupp, & Byrne, 2003). Lack of recovery over time can contribute to short and long term fatigue, and ultimately to burnout. It is therefore in the interests of workers and of organisations to acknowledge the importance of recovery, and to take steps to ensure that recovery is achieved.

Factors which facilitate recovery

For some workers, getting regular and sufficient recovery from work demands is easy but for others it can be challenging. Ideally, leaving work at the end of the day and taking a break from the workplace and work tasks would be enough to allow a complete recovery process to occur. However, people often think about work in their non-work time and work-related thoughts can impede the recovery process. For example, ruminating on past problems at work, or anticipating future challenges, can trigger the physiological stress response (Brosschot, Verkuil, & Thayer, 2010; Geurts & Sonnentag, 2006), maintaining and prolonging psychophysiological activation. This sustained activation, beyond working hours, can

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compromise or interfere with the recovery process (Geurts & Sonnentag, 2006), making it difficult for workers to recharge during the limited period of time they have away from work.

The ability to mentally switch off or 'psychologically detach' from work is, on the other hand, considered a prototypical recovery experience (Sonnentag & Fritz, 2015; Sonnentag, Mojza, Binnewies, & Scholl, 2008). When someone is psychologically detached from work, they are mentally, as well as physically, experiencing a true break from work demands. This allows for the reversal and unwinding of work activated systems. Psychological detachment has been shown to predict recovery related outcomes such as positive mood and low fatigue, even when work demands are high (Sonnentag & Bayer, 2005).

Research shows that psychological detachment enhances recovery and thinking about work hinders the process (e.g., Sonnentag & Bayer, 2005). But work-related thoughts can be positive as well as negative, and the tone of such thoughts may impact on the degree to which they influence recovery. Cropley and Zijlstra (2011) argue for a three-factor conceptualisation of work-related rumination. Within this framework, 'affective rumination' refers to perseverative cognitions which are cognitively and emotionally intrusive. 'Problem solving pondering' describes work related thought that, rather than being negative, is goal directed and often positive and which could actually assist in problem solving with regard to work challenges. Finally, Cropley and Zijlstra (2011) include 'psychological detachment' as a factor in their conceptualisation of work-related rumination. With its usual meaning of being mentally removed from the work situation, psychological detachment stands in contrast to the other two forms of rumination. Applying the principles of the Effort Recovery Model to each conceptualisation of rumination, it could be expected that affective rumination would trigger or maintain a stress response, thus keeping psychophysiological systems activated and meaning a need for recovery would remain. Problem solving pondering may not generate feelings of stress but would likely still draw on some of the systems used during the working day, and

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therefore still impede recovery to a degree. Psychological detachment would, on the other hand, provide opportunity for effective winding down from work activities and demands, resulting in the lowest remaining need for recovery.

Given that coaching can be a job with high demands, low resources, and many sources of pressure, stress and strain amongst coaches is common. Work stress literature suggests that regular and sufficient recovery is vital if worker wellbeing and performance is to be maintained over time (Demerouti et al., 2009), and that the ability and opportunity to psychologically detach from the work situation are important factors in the recovery process (Sonnentag & Bayer, 2005). For many workers, strategies such as engaging in leisure activities, having fixed working hours, and establishing clear boundaries between home and work, help to achieve detachment. For sport coaches, however, such strategies can be challenging to implement, making psychological detachment difficult (McNeill et al., 2017). Unusual working hours such as working in the evening and weekends, high levels of work-home interference, and a perceived need to be available to athletes at all times, can all mean that 'leisure' time is frequently interrupted with work or even taken up by coaching related activity, at the expense of recovery (Altfeld et al., 2018; Kellmann, Altfeld & Mallett, 2016). In addition to this, many coaches actively participate in or follow the sport they coach as a form of recreation. This means that instead of providing an opportunity to get away from work, mentally as well as physically, leisure activities might be closely connected to the work environment, potentially triggering work related thoughts and decreasing the chances of good recovery from work (Geurts & Sonnentag, 2006; Sonnentag & Bayer, 2005). For those coaches whose work and leisure activities are closely intertwined, true downtime from work may not come easily.

As previously noted, not all coaches suffer from exhaustion or burnout, even when work demands are high. This ability to maintain energy and vigour, despite demands, may be explained by the possibility that some coaches are more able than others to switch off from

work related thoughts, particularly negative ruminative thought, and can therefore achieve sufficient recovery from work demands. One psychological state which may promote detachment from work during non-work time, and make negative rumination less likely, is mindfulness. As outlined in the following section, it is possible that coaches who are high in mindfulness are in a better position to recover from work stress and strain, even when demands are high.

Mindfulness

To be mindful is to pay attention in a particular way (Kabat-Zinn & Hanh, 2009); to be attentive to and aware of present events and experience, with an open and non-judgmental attitude (Brown & Ryan, 2003). Mindfulness has been conceptualized as both a state, cultivated, developed and enhanced by training and practice, and as a naturally occurring trait or disposition (Brown et al., 2007b), distinct from other personality constructs (Hülsheger et al., 2013). Recent research shows that the frequency with which people experience mindful states varies between individuals, suggesting a dispositional tendency toward mindfulness (Davidson, 2010; Mesmer-Magnus, Manapragada, Viswesvaran, & Allen, 2017a). This means some people are naturally higher in mindfulness than others, without taking part in mindfulness training (Brown, Ryan, & Creswell, 2007a). It is this dispositional or trait mindfulness which is measured in the present study.

Dispositional mindfulness has been linked to a greater propensity to psychologically detach from work (Hülsheger et al., 2015). Given that a core element of mindfulness is attention to the present moment, mindful individuals are more likely to be focused on the present and less likely to allow thoughts to turn to work 'after hours' or when they are not physically at work (Hülsheger et al., 2014), increasing the degree to which they can 'switch off' from work related issues. It has been suggested that mindful individuals have an ability to create mental

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boundaries between work and non-work domains (Michel, Bosch, & Rexroth, 2014), possibly making it easier to confine work related thoughts to work time.

Additionally, and importantly, mindfulness may decrease the likelihood that individuals engage in ruminative thought patterns. This is important in the context of recovery, because ruminative thought can prolong the cognitive and emotional demands of work beyond work hours, making it difficult for psychophysiological systems to deactivate and for recovery to occur. Mindfulness has been linked to the degree of objectivity with which individuals view both external events and internal experiences or thoughts (Glomb et al., 2011). While an individual lower in mindfulness might quickly judge events and react accordingly, someone higher in mindfulness would simply observe and experience those events and thoughts. They would not automatically assign meaning, a narrative, or mental interpretation (Hülsheger et al., 2014; Shapiro et al., 2006). This increased capacity to be objective toward both external and internal experience, and to separate the self from events (Mesmer-Magnus et al., 2017a), has been linked to better emotion regulation and an increased ability to let go of thoughts (Frewen, Evans, Maraj, Dozois, & Partridge, 2008), as well as decreased reactivity to negative events, and less judgment and dwelling on the causes and consequences of those events (Hülsheger et al., 2015). Together, these findings suggest that mindful individuals are less likely to engage in negative ruminative thought. Research supports this suggestion; dispositional mindfulness has been found to be negatively related to rumination amongst athletes (Josefsson et al., 2017) and in organisational settings (Glomb et al., 2011). If work-related rumination is one of the main barriers to good recovery from work demands, mindfulness might be an important enabler of recovery.

The present research

There is a relatively large body of research on the causes and consequences of coach stress, but little attention has been paid to how to prevent daily stressors and strains from leading to exhaustion and burnout. The present study addresses this, by applying work stress theory to the coaching context to explain recovery processes, and by drawing on mindfulness literature to offer a potential explanation for why some coaches might be better able than others to recover from work demands. It is proposed that coaches who are higher in mindfulness may be better able to recover from work demands because of either an increased ability to psychologically detach from work thoughts, a decreased likelihood to engage in ruminative work-related thought processes, or both.

Accordingly, the first two hypotheses relate to possible relationships between dispositional mindfulness, and psychological detachment, affective rumination, and problem-solving pondering. Based on mindfulness literature, it is predicted that:

- Hypothesis 1: Dispositional mindfulness is positively related to psychological detachment from work

- Hypothesis 2: Dispositional mindfulness is negatively related to a) work-related affective rumination and b) work-related problem-solving pondering

If Hypothesis 1 and Hypothesis 2 are supported, it is expected that there will be a negative relationship between mindfulness and indicators of insufficient recovery, in that coaches who are more mindful will be less likely to experience outcomes associated with poor recovery. It is hypothesized that this relationship will be indirect, via the mechanisms of increased psychological detachment and reduced work-related rumination. The third hypothesis, therefore, proposes a mediation model:

- Hypothesis 3: Dispositional mindfulness is negatively related to indicators of insufficient recovery, and this hypothesized relationship is mediated by a) higher psychological detachment b) lower work-related affective rumination and c) lower problem-solving pondering.

Authors of a recent systematic review of stress and coping amongst sport coaches (Norris et al., 2017) highlighted that most of the existing coach research focuses on high performance or elite coaches, and that there is a notable absence of research on coaches working at lower levels. They called for attention to be given to coaches at sub-elite levels, if sport participation is to be maintained, coaches retained, and promising coaches developed. The present research responds to this call, by collecting data from a participant group made up of a wide range of coaches working at different levels.

Research on mindfulness amongst sport coaches is limited, despite the growing interest in and use of mindfulness techniques within sports psychology. Two studies have evaluated the effects of mindfulness interventions for coaches in terms of reducing stress (Lundqvist, Ståhl, Kenttä, & Thulin, 2018), and decreasing anxiety and promoting wellbeing (Longshore & Sachs, 2015). However, no research has yet considered the role that dispositional mindfulness may play in coach wellbeing. The present study addresses this research gap.

Methods

Participants and procedure

Participants were recruited at a national sport coach's conference, as well through emails sent via a number of regional sport governing bodies. In total, 143 sport coaches, all of whom were based in New Zealand and actively involved in coaching, participated in the study. The majority were male (n = 93, 65%) and identifying as NZ European (n = 107, 73%). The largest age bracket was 20 - 29 years (n = 40, 28%) but participants ranged from under 20 years

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of age (n = 2) to 65 years and over (n = 14). Coaching was the primary form of employment for only 33 participants, representing 25% of the sample. The remaining 75% worked other jobs in addition to their coaching roles. Coaches from all levels (i.e., beginner and grassroots coaching through to high performance) were represented, and the majority of coaches worked across a range of levels.

Participants were sent an anonymous link to an online survey, which was accessed through Qualtrics Survey software. The survey could be completed on a computer, smartphone, or other mobile device. Approval for the study was provided by the University of Canterbury Human Ethics Committee, and in accordance with that approval participants were required to read and agree to an information and consent page before proceeding to the first page of questions. All participants were given the option of entering a draw for a shopping voucher, as a thank you for their time.

Survey measures

Predictor variable

To measure the predictor variable, dispositional mindfulness, the survey included the Mindfulness Attention and Awareness (MAAS) Scale (Brown & Ryan, 2003). This scale has a long track record as a valid measure of dispositional mindfulness (Black, Sussman, Johnson, & Milam, 2012). An example of one of the 15 scale items is 'I find it difficult to stay focused on what's happening in the present.' Responses to this and all other items were given on a 1-7 Likert scale (1 = strongly disagree, 7 = strongly agree). Prior to analysis all items were reverse scored, so that a higher score on the scale would represent higher mindfulness levels. One item, "I forget a person's name almost as soon as I've been told it for the first time," was removed due to it contributing to a much lower alpha if included, leaving a 14-item scale with a strong Cronbach's Alpha of.87.

Mediator variables

The Work-Related Rumination Questionnaire (Querstret & Cropley, 2012) was included in the survey to measure the proposed mediator variables. The questionnaire includes a separate subscale for each conceptualisation of rumination and collects responses on a 1-7 Likert scale (1 = strongly disagree, 7 = strongly agree). In the survey, participants were advised that if coaching was not their only occupation, they should think about their coaching work in particular (rather than other forms of employment) when answering the questions. Examples from each of the subscales include "I become tense when thinking about work related issues during my free time" (affective rumination); "I find solutions to work related problems in my free time" (problem solving pondering) and "I leave work issues behind me when I leave work" (psychological detachment). Cronbach's Alphas for the subscales ranged from.82 to.84.

Outcome variables

Need for Recovery: The survey included eight items from the 'Need for Recovery Scale' (Van Veldhoven & Broersen, 2003), with a Cronbach's Alpha of .90. The scale is designed to measure early signs of work related fatigue and includes items such as "I find it difficult to relax at the end of a working day". As with other measures, responses were provided on a 1 – 7 Likert Scale (1 = strongly disagree, 7 = strongly agree). A higher overall score would indicate a higher need for recovery.

Emotional Exhaustion: A core dimension of burnout, this was measured using eight items from the Maslach Burnout Inventory (Maslach et al., 1981) and included items such as "I feel used up at the end of a workday." Reliability analysis showed an excellent Cronbach's Alpha of .93. Participants were asked how frequently they experienced the states described in each scale item, with potential responses ranging from 1 (a few times a year) to 5 (almost every day), meaning a higher score represented more frequent experiences of emotional exhaustion.

Sleep Quality: Participants were asked to recall frequency of particular sleep complaints over the last month, by responding to six items from the Karolinska Sleep Scale (Nordin, Åkerstedt, & Nordin, 2013), Frequency was indicated on a 1 – 5 scale (1 = never, 5 = always). Reliability analysis of the six-item scale, which included complaints such as such as restless sleep or difficulties falling asleep, showed a Cronbach's Alpha of .84.

Control Variables

Two control variables were included in the analysis. The first was perceived stress; it was considered that participants experiencing more stress might find it more difficult to detach from work issues. Perceived stress was measured using a 10-item scale (Cronbach's Alpha .87) taken from the Short Form Perceived Stress Scale (Warttig, Forshaw, South, & White, 2013). An example of an item is "In the last month, how often have you felt that you were on top of things", with a response range from 1 'never' to 5 'always.' Emotional Stability was included as a further control variable, because of a potential relationship between emotional stability and rumination. Emotional stability was measured using a 10-item scale taken from the International Personality Item Pool (IPIP), with one item removed after reliability analysis. An example item is "I worry about things," answered on a 5-point scale (1 describes me extremely well; 5 does not describe me). Most items on this scale were reverse coded, with a higher overall score representing greater emotional stability. The nine-item scale had a Cronbach's Alpha of .85.

Results

All data analyses were conducted using SPSS version 24.

First, bivariate correlations were run on all study variables. Results, as well as descriptive statistics, are displayed in Table 1.

Table 1: Descriptive statistics and correlations of all study variables.

		M	SD	1	2	3	4	5	6	7	8
1	Mindfulness	4.49	0.49								
2	Emotional Stability	3.39	0.64	.36*							
3	Perceived Stress	2.28	0.62	-.48*	-.60*						
4	Affective Rumination	2.07	0.68	-.47*	-.47*	.62*					
5	Problem Solving Pondering	2.72	0.70	-.28*	.12	.09	.23*				
6	Psychological Detachment	3.03	0.85	.33*	-.31*	-.44*	-.52*	-.38*			
7	Need for Recovery	3.26	1.32	-.41*	-.51*	.52*	.61*	.16	-.50*		
8	Emotional Exhaustion	1.94	.97	-.41*	-.48*	.57*	.61*	.13	-.38*	.65*	
9	Sleep Difficulties	2.16	0.74	-.34*	-.36*	.29*	.17*	.07	-.14	.31*	.33*

Note: n = 143. *Correlation is significant at the 0.05 level

To test the study hypotheses, mediation analyses were conducted using the SPSS Process macro developed by Hayes (2012). The Process macro uses a bootstrapping method to create a large sample (5000 in these analyses) from the original data, then constructs confidence intervals around the direct and indirect effects (95% in this case). If the confidence interval does not contain zero, coefficients are considered significant (Tandoc, Ferrucci, & Duffy, 2015). Mediation is indicated by a significant indirect effect (Hayes, 2012).

The conceptual model is shown in Figure 1. The model included dispositional mindfulness as the independent variable, with psychological detachment, affective rumination and problem-solving pondering as parallel mediators. The dependent variables were emotional exhaustion, need for recovery, and sleep difficulties. Emotional stability and perceived stress were included in the analyses as covariates, as they correlated significantly with other study variables. Separate bootstrap analyses were conducted for each of the three dependent variables.
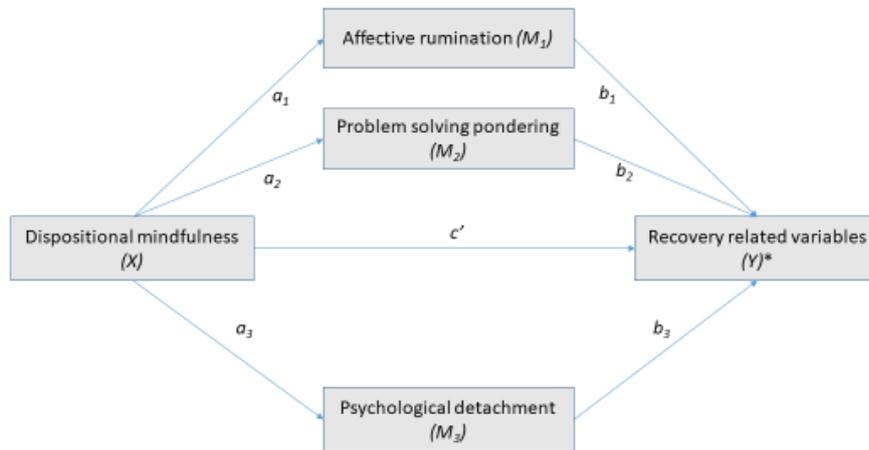
Figure 2: Conceptual model of relationships between variables (Study 1)

*Note: Recovery related variables (y) are Emotional Exhaustion, Need for Recovery, and Sleep Difficulties.

Results of the mediation analyses are shown in Tables 2-4 and demonstrate differing relationships between mindfulness and each of the three dependent variables.

Table 2: Results of mediation analysis for outcome variable Need for Recovery

Path	Effect	LLCI	ULCI	SE	t	*p*-value
Total Effect *(c)*	-0.48	-0.86	-0.09	0.20	-2.43	0.016
Direct Effect *(c')*	-0.25	-0.63	0.12	0.19	-1.33	0.186
a_1	-0.29	-0.48	-0.10	0.10	-2.10	0.003
a_2	-0.40	-0.65	-0.15	0.13	-3.17	0.002
a_3	0.27	-0.01	0.54	0.14	1.91	0.059
b_1	0.59	0.26	0.92	0.17	3.59	0.001
b_2	-0.09	-0.35	0.16	0.13	-0.72	0.473
b_3	-0.33	-0.57	-0.10	0.12	-2.77	0.006
Indirect Effect	-0.22	-0.51	-0.03	0.12		
a_1b_1	-0.17	-0.42	-0.04	0.10		
a_2b_2	0.04	-0.06	0.19	0.06		
a_3b_3	-0.09	-0.23	-0.01	0.05		

Table 3: Results of mediation analysis for outcome variable Emotional Exhaustion

Path	Effect	LLCI	ULCI	SE	t	p-value
Total Effect *(c)*	-0.24	-0.52	0.03	0.14	-1.73	0.085
Direct Effect *(c')*	-0.10	-0.38	0.18	0.14	-0.71	0.478
a_1	-0.28	-0.47	-0.09	0.10	-2.93	0.004
a_2	-0.41	-0.66	-0.16	0.13	-3.26	0.001
a_3	0.25	-0.03	0.53	0.14	1.79	0.076
b_1	0.52	0.28	0.76	0.12	4.25	0.000
b_2	-0.04	-0.22	0.15	0.09	-0.40	0.693
b_3	-0.06	-0.23	0.12	0.10	-0.65	0.517
Indirect Effect	-0.14	-0.35	0.00	0.09		
a_1b_1	-0.15	-0.32	-0.03	0.07		
a_2b_2	0.02	-0.06	0.12	0.04		
a_3b_3	-0.01	-0.09	0.03	0.03		

Table 4: Results of mediation analysis for outcome variable Sleep Difficulties

Path	Effect	LLCI	ULCI	SE	t	p-value
Total Effect *(c)*	-0.36	-0.61	-0.10	0.13	-2.78	0.006
Direct Effect *(c')*	-0.20	-0.66	-0.12	0.14	-2.83	0.005
a_1	-0.28	-0.47	-0.09	0.10	-2.93	0.004
a_2	-0.41	-0.66	-0.16	0.13	-3.26	0.001
a_3	0.25	-0.03	0.53	0.14	-3.12	0.076
b_1	-0.09	-0.33	0.14	0.12	-0.77	0.444
b_2	-0.04	-0.22	0.14	0.09	-0.45	0.651
b_3	-0.06	-0.23	0.12	0.09	-0.63	0.529
Indirect Effect	0.03	-0.08	0.17	0.06		
a_1b_1	0.03	-0.06	0.14	0.05		
a_2b_2	0.02	-0.04	0.12	0.04		
a_3b_3	-0.01	-0.10	0.03	0.03		

First it should be noted that when other variables were controlled for, mindfulness was a significant negative predictor of affective rumination and of problem-solving pondering, but not a statistically significant predictor of psychological detachment (although this relationship was in the expected direction with a p value of 0.076). Thus, support was found for Hypothesis 2 but not Hypothesis 1.

With regard to Hypothesis 3, significant but differing relationships were found between the independent variable, mindfulness, and all three outcome variables. The relationship between mindfulness and need for recovery was negative and indirect, mediated by both affective rumination (coefficient = -0.17, 95% CI -0.41, -0.04) and psychological detachment (coefficient = -0.09, 95% CI -0.21 – 0.01), but not by problem solving pondering. In accordance with guidelines from Preacher, Zhang, and Zyphur (2011) these results indicate a medium to large effect size for rumination, and a medium effect size for psychological detachment. There was also a negative and indirect relationship between mindfulness and emotional exhaustion, of medium to large effect size, through affective rumination (coefficient = -0.15, 95% CI -0.33, -0.03) but no mediating role was found for psychological detachment or problem-solving pondering. Results indicated a significant direct relationship between mindfulness and sleep difficulties (coefficient = -0.37, 95% CI -0.64, -0.11) with no mediation detected. Taken together, these results provide partial support for Hypothesis 3.

Discussion

The purpose of this study was to investigate whether coaches higher in dispositional mindfulness would report higher psychological detachment from work related issues, and lower affective rumination and problem-solving pondering. Further, it was predicted that coaches higher in mindfulness would also report better recovery from work demands, as

indicated by lower scores on measures relating to insufficient recovery, and that this relationship would be explained by two of the three conceptualisations of work-related rumination. Partial support was found for these hypotheses, in that analysis showed a significant negative relationship between mindfulness and all three recovery related variables: participants higher in mindfulness reported lower emotional exhaustion, a lower need for recovery, and fewer sleep difficulties. The potential mechanisms for each outcome differed slightly. Higher mindfulness was related to lower affective rumination, which mediated the negative relationship between mindfulness need for recovery, and between mindfulness and emotional exhaustion. The relationship between mindfulness and psychological detachment was positive, though not statistically significant at the traditional level (p=0.076), but psychological detachment was a mediator in the negative relationship between mindfulness and need for recovery. Participants who scored higher on mindfulness reported fewer sleep problems, but analysis showed this to be a direct relationship with no mediation detected. While results indicate that dispositional mindfulness may help to promote or facilitate recovery, the differing results for the indirect effects of psychological detachment, affective rumination and problem-solving pondering suggest different roles for each in the recovery process. Psychological detachment implies switching off from work thoughts and events altogether, including positive as well as negative reflections on work (Kinnunen et al., 2017a). Affective rumination, by contrast, refers only to negative work-related thoughts. Someone who does not engage in affective rumination, therefore, has no *negative* and ruminative, work related thoughts, but that does not preclude their thinking about work in a positive way. It has previously been argued that total detachment is not necessary for recovery, because there may be beneficial outcomes from positive reflection on work (Binnewies, Sonnentag, & Mojza, 2009b). Results in the present study provide support for this position. Affective rumination was the most influential mediating variable in the model. Results show that the negative relationship

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between affective rumination and recovery related variables was stronger, in the sample of coaches, than the positive relationship between psychological detachment and the same recovery related variables. Problem solving pondering did not appear to have any bearing on recovery, suggesting that engaging in positive or goal directed thoughts about work does not significantly hinder the recovery process. Overall, these results suggest that affective rumination amounts to a continuation of work demands, making replenishment of resources more difficult. Positive thoughts about work, however, do not seem to involve the same perpetuation demands and it is even possible that thinking positively about work could itself be a resource-building process (Bono, Glomb, Shen, Kim, & Koch, 2013; Llorens, Schaufeli, Bakker & Salanova, 2007), as it prolongs positive states and may assist with problem solving at work.

Many coaches have high integration between their coaching work and leisure time, work non-traditional hours and need to frequently switch in and out of work mode, all of which can make psychological detachment more challenging. This may explain why the hypothesized relationship between mindfulness and psychological detachment, while positive, was non-significant in the results. It also highlights the practical importance of the findings of the present study. Instead of trying to completely switch off from work related thoughts, it may be more important and helpful for coaches to regulate thought content and limit negatively toned ruminative thoughts about work issues.

Results suggest that those coaches who are higher in dispositional mindfulness are less likely to engage in negative perseverative thought outside of work time, and that this helps them to recover from coaching-related demands and stressors. Given that mindfulness can be developed and enhanced through deliberate training (Brown & Ryan, 2003), mindfulness-based interventions could be of benefit to sport coaches (Lundqvist et al., 2018). By increasing self-awareness and compassion and reducing emotional reactivity (Escuriex & Labbé, 2011),

mindfulness training could reduce the degree to which coaches engage in ruminative thought and dwell on work related problems. In sport settings it is not always possible to eliminate potential stressors, such as athlete performance once competition is underway, umpiring or judging decisions, emotional reactions of supporters and side-line parents, and various aspects of sports administration (Kellmann et al., 2015). These stressors are a part of the job, which coaches often cannot control. With increased mindfulness, however, coaches may be better able to let go of those stressors rather than being worn down by them.

When interpreting results, consideration should be given to the recovery measures used. The 'Need for Recovery' scale measures early symptoms of fatigue at work (Van Veldhoven & Broersen, 2003) while emotional exhaustion is a dimension of burnout. The two measures are similar constructs; both are considered a pre-cursor to ill health (Sluiter, De Croon, Meijman, & Frings-Dresen, 2003) and have correlated highly in previous research (Van Veldhoven & Broersen, 2003). It is likely, however, that emotional exhaustion is a more 'serious' measure of lack of recovery, and only emerges when recovery has been insufficient over a period of time. This may mean that those in the present study those who scored highly on 'need for recovery', but not emotional exhaustion, may have been feeling fatigued and in need of some time off, but were not necessarily at risk of burnout. The coaches who reported more frequent feelings of emotional exhaustion were perhaps those who had failed to achieve the necessary recovery over a long period of time, and who were experiencing burnout symptoms. Research examining recovery processes, and onset of burnout symptoms over time, would provide a better understanding whether a growing need for recovery leads to a state of emotional exhaustion.

Limitations and future directions

The present study is limited by its cross-sectional design, meaning that inferences about causation cannot be made. While causation has not been explicitly discussed, the proposed model did suggest the theoretical direction of relationships between variables. It should be acknowledged that it is also possible that better recovery from work demands enhances one's capacity to be mindful. While the present study provides an initial step in modelling the relationships between mindfulness, work-related rumination, and recovery, longitudinal research is needed to understand the directionality of the relationships in the model more fully. This is particularly important as recovery is a process that occurs *within* individuals; therefore, future research should collect repeated measures from the same individuals over a period of time. The present research suggests that coaches who are generally more mindful also achieve better recovery from work. A repeated measure study, in contrast, would allow for investigation of whether individual coaches experience varying levels of recovery, at times when they are more or less mindful than usual.

In the present study no accounting was made for workload or work demands, which may have varied greatly between participants owing to the levels at which they were coaching, and the different sports they were involved in. The level of work demands experienced by coaches would potentially impact the degree to which recovery is required. Perceived stress was measured and controlled for, and this could potentially reflect work demands, but future research in this area should take into account the objective workload faced by coaches.

Finally, the measure used to assess mindfulness in the present study, the MAAS, measures attention and awareness only, and does not explicitly measure other facets of mindfulness such as non-judging and non-reactivity to inner experience. Brown and Ryan (2004), however, argue that without open and non-judgmental observation, mindful states as

measured by the MAAS would be uncommon. The MAAS, therefore, can still be considered to capture facets of mindfulness other than attention and awareness.

Concluding remarks

Analysis in the present study shows that coaches higher in mindfulness reported two things: (1) lower emotional exhaustion, indicating lower levels of burnout from their coaching work and (2) a lower need for recovery, or less day-to-day fatigue from coaching work, compared to coaches lower in dispositional mindfulness. The relationship between coach mindfulness and lower emotional exhaustion was mediated by lower levels of work related affective rumination, suggesting that the extent to which coaches dwell on work problems can influence the likelihood of burnout. The relationship between coach mindfulness and a lower need for recovery was also mediated by less work-related rumination, as well as higher psychological detachment. Overall, lower affective rumination was a more influential mediator variable than higher psychological detachment, suggesting it is not whether but how someone thinks about work that is more important to recovery. By highlighting these differing roles of psychological detachment, and lack of affective rumination in the work recovery process, the present study contributes to the work stress and recovery literature.

The present study also adds to the sport coach literature, by exploring mechanisms which assist in recovery and therefore help to protect coaches from the risk of burnout. Importantly, the sample includes coaches from a range of different levels across the coaching spectrum, reflecting the blended nature of the profession (Duffy, 2011). Much coaching research on stress and burnout has focused on high performance coaches only (Potts et al., 2019), but wellbeing is important for all coaches regardless of the level at which they work. Coaches who work at sub-elite level and combine their coaching work with other employment may need recovery from work demands just as much as their high-performance counterparts.

A broad range of coaches participated in the present study and therefore contributed to the research findings.

An overall and important finding of the present study is that amongst the sample of sport coaches, dispositional mindfulness does appear to have a positive relationship with recovery from work demands, meaning that mindfulness may help coaches replenish and restore those personal resources they have drawn on during the working day. A second, and equally important implication, is that emphasis need not be placed on switching off from work entirely, in order to recover work demands, but rather on strategies to limit negative ruminative thought. Higher levels of mindfulness were related to lower levels of affective rumination, and it is well established that mindfulness can be developed and enhanced through training. Findings, therefore, provide support for the use of mindfulness training as a recovery-promoting intervention for sport coaches not just at the high-performance level (e.g., Lundqvist et al., 2018), but across the coaching spectrum.

Chapter 3: Coaches, rumination and recovery: a daily diary study (Study 2)

Sport coaching is an occupation which has the potential to be rewarding and stimulating, but also one which is known for its pressures (Fletcher & Scott, 2010). Multiple studies have highlighted psychological stress as a common experience among sport coaches (e.g., Fletcher & Scott, 2010; Norris et al., 2017). Stress can be triggered by the many and varied demands that coaches face, relating not just to the technical nature of sport and coaching but also to management, administration, and organizational stressors (Norris et al., 2017). Additionally, many coaches experience role overload, either because their coaching job involves multiple tasks and responsibilities, or because coaching is an additional job on top of full-time primary employment (Capel et al., 1987).

Given the wide range and frequency of demands faced by coaches, it is not surprising that burnout has been identified as an issue and a cause for concern in the coaching profession (Kelley, 1994; McNeill et al., 2017; O'Connor & Bennie, 2006). Burnout is a state of chronic strain resulting from ongoing psychological stress (Fletcher & Scott, 2010), and is experienced amongst coaches from high performance right through to volunteer and community levels (Bentzen et al., 2016a; Engelberg-Moston, Stipis, Kippin, Spillman, & Burbidge, 2009). Coaches experiencing symptoms, even at low levels, may feel emotionally depleted with a desire to distance themselves from their athletes (Kelley, 1994). Because coach attitudes and behaviours are known to influence motivation and enjoyment levels of those they coach, burnout can negatively affect not just the coach themselves but also the athletes and sports participants they work with (Kelley et al., 1999; Wiersma & Sherman, 2005). It is important, therefore, for the wellbeing of coaches and those they coach, that more is understood about how to protect coaches from burnout.

One factor which may help coaches avoid burnout is the extent to which they can recover from the day to day demands of their coaching work, thus restoring personal resources that are used during work time (Geurts & Sonnetag, 2006). The present study examines a model of recovery, based on state mindfulness, which has implications for preventing coach burnout. The model draws on findings from Study 1 (Chapter 2) in this thesis, where dispositional mindfulness was identified as a potential facilitator of recovery. Analysis of cross-sectional data in that study showed that coaches higher in dispositional mindfulness reported lower levels of emotional exhaustion, and less need for recovery from work demands. These results formed provided preliminary support for mindfulness as an influential variable in recovery, but they were based on group level data. Because recovery is something that happens within individual people, it may be better understood by investigating within-person processes. The present allows for this sort of investigation by using a 28-day daily diary design, where individual coaches provide repeated measures of recovery related variables.

Work stress and recovery

The work stress literature indicates that in any stressful or demanding occupation, recovery from work stress is necessary if workers' performance and wellbeing are to be maintained over time (Binnewies, Sonnentag, & Mojza, 2009a; Zijlstra & Sonnentag, 2006). Two prominent theories offer complementary explanations of the recovery process (Binnewies et al., 2009a). The Effort Recovery model (ERM; Meijman & Mulder, 1998) states that in order for an individual to meet work demands, psychophysiological systems such as the sympathetic adrenal medullary system and the hypothalamic pituitary adrenal system, are activated (Sonnentag & Geurts, 2009). Such activation results in neuroendocrine and cardiovascular reactions, including elevated secretion of stress hormones, heart rate, and blood pressure (Sonnentag & Geurts, 2009), all of which place physiological strain on the body. The individual might experience this strain through feelings of increased fatigue and low mood (Fuller et al.,

2003; Sonnentag, Binnewies, & Mojza, 2008). According to ERM, once work demands cease, psychophysiological systems can deactivate and return to baseline levels, allowing strain to subside and recovery to occur (Sonnentag, 2001).

Conservation of Resources theory (COR) (Hobfoll, 1989) offers a slightly different explanation of recovery. According to COR, individuals have a number of valued personal resources which they strive to obtain, retain, and protect. When resources are threatened or lost, stress results (Sonnentag, 2001). Work effort can deplete an individual's resources (Binnewies et al., 2009a), the most relevant of which is energy (Zijlstra, Cropley, & Rydstedt, 2014), leading to feelings of stress and fatigue, and negative mood (Sonnentag & Fritz, 2007). If work resources remain depleted it is difficult for workers to meet the demands of their job (Zijlstra et al., 2014). Recovery activities, which by nature should not call on the same resources used during work time, can help to restore resources (Sonnentag, 2001; Sonnentag & Fritz, 2007). Effective recovery activities vary from person to person but may be active (e.g., exercise) or passive (e.g., relaxation); as long as they differ from worktime activity they potentially contribute to recovery. In sum, the ERM recovery model explains recovery in terms of activated psychophysiological resources having the opportunity to wind down, whereas according to COR recovery depends on restoration of depleted resources. The common ground between theories is that both assert that for recovery to occur, work-related activity needs to cease.

The effects of recovery impact both personal wellbeing and work performance. If workers are recovered sufficiently, they will likely feel mentally and physically refreshed, and ready to face future work demands. In contrast, under-recovered workers will remain fatigued (Zijlstra et al., 2014). With less available energy, under-recovered workers may have to work even harder than normal to meet work demands and carry their workload, resulting in a higher than usual level of psychophysiological activation during work and greater resource depletion

than usual. Consequently, as recovery becomes more important and necessary it is also more difficult to achieve. Insufficient recovery over an extended period is potentially damaging not just to workers' psychological wellbeing, but also to their physical health. Build-up of stress over time can result in allostatic load (McEwen & Seeman, 1999), the term given to the wear and tear on bodily systems which results from sustained neuroendocrine and cardiovascular activation. Allostatic load is thought to be the pathway between perceived stress and impaired health (Brosschot, Gerin, & Thayer, 2006; Juster, McEwen, & Lupien, 2010). Failure to achieve regular recovery over time can, therefore, place a worker at risk of physical illness on top of burnout.

It is straightforward to apply both the ERM and COR theory to work which requires physical effort and exertion (Rook & Zijlstra, 2006), because it is obvious when work ends and recovery time begins. If leisure or non-work activities do not involve the same physical demands as work activities, simply stopping work for the day can provide a recovery opportunity. But when work entails mental effort, it is more difficult to determine when or whether stressors cease to place demands on workers (Querstret, Cropley, & Fife-Schaw, 2017). Simply thinking about work can prolong the experience of work demands (Brosschot et al., 2006), making the transition from work time to recovery time unclear (Rook & Zijlstra, 2006). The impact of work-related thought outside of work time is particularly relevant to sport coaches, as coaching has been described as a profession from which it is difficult to mentally disengage because of high integration between work and non-work activities (McNeill et al., 2017). The first study in this thesis (Chapter 2) considered the utility of mindfulness in recovery, in terms of whether dispositional mindfulness helped with mental disengagement from work, or influenced the way that coaches think about work outside of work time. The present study continues that work, this time looking closely at within-person changes in state mindfulness and subsequent effects on work related thought and on recovery-related outcomes.

Mindfulness

Mindfulness is a state of consciousness involving a 'receptive attention to and awareness of present events and experience.' (Brown et al., 2007b, p. 122). Mindfulness has been proposed to bring about personal benefits, including positive emotional states, and an increased tendency to act in a self-regulated manner in alignment with personal needs, values and interests (Brown & Ryan, 2003). All individuals naturally have the capacity to experience mindfulness (Tuckey, Sonnentag, & Bryan, 2018), but some people tend to do so more than others (Dane, 2011). This natural, trait-like tendency toward mindfulness, referred to in this thesis as dispositional mindfulness, was measured and focused on in Study 1. However, an individual's level of mindfulness does always not remain constant. For one, dispositional mindfulness can be developed and enhanced through training (Eisenlohr-Moul, Peters, Pond, & DeWall, 2016). Further, regardless of one's level of dispositional mindfulness, the strength of their state of mindfulness at any given time can vary and fluctuate (Hülsheger et al., 2013; Siegel, 2009). The present study focuses on these within person fluctuations in state mindfulness, and their potential relationship with recovery from work demands. In particular, the study examines whether changes in state mindfulness predict varying levels of work-related rumination, and whether this has a subsequent effect on recovery related outcomes.

Mindfulness, rumination and recovery

Rumination, a pattern of thinking characterised by intrusive, repetitive, and usually negative thoughts, is particularly relevant to recovery (Cropley, Rydstedt, Devereux & Middleton, 2015). This is because ruminative thoughts about work challenges or difficulties can form psychological representations of either past or future stressors at work (Brosschot et al., 2006), prolonging not just the experience of work demands but also the associated stress response (Brosschot et al., 2010). For example, a study on school teachers found that those

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reporting higher rumination scores also recorded significantly greater cortisol secretion in the evening after work, compared those who reported less rumination, suggesting rumination was prolonging the physiological stress response (Cropley, Rydstedt, Devereux, and Middleton, 2015). In their laboratory-based experiment, Glynn, Christenfeld, and Gerin (2007) demonstrated that rumination about a stressful activity could prompt a physiological stress response (i.e., increased blood pressure) up to one week after the activity. Both studies provide physiological support for the claim that ruminative work-related thoughts outside of work time continue the stress response, creating a potential impediment to recovery (Sonnentag & Geurts, 2009).

Work-related thought may also impede recovery by drawing on the same mental resources that are used during work time. According to both ERM and COR, recovery can only occur if resources used during the working day are not called on during the recovery period (Sonnentag, 2001). Thinking about work during recovery time could impact the effectiveness of the recovery process (Rook & Zijlstra, 2006), while mindfulness, with its present moment focus, may help to promote recovery by minimizing work-related thought during non-work time.

Past research (including Study 1 in this thesis) has shown a negative relationship between mindfulness and rumination, in that individuals who are higher in mindfulness are less likely to engage in rumination patterns of thinking (Josefsson et al., 2017; Jury, & Jose, 2019; Querstret et al., 2017). There are several possible explanations for this relationship. Firstly, mindfulness implies acceptance of events and experiences (Brown & Ryan, 2004) whereas rumination has been described as a maladaptive cognitive strategy employed by individuals to avoid, rather than face up to, unwanted emotional states (Catalino et al., 2017; Liverant, Kamholz, Sloan, & Brown, 2011;). Rumination, therefore, indicates a lack of acceptance

(Ciesla, Reilly, Dickson, Emanuel, & Updegraff, 2012; Liverant et al., 2011 Watkins, 2004), a mental or emotional stance which seems incompatible with a state of mindfulness.

Additionally, as a cognitive response to events or experiences, rumination is automatic rather than intentional (Broderick, 2005). Mindfulness, on the other hand, is associated with decreased automaticity of thoughts and emotions (Glomb et al., 2011). Mindfulness is thought to involve a shift in perspective, referred to as decentering (Brown et al., 2007b) or re-perceiving (Shapiro et al., 2006), in which thoughts and emotions are acknowledged simply as temporary mental events rather than reflections of reality (Bishop et al., 2004; Wolkin, 2015). Decentering therefore involves a separation of self from emotion, and this is apears to reduce automatic response patterns such as rumination (Glomb, 2011). Decentering is also thought to help people separate events and experiences from evaluations of their own self-worth (Mesmer-Magnus, Manapragada, Viswesvaran, & Allen, 2017b). As it is often these evaluative, self-concerned judgments which form the basis of ruminative thought (Broderick, 2005) decentering may minimise or remove the triggers for rumination.

Mindfulness, sleep, and recovery

Improved sleep quality is another path by which mindfulness may promote recovery from work demands. Dispositional mindfulness is positively related to sleep quality (Howell, Digdon, & Buro, 2010), a relationship which was demonstrated in Study 1 of this thesis. Additionally, improved sleep has been shown to be an outcome of mindfulness-based wellbeing interventions (e.g., Caldwell, Emery, Harrison, & Greeson, 2011). The relationship between mindfulness and sleep quality has been attributed to an increased awareness of physical cues regarding the need for sleep amongst those higher in mindfulness (Howell et al., 2010). This awareness in turn prompts engagement in good sleep behaviours (Howell, Digdon, Buro, & Sheptycki, 2008). Additionally, sleep difficulties are often related to attempts to

control sleep, which can have the counterproductive effect of increasing pre-sleep anxiety and arousal (Hülsheger et al., 2015). Mindful individuals are more likely to accept they may not fall asleep straight away and to let go of any self-driven pressure to fall asleep, thus reducing anxiety and arousal and allowing sleep to occur (Hülsheger et al., 2015; Ong, Shapiro, & Manber, 2008). The acceptance component of mindfulness may partly explain the relationship between mindfulness and sleep quality.

The relationship between sleep and recovery is intuitive but also well supported by research. On a physiological level, sleep is necessary to replenish energy resources (Hülsheger et al., 2015). With regard to work-specific recovery, sleep brings total disengagement from work-related activity, thought, and effort, providing an opportunity for recovery to take place (Hülsheger et al., 2015). Sleep can, therefore, be considered a process or phase of recovery (Berset, Elfering, Lüthy, Lüthi, & Semmer, 2011; Zijlstra & Sonnentag, 2006). Lack of sleep, or impaired sleep quality, can result in continued fatigue as well as mood changes (Querstret & Cropley, 2012) and there are well established links between impaired sleep and burnout in non-clinical populations (Grossi, Perski, Osika, & Savic, 2015). Given that mindfulness is positively related to sleep quality, and sleep is so closely linked to recovery, it is important to consider the degree to which sleep quality explains the relationship between mindfulness and recovery from work stress.

The Present Research

Considering the work stress, recovery, and mindfulness literature, the present research proposes that the level of state mindfulness experienced by an individual promotes recovery, through the mechanisms of decreased rumination and improved sleep quality. A similar framework was tested, and supported empirically, in previous research (Study 1 of the present thesis). That work is extended in the present study, with a longitudinal, repeated measures

design allowing for examination of within-person relationships between recovery related variables.

In the work stress literature there is a growing body of findings on the role and importance of regular recovery from work stress, in terms of preventing burnout and maintaining workers' wellbeing and performance over time. Within the coaching literature, however, stress research has mainly focused on causes and consequences of stress (Frey, 2007; Olusoga et al., 2009; Olusoga, Butt, Maynard, & Hays, 2010; Thelwell, Weston, & Greenlees, 2010; Thelwell, Wagstaff, Rayner, Chapman, & Barker, 2017), and on coping strategies and coping effectiveness (Levy, Nicholls, Marchant, & Polman, 2009; Olusoga et al., 2010). Only recently has coach-specific research begun to consider the role of recovery in reducing the likelihood that day-to-day coaching stressors will lead to coach burnout (e.g., Bentzen, Lemyre, & Kenttä, 2017; Bentzen, Lemyre, & Kenttä, 2016b; Kellmann et al., 2016). Kellmann et al. (2016) investigated recovery imbalances in football coaches over the course of a season. Their quantitative data from six full-time professional coaches indicated that even though perceived stress did not increase through the season, scores on recovery-related wellbeing measures decreased, suggesting that without regular recovery from short-term stress coach wellbeing could decline. Bentzen et al., also taking a longitudinal approach with a group of high-performance coaches, found that recovery was negatively related to exhaustion across the course of a competitive season (Bentzen et al., 2016b), and that quality of recovery partly explained differences in burnout symptoms amongst coaches (Bentzen et al., 2017). Together, these findings show that recovery is important and beneficial. However, as yet, research has not considered the short-term processes that promote or hinder good recovery amongst coaches.

Given the potential for coaching to be stressful, and the important role that recovery appears to play in promoting wellbeing and preventing burnout during times of stress, there is a need to learn about recovery antecedents and processes for sport coaches. The present

research addresses this gap by drawing knowledge from the recovery from work literature and applying it to the context of sport coaching. Specifically, the role of mindfulness is examined in terms of promoting coaches' recovery from work stress, through the potential mediating mechanisms of reduced negative work-related ruminative thoughts, and improved sleep quality. Utilizing a month-long daily diary design, information is gained about the nature of recovery as a daily process that takes place within individuals. Daily mindfulness has previously been considered in the context of recovery, with regard to its influence on psychological detachment as well as sleep. Hülsheger et al. (2014) conducted a daily diary design over five days, and found that daily mindfulness predicted sleep, through the mediating mechanism of psychological detachment. However, in a subsequent study over 10 days and utilising a mindfulness enhancing intervention, mindfulness predicted sleep quality and quantity but had no impact on psychological detachment (Hülsheger et al., 2015). The present study takes a similar approach, measuring daily mindfulness as well as recovery-related processes and outcomes at a daily level.

In the present study, recovery is conceptualised as an internal, personal process. As such, the present research is concerned with varying states within individuals (Hamaker, 2012). The diary design, with participants providing repeated daily measures of the same variables over a period of 28 consecutive days, gives the ability to examine within-person variability (Gunthert & Wenze, 2012). The large amount of data per person captures fluctuations in variables and yields information on the temporal nature of the short-term recovery process (Binnewies & Sonnentag, 2013). The relatively long time frame means the data provides an insight into the normal daily life of participating coaches, thus increasing ecological validity (Wilhelm, Perrez, & Pawlik, 2012). Another advantage of the diary design is the frequent data collections; by asking participants to recall a short period of time, the issue of memory bias among participants is lessened (Csikszentmihalyi, 2011; Schwarz, 2012).

For most workers, the break from work in the evening and overnight provides a natural opportunity for recovery (Bennett, Bakker, & Field, 2017). Therefore, in the present study and consistent with previous research (e.g., Demerouti et al., 2009), recovery is considered to be an overnight process. As such, data is collected at daily intervals, with each daily survey potentially yielding information on recovery processes which unfolded the previous evening. Individual coaches' daily reports of their mood and energy levels are used as measures of recovery. These variables were chosen because they directly relate to recovery: under-recovery or fatigue is a psychosocial state entailing low energy levels and high irritability (Zijlstra et al., 2014), while sufficient recovery is experienced by way of feeling mentally and physically refreshed (Binnewies et al., 2009a; Sonnentag & Kruel, 2006). It would be expected that on days when someone is better recovered from work, they would report higher energy levels and a more positive mood than on days when they are under-recovered. More generally, energy and mood can both be considered indicators of wellbeing, where wellbeing is conceptualised as state of positive mood (Diener et al, 1999) and optimal functioning (Deci & Ryan, 2001).

Conceptual model and research hypotheses

Research has demonstrated that people higher in dispositional mindfulness are less likely to engage in ruminative thought, and experience fewer sleep difficulties, both of which are thought to be related to recovery from work demands. The present research is concerned with examining these relationships on a day to day basis, within individual coaches. A conceptual model is proposed whereby daily mindfulness is indirectly related to recovery indicators (mood, energy) through two potential explanatory variables; evening rumination, and evening sleep quality.
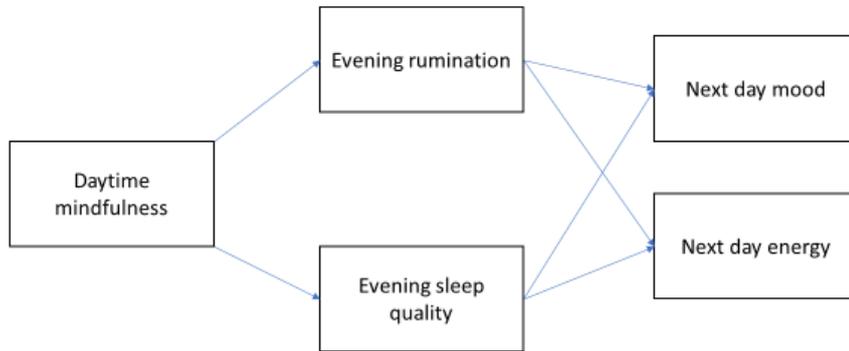
Figure 3: Conceptual model of relationships between study variables (Study 2)

Research hypotheses follow:

Hypothesis 1: At the within person level, daytime mindfulness is:

   a) negatively related to evening work-related rumination

   b) positively related to evening sleep quality

Hypothesis 2: At the within person level, daytime mindfulness is positively related to mood and energy ratings the following day, via the mechanisms of

   a) reduced evening rumination

   b) improved sleep quality

Method

Participants

Study participants were either recruited through their participation in previous coaching research, where they had expressed interest in future studies, or were recruited through their sporting organisations. Eligibility was limited to people over 18 years of age, actively working

as a sport coach (either on a full time or part time basis) and based in New Zealand. As an incentive, participants were offered the opportunity to go in a draw for a $250 shopping voucher, provided they remained in the study for the 28-day duration.

A total of 50 sport coaches began the study. Four were excluded from the analyses because they had completed less than 50% of the daily surveys, leaving a remaining sample of n = 46 (30 males, 65%). Approximately one third of participants (n = 16, 36%) were full-time coaches, and the remainder coached part-time as well as being employed elsewhere. Hours per week spent coaching ranged from 7 hours per week for a part-time coach who worked in other full-time employment, to 60 hours per week for a professional rugby coach.

Daily survey procedures

Data collection took place over a four-month period, and coaches were given the option of participating in one of four separate rounds. Each round began on the first Tuesday of the month and continued for 28 consecutive days. Coaches were asked to self-select the month in which they would complete surveys, based on availability and their sporting season. Data collection ran from August to November 2017, a time period which captured the competitive season for winter and summer sports in New Zealand. Prior to the beginning of data collection, the survey was piloted for seven days amongst a post-graduate research lab group and a small group of volunteers from a range of backgrounds and occupations. Additionally, human ethics approval was obtained from the University of Canterbury.

In the study itself, daily surveys were emailed to participants each evening for 28 consecutive days. Basic demographic information was captured in the initial survey. The remaining 27 surveys contained the same questions each day, although the order of questions was randomized to minimise habitual responding. Daily surveys were brief and took around two minutes to complete. Text introducing and concluding the survey was consistent across

participants but different every day, both to keep participants interested and engaged and to show interest and commitment on the part of the researchers. Participants were also given the option to request weekly summaries of their survey scores, to further boost engagement. All surveys and accompanying emails were friendly, relaxed and encouraging in tone, offering opportunities for participants to provide feedback or to contact the researchers with any questions or concerns. Every survey ended with an expression of thanks and appreciation to the participants for their time and effort.

Participants were asked to provide an email address for an account they could access either from home, or on their mobile device, and surveys were emailed via Qualtrics survey software at 7pm each evening. Participants were asked and encouraged to complete each survey on the night it was sent. After 15 hours the survey was made inaccessible, thus preventing late responses. Participants were strongly encouraged to complete all 28 surveys but given the feasibility of an intensive daily diary study, missing a survey on occasion would not impact their inclusion in the study. Of the 1288 possible surveys over the course of the study, 1131 were completed with a mean of 24.59 diary entries per participant.

Measures

Mindfulness.

Daily mindfulness was measured using the state version of the Mindful Attention and Awareness Scale (MAAS). This version of the MAAS has been used in similar diary research (Hülsheger et al., 2014) and is a five-item scale which is designed to measure mindfulness as a naturally occurring state, even in those without any prior mindfulness meditation training or experience. Participants were asked to think back on the day they had just had and indicate the extent to which they agreed with the scale items, an example of which is "I rushed through activities without being really attentive to them." Responses were given on a seven-point

Likert-type scale, where 1 = strongly disagree and 7 = strongly agree. Scores were reverse coded prior to analyses, so that a high score would indicate higher levels of mindfulness.

Rumination

A five-item scale was adapted from the 'affective rumination' component of the Work-Related Rumination Questionnaire (Querstret & Cropley, 2012). Items were slightly adjusted to refer specifically to coaching work with an example item being "I became tense when I thought about coaching related issued during my free time." Participants were asked to think back on the previous evening when responding, and responses where provided on a 7-point Likert-type scale where 1 = strongly disagree and 7 = strongly agree.

Sleep quality

Participants were asked to rate the overall quality of their sleep the previous evening, using a visual analogue scale with anchor points at each end (0 = extremely poor and 10 = extremely good). This single-item measure has been used in previous diary studies and correlates highly with total scores on the Pittsburgh Sleep Quality Index (Pow, King, Stephenson, & DeLongis, 2017), while the visual analogue format was used by Arnetz, Frenzel, Åkerstedt, and Lisspers (2008) in their Brief Fatigue Syndrome Scale.

Energy

Energy was measured using a single-item measure; participants were asked 'please rate your energy levels today,' again using a visual analogue scale with anchor points at each of 0 = extremely poor and 10 = extremely good (Fisher, Matthews, & Gibbons, 2016). This question was taken from the Brief Fatigue Syndrome Scale (Arnetz et al., 2008), a validated scale containing three single-item measures to measure three aspects of fatigue. The wording was slightly to reflect the daily nature of the present study and different anchor points were used to ensure consistency with the other single-item measures.

Mood

A single item measure was used for mood: participants were asked participants to 'please rate your overall mood today,' using a visual analogue scale with anchor points at each end of 0 = extremely poor and 10 = extremely good. Mood has been measured in previous recovery-related diary research using a similar single item (Fuller et al., 2003)

Reliability analysis

The reliability with which the multi-item scales used measure within-person change (Bolger & Laurenceau, 2013) was assessed following recommendations from Bolger and Laurenceau (2013). Coefficient omegas for each scale were calculated based on the estimated factor loadings and variances from the within person component of a multilevel confirmatory factor analysis (Bolger & Laurenceau, 2013). The resulting coefficient omegas of .85 for the mindfulness scale and .87 for rumination indicated good reliability.

Statistical analyses

As the daily measures were nested within participants, multilevel modelling was appropriate. All analyses were carried out using MPlus Version 8 (Muthén & Muthén, 2015).

The analyses utilised a lower level or 1-1-1 mediation model (Kenny, Korchmaros, & Bolger, 2003) reflecting the fact that all the study variables were measured at the lower (day) level. Following recommendations from Preacher and colleagues (Preacher et al., 2011; Preacher, Zyphur, & Zhang, 2010) an unconflated approach was taken, meaning that that the variance of the day-level variables was separated into within- and between-level components. This approach allows for the possibility that relationships between study variables will differ at the within- and between-levels. Additionally, each day-level predictor variable was centered on the person mean. Centering in this way makes it possible to investigate how individuals' daily deviations from their own mean on a predictor variable relate to the outcome variable

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(Hülsheger, Walkowiak, & Thommes, 2018), and enables the study of intra-individual processes.

Although measures were collected at the same time each day, they related to different points in time. On any given day, the survey measured mindfulness on that day, energy and mood on that same day, and rumination and sleep the previous evening. The area of focus, and research interest, was the temporal relationship between mindfulness on any day, rumination and sleep that same evening, and energy and mood the *following* day. Therefore, prior to analysis the mindfulness variable was lagged by one day in the dataset to allow this temporal relationship to be assessed (Bolger & Laurenceau, 2013). For example, data collected on a Tuesday evening related to mindfulness, energy, and mood on Tuesday, and rumination and sleep on Monday evening. Lagging the mindfulness variable by one day meant that the Monday mindfulness score could be used to predict Monday evening rumination and sleep, and Tuesday daytime energy and mood.

Before testing the study hypotheses, several different elements of the data were inspected. First, the intra-class correlation (ICC) was checked. This indicates the proportion of variation that exists between people, compared with the total variation in the model (Finch & Bolin, 2017). ICCs ranged from 0.32 to 0.48, indicating that a large amount of variation in the model was at the within person level, and therefore that multilevel modelling was an appropriate approach. Next, the data was visually inspected via the creation of individual panel plots for each participant. This allowed for observation of variables across time, to check for any evidence of systematic change. While none was apparent, recommendations from Bolger and Laurenceau (2013) were nonetheless followed and time was included in the final model as a predictor of the mediator and outcome variables.

Results

Tables 5 and 6 shows means, standard deviations, and intercorrelations for all study variables.

Table 5: Descriptive statistics and correlations for study variables at within person level (Study 2)

Variable	M	SD	1	2	3	4
1 Mindfulness	5.19	1.34	-			
2 Rumination	2.53	1.40	-.14*	-		
3 Sleep	6.66	2.25	.10*	-.13*	-	
4 Mood	7.57	1.60	.08	-.23*	.34*	-
5 Energy	6.91	1.98	.06	-.15*	.40*	.53*

*Significant at 0.05 level

Table 6: Descriptive statistics and correlations for study variables at between person level (Study 2)

Variable	M	SD	1	2	3	4
1 Mindfulness	5.19	1.28	-			
2 Rumination	2.53	0.94	-.82*	-		
3 Sleep	6.70	1.28	.43*	-.28	-	
4 Mood	7.62	1.16	.73*	-.69*	.56*	-
5 Energy	6.97	1.31	.62*	-.55*	.75*	.73*

*significant at 0.05 level

Tables 7 and 8 display results of the multilevel mediation analysis. At the within-subject level mindfulness was negatively related to rumination, meaning that on days where individuals reported higher mindfulness during the day, they were less likely to experience coaching-related ruminative thought that evening. Similarly, mindfulness during the day was positively related to sleep quality that evening. Thus, Hypotheses 1a and 1b were supported.

Table 7: Results of mediation analysis for outcome variable Energy

Within Level	Estimate	SE	P value	LLCI	ULCI
a_1	-0.16*	0.06	0.006	-0.25	-0.06
a_2	0.17*	0.07	0.011	0.06	0.27
b_1	-0.15*	0.04	0.001	-0.22	-0.08
b_2	0.3*	0.07	0.000	0.19	0.41
c	-0.02	0.04	0.698	-0.08	0.05
Indirect Effects					
a_1b_1	0.02*	0.01	0.030	0.00	0.04
a_2b_2	0.05*	0.02	0.044	0.01	0.09
Residual variance outcome	1.82*	0.39	0.000	1.17	2.46
Residual variance rumination	1.15*	0.13	0.000	0.94	1.36
Residual variance sleep	3.38*	0.39	0.000	2.33	4.43

Between Level	Estimate	SE	P value	LLCI	ULCI
a_1	-0.76*	0.11	0.000	-0.94	-0.59
a_2	0.49*	0.19	0.009	0.18	0.79
b_1	-0.35	0.19	0.075	-0.67	-0.03
b_2	0.61*	0.14	0.000	0.38	0.85
c	0.2	0.17	0.056	-0.08	0.49
Indirect Effects					
a_1b_1	0.26	0.15	0.070	0.02	0.50
a_2b_2	0.3*	0.14	0.030	0.07	0.53
Residual variance outcome	0.58*	0.2	0.003	0.26	0.90
Residual variance rumination	0.35*	0.06	0.000	0.24	0.45
Residual variance sleep	1.41*	0.24	0.000	1.02	1.81

*Significant at 0.05 level

Table 8: Results of mediation analysis for outcome variable mood

Within Level	Estimate	SE	P Value	LLCI	ULCI
a_1	-0.16*	0.06	0.006	-0.25	-0.06
a_2	0.17*	0.07	0.011	0.06	0.27
b_1	-0.20*	0.04	0.000	-0.27	-0.14
b_2	0.20*	0.04	0.000	0.12	0.27
c	0.02	0.05	0.747	-0.06	0.09
Indirect Effects					
$a_1 b_1$	0.03*	0.01	0.013	0.01	0.05
$a_2 b_2$	0.03*	0.02	0.030	0.01	0.06
Residual variance outcome	1.32*	0.14	0.000	1.09	1.56
Residual variance rumination	1.15*	0.13	0.000	0.94	1.34
Residual variance sleep	0.28*	0.11	0.000	2.33	4.43

Between Level	Estimate	SE	P Value	LLCI	ULCI
a_1	-0.76*	0.11	0.000	-0.94	-0.59
a_2	0.49*	0.19	0.000	0.18	0.79
b_1	-0.43*	0.21	0.035	-0.77	-0.09
b_2	0.28*	0.11	0.009	0.11	0.46
c	0.35	0.18	0.058	0.05	0.65
Indirect Effects					
$a_1 b_1$	0.33	0.17	0.055	0.05	0.61
$a_2 b_2$	0.14	0.08	0.096	0.00	0.05
Residual variance outcome	0.44*	0.11	0.000	0.26	0.61
Residual variance rumination	0.35*	0.06	0.000	0.24	0.45
Residual variance sleep	1.41*	0.24	0.000	1.02	1.81

*Significant at 0.05 level

Regarding Hypothesis 2a, results showed a significant indirect relationship between mindfulness and energy, through both rumination and sleep, supporting our predictions (Figure 1). Similarly, Hypothesis 2b was supported, with rumination and sleep both shown to be mediating variables of the indirect relationship between mindfulness and mood. Contrast tests showed that neither mediator variable was more important than the other, in terms of their explanatory roles in the model (Refer to Figure 1 for a conceptual diagram of the mediation).

Relationships at the between-subject level were not hypothesized, because the focus of the study was the within-person process of recovery. However, tests for those relationships were included in the analysis and results, displayed in Tables 7-8, show a similar pattern to results at the within-subject level. Mindfulness was related to rumination and sleep, indicating that those coaches who across the course of the study reported higher mindfulness levels also reported less rumination and better-quality sleep. Consistent with the within-person analyses, there were significant indirect effects between mindfulness and both outcome variables through rumination and sleep.

Discussion

The 28-day diary study provided a rich body of data and with it the ability to investigate within-person fluctuations in mindfulness, consequent changes in evening recovery processes, and recovery-related outcomes the day after. Results supported the study hypotheses. Firstly, as consistent with existing research (e.g., Josefsson et al., 2017; Querstret et al., 2017), a negative relationship was found between mindfulness and subsequent rumination, suggesting that the acceptance of events and experiences that characterizes mindfulness (Brown & Ryan, 2004) reduces the likelihood that coaches will engage in negative ruminative thought about work related issues. Secondly, results confirmed the hypothesis that there would be a positive relationship between daily mindfulness and sleep that same evening, providing further evidence that a mindful attitude promotes sleep quality (Howell et al., 2010). Finally, support was found for the hypothesized mediation model. Results showed an indirect relationship between coach mindfulness on a given day and mood and energy the following day, through rumination and sleep quality on the given evening. Specifically, on days where coaches reported higher mindfulness (relative to their own mean), they also reported less coaching-related rumination and better sleep quality that evening, and higher mood and energy ratings the following day.

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A strength of the present study research is the longitudinal design and daily data collection, as there is currently very little research on how mindfulness varies across workdays and how this might affect wellbeing related outcomes. Almost all investigations of mindfulness in the work context look at trait mindfulness, or the impact of mindfulness interventions (Tuckey et al., 2018). Results of the present study, which show that varying levels of mindfulness predict variation in rumination and sleep and are indirectly related to recovery, add to the literature on how, rather than whether, mindfulness is related to wellbeing. Mindfulness appears to help people regulate the content of work related thought outside of work time, reducing work-related rumination and thus allowing for more effective recovery from the mental demands of work. Through this process, mindfulness may help to protect against the risk of under-recovery and eventual burnout.

The use of within person lagged analysis gives an indication of the temporal order of the variables. It is also possible, however, that mindfulness and consequent effects on rumination and sleep, are outcomes rather than predictors of positive mood. That is, on days where people are in a better mood, they are more likely to be mindful (Suelmann, Brouwers, & Snippe, 2018), or that their mindfulness levels and mood have a mutual influence on one another (Gotink et al., 2016). There is, however, empirical support for the temporal order of mindfulness and mood put forward in the present study. Snippe, Nyklíček, Schroevers, and Bos (2015) examined within-person changes in mindfulness and mood following a Mindfulness Based Stress Reduction intervention, finding that changes in mindfulness predicted changes in positive affect the following day, but changes in affect did not predict next-day mindfulness. Mindfulness, they argued, was not simply a 'side-effect' of a good mood

Snippe et al., 2015).[1] While not yet conclusive, evidence does suggest that mindfulness promotes positive affect rather than the other way around.

Sleep is an important part of any overnight recovery process, because of the opportunity it provides for total disengagement from work related demands, as well as the replenishment of resources. The present study expected, and found, mindfulness to be positively related to sleep quality. This hypothesis was based on prior research suggesting that mindfulness promotes better awareness and regulation of sleep behaviour (Howell et al., 2008; Hülsheger et al., 2015), as well as on the findings from Study 1 in this thesis. In Study 1, sleep quality was included in the theoretical model as in indicator of recovery, and in that same study it was hypothesized that any relationship between mindfulness and sleep would be at least partially explained by rumination (i.e., lower rumination would be related to fewer sleep difficulties). Results from Study 1 showed that amongst the coach sample there was a negative relationhsip between mindfulness and sleep difficulties, but that it was direct; rumination did not play an explanatory role. Despite that result, it is still possible that improved sleep is a result of decreased rumination (Berset et al., 2011; Demsky, Fritz, Hammer, & Black, 2018), and that the two recovery processes proposed in the present study (lower rumination, higher sleep quality) are intertwined. Future research with a design that supports serial mediation causal inferences could investigate this potential relationship more fully.

Theoretical contributions

The present study contributes to the work recovery literature by identifying the state of mindfulness as a factor which might facilitate recovery, helping coaches restore personal resources so that they may continue to meet the demands of their work. The study hypotheses

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[1] Supplementary analysis tested the direct relationship between mindfulness (lagged by one day) and mood, and vice versa. The effect size for mindfulness predicting mood (0.42) was greater than mood predicting mindfulness (0.24) providing support for the suggested temporal order of variables.

drew on two complementary work stress and recovery theories: The Effort Recovery Model, and Conservation of Resources theory. Both are based on the principle that for recovery to occur, work demands must reduce or cease. Work-related thought outside of work time can act as a continuation of work demands, therefore impeding recovery. Negative rumination is considered particularly detrimental, because dwelling on work problems and stressors may prolong the physiological stress response (Brosschot et al., 2006), and prevent restoration of resources (e.g., energy, and positive affect). Contemplation of work challenges which is positive in tone, however, appears to be less detrimental to recovery (Querstret & Cropley, 2012). The experience of positive events is known to build personal resources (Fredrickson, 1998) so it is possible that reflections on good things that have taken place at work add to rather than deplete work-related resources (Bono, Glomb, Shen, Kim, & Koch, 2013). Taken together, these findings signal a need to identify factors which affect the content and valence of work-related thought and may therefore facilitate recovery. Results from the present study, particularly the negative relationship between mindfulness and rumination, suggest that mindfulness is one such factor.

Practical implications

This study applies mindfulness and work stress theory to the sport coaching context and examines overnight recovery processes. In doing so, the study adds to the literature by contributing knowledge about work recovery in a non-traditional work setting. Many coaches are motivated to work because of a genuine interest in their chosen sport, and in the development of sportspeople. They find a sense of purpose, meaning, and identity in their work (McNeill et al., 2017). This motivation, amongst workers in an occupation known for unusual work hours and high integration between work and non-work lives, means that work-related thought often extends beyond work hours. Persistent and negative thoughts about work issues are known to impede recovery from work demands. However, results of the present study

indicate that negative ruminative thought is less likely when one is in a mindful state. Given that the consistency and frequency with which individuals experience state mindfulness (Creswell, 2017) can be increased through education and training, the study highlights a potential direction for recovery promoting interventions for coaches. Such interventions may also be of valuable to other occupations where burnout is identified as a risk, and to individuals whose personal work situation may place them at risk of burnout.

Methodological considerations

Data collection took place over a relatively long timeframe, in order to gain meaningful information on the overnight recovery process within individuals. Conscious consideration was given, however, to the fact that administering daily surveys over 28 consecutive days carried the risk of participant boredom and disengagement. Accordingly, the survey was deliberately brief, capturing only the variables which were considered fundamental to the study. Future research into the relationship between daily mindfulness and overnight recovery from work could include other variables which potentially influence recovery. For example, daily measures of objective work demands might influence the amount of recovery required each evening. Daily measures of perceived work-related stress could provide some indication of the extent to which mindfulness predict more benign stress appraisals (Zimmaro et al., 2016) and more adaptive coping strategies (Weinstein et al., 2009), reducing the likelihood of ruminative thought.

In an effort to keep the daily surveys brief, single-item measures rather than multi-item scales were used to measure some of the study variables. Multi-item scales are usually considered more appropriate in survey research, as they allow for assessment of psychometric properties, but single items are suitable in some circumstances (Van Hooff, Geurts, Kompier, & Taris, 2007). In daily diary studies where constructs are measured frequently and repeatedly,

use of single-item measures can help minimise the risk of participant boredom, disengagement, and dropout (Fuchs & Diamantopoulos, 2009). Additionally, when a construct is familiar and unambiguous to a participant, the use of a single item may be appropriate and even have higher face validity than repetitive multiple items (Van Hooff et al., 2007). This was considered to be the case with the constructs of mood, energy, and sleep, which were likely to be clear and familiar to participants. Further, because the data of interest was within person fluctuations in mood and energy, rather than absolute values, it was more important to measure according to each individual's understanding of the construct, rather than considering every possible aspect (Gilbert & Kevin Kelloway, 2014). In the case of mindfulness and rumination, brief scales were considered more appropriate than single items, as the constructs are very abstract in nature and may not have been familiar to or easily conceptualised by participants.

Study variables were all measured using self-report, which does bring the risk of common method variance. However, as part of the analysis the independent and mediator variables were centered on the person mean, effectively eliminating any between-person variance attributable to the response tendencies of individual participants (Niks, De Jonge, Gevers, & Houtman, 2017). From a practical perspective, self-report is the only way to measure constructs which are attitudinal or perceptual, such as rumination, energy, and mood (Fisher et al., 2016; Schmitt, 1994). However, future research on the daily within-person recovery process could explore the use of objective and physiological measures. Steps have been taken toward development of an objective measure of mindfulness (e.g., Wong, Massar, Chee, & Lim, 2018), using breath counting exercises, and sleep quality and quantity can feasibly be measured using heart rate monitoring technology, as can physiological recovery from work demands. These measures would require considerably more time, effort and commitment from participants, and were not feasible for 28-day daily diary design of the present study. The need to make such demands should be considered carefully when data is easily accessible via self-report measures.

Conclusions

Many sport coaches are faced with high demands, making regular and sufficient recovery important for both wellbeing and performance. In showing that variations in daily mindfulness are predictive of changes in recovery related outcomes, through the mechanisms of reduced rumination and improved sleep, the present study highlights a potential path to daily recovery. Groundwork is laid for the investigation of mindfulness training as a recovery promoting intervention.

Chapter 4: A month in the life of a coach: stressors, highlights and mindfulness (Study 3)

Sport coaching has been consistently described as a stressful occupation (e.g., Frey, 2007; Kelley, 1994; Knight & Harwood, 2009; Olusoga et al., 2009), with stress potentially having negative consequences not just for the coaches themselves, but also those who they coach (Frey, 2007). Given the prevalence of stress in the profession, more understanding is needed of the personal characteristics that can influence stress experiences and appraisal. Applying the transactional theory of stress to the coaching context, Fletcher, Hanton, and Mellalieu (2006) postulate that coach stress is explained by coaches' perception, appraisal and coping processes, in relation to potential stressors in their coaching environment, and that these processes are moderated by both personal and situational characteristics. Of those characteristics, research has so far considered hardiness or mental toughness, and the availability of social support, in terms of their role in stress appraisal (Fletcher, Hanton & Mellalieu, 2006). Studies have been conducted on mindfulness based stress reduction training interventions for coaches (e.g., Longshore & Sachs, 2015; Lundqvist et al., 2018), but none have considered the role of dispositional mindfulness in terms of coaches' appraisal of potential stressors.

Despite the awareness that coaching can be a stressful and demanding profession, there is very little existing research on coach wellbeing (Norris et al., 2017). It is important to consider wellbeing independently of ill being, as psychological wellbeing is more than just the absence of stress of other negative symptoms (Huppert, 2009). Wellbeing is particularly relevant in the coaching context, as coaches are in a position where they need to give energy, encouragement and support to others. The better they are functioning themselves, the better able they will be to give to others. In the mindfulness literature there is an emerging body of

research exploring generative paths by which mindfulness promotes wellbeing (rather than via reduction of negative states) (Garland et al., 2015; Garland, Gaylord, & Fredrickson, 2011), but this has not yet extended to occupational settings nor to the sporting context.

The first two studies presented in this thesis (Chapters 2 and 3) provide evidence that sports coaches who tend to be higher in mindfulness (i.e., coaches who are more aware of and attentive to the present moment) are better able to recover from the demands of their coaching activities. The present study explores two mechanisms by which mindfulness may affect coaches' daily lives and impact their wellbeing. One mechanism is via coaches' appraisal of work demands as potentially stressful situations; the other is their tendency to notice and appreciate, or savour, positive events, and in doing so potentially build personal resources (Fredrickson, 2001). To test these mechanisms, the study analyses brief daily diary entries completed by coaches each evening over a 28-day survey period. The diary entries provide information on daily stress experiences as well as appreciation of positive experiences, both of which have been theoretically linked to mindfulness and to wellbeing outcomes (e.g., Bränström, Duncan, & Moskowitz, 2011; Kiken et al., 2017). The diary entries, therefore, have the potential to give unique insight into how mindfulness is connected to wellbeing on a day to day basis.

Stress and wellbeing

There is a long history of research on the impact of stress on psychological wellbeing. In its early years, stress research tended to focus on experiences of people's major life events which were disruptive and necessitated a period of readjustment and recalibration, such as experiencing the death of a close relative, or a divorce (Wagner, Compas, & Howell, 1988). As the literature developed research showed that, contrary to expectations, these major life events were not necessarily or consistently related to poor psychological outcomes (Bliese,

Edwards, & Sonnentag, 2017). Rather, 'daily hassles' – events or incidents that might be described as annoying, inconvenient and bothersome (Harkness & Monroe, 2016) such as being stuck in traffic or losing things - were found to be a more powerful predictor of psychological wellbeing (Kanner, Coyne, Schaefer, & Lazarus, 1981; Larsson, Berglund, & Ohlsson, 2016) than major life events. In the context of coaching it is often the daily hassles, such as issues to do with coaching administration, meeting the expectations of sponsors or parents, and the lack of good organisational management, which appear to impact the daily lives of coaches (e.g., Kelley, 1994; Knight & Harwood, 2009; Lundkvist, Gustafsson, Hjälm, & Hassmén, 2012). These stressors are in addition to tension caused by balancing coaching with other work and family commitments (Potts et al., 2019). Given the relationship between daily hassles and psychological wellbeing, it is important to understand more about why seemingly minor events are often construed as stresful.

Daily hassles might be more detrimental to psychological wellbeing than major stressors, but they are not stressful simply because they occur (Larsson et al., 2016), nor are they uniformly stressful for everyone. Different individuals have different subjective experiences of potential stressors (Segerstrom & Miller, 2004), and an event construed as stressful by one person (or coach) could be completely benign and insignificant to the next. Neither construal would be right or wrong. As Lazarus (1993b, p. 8) states "there are many realities rather than a single one" and everyone's reality depends on their interpretation of events. The transactional theory of stress (Lazarus, 1966) explains these individual differences by focusing on people's appraisal processes (i.e., their interpretation of potentially stressful experiences), and subsequent coping actions for dealing with stress.

According to the transactional theory, psychological stress is the result of an active negotiation process between an individual (e.g., a coach) and their environment (e.g., a sporting competition) in a given situation (Lazarus, 1993b). The process consists of two elements,

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labelled primary and secondary appraisal. In primary appraisal, the individual (coach) assesses whether their situation presents any immediate harm, or future threat. This could be a physical threat to themselves or others, or a threat to their goals, beliefs or values. Secondary appraisal consists of a weighing up of what could potentially be done about the situation (coping options) and of the coping resources available (Lazarus, 2006). For example, a coach might experience stress because they perceive a threat to their job (primary appraisal) if they do not alter their competitive performance and also feel they do not have the resources available (e.g., technical skills, training, talented players) to do so (secondary appraisal) (see Fletcher et al., 2006).

Despite their hierarchical labels, neither appraisal element is more important than the other. They are thought to occur concurrently, with their combined outcomes allowing the individual to ascribe overall meaning the situation at hand (Lazarus & Folkman, 1984). That is, if the perceived scale of the harm or threat outweighs the perceived resources available, perceptions of stress will result. A perceived inability to deal with threats (stress), leads not only to feelings of psychological stress (Lazarus & Folkman, 1984) but also a physiological response. Stress perceptions trigger activation of the sympathetic nervous systems, often termed the 'fight or flight' response because the body is ready for action. At the same time there is reduced activity in the parasympathetic nervous system, limiting the ability of the body to return to a place of balance (Kemeny, 2003). While this response can be adaptive in the short term, repeated stress or a failure to adequately wind down following the stressor can lead to wear and tear (termed allostatic load) over time, and ultimately to negative physical health outcomes (McEwen, 1998). This is a risk for coaches who consistently face a large volume of stressors. Even if those stressors are minor their physical effects can accumulate, particularly if there is limited opportunity for recovery, and this can be harmful to health and wellbeing.

The extent to which an individual/coach is affected by stress can be influenced by the way in which they cope. Coping is a process where cognitive and behavioural efforts are made

to manage the demands of the stressful situation (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Thus, effective coping can alter the circumstances which gave rise to feelings of stress. Coping efforts are followed by reappraisal, potentially resulting in a reduced stress perception and response (Lazarus & Folkman, 1984). Reappraisal can also in itself be a form of coping. A particularly effective form of emotion-focused coping is positive reappraisal, meaning the reframing of an event initially perceived as stressful to see it in a benign or even a positive light (Folkman & Moskowitz, 2000). Positive reappraisal can attenuate the stress reaction and is even thought to help individuals find meaning in or growth from potentially difficult circumstances, without changing anything about the objective situation (Garland, Gaylord, & Park, 2009). Coping efforts, be they cognitive or behavioural, can be very effective in reducing initial perceptions of stress as well as associated discomfort.

Primary and secondary appraisal, coping efforts, and subsequent reappraisal may be seen as interdependent components of an overall stress process. Various individual factors affect the outcome of this process, (Folkman, Lazarus, Gruen, & DeLongis, 1986), explaining why some people are less likely than others to consider daily hassles to be stressful, or seem better able than others to handle stressful events (Almeida, 2005). For example, different people naturally have different goals, values, commitments and priorities from one another, meaning the same situation can be appraised quite differently by different people. Additionally, people have characteristic ways of appraising and coping which go beyond specific situations and which can be attributed to aspects of their character or disposition (Folkman, Lazarus, Gruen, et al., 1986). For example, personality traits such as optimism and pessimism have been shown to influence the stress and coping processes (Lazarus, 1993a). Mindfulness also appears to impact these processes. Researchers have found that people who re higher in mindfulness have a tendency to appraise daily experiences as less stressful (Finkelstein-Fox, Park, & Riley, 2018; Marks, Sobanski, & Hine, 2010; Weinstein et al., 2009). Further, higher mindfulness

predicts engagement in more effective coping strategies (Greeson, 2009). Before potential reasons for these relationships are presented, an overview of mindfulness is necessary.

Mindfulness

Mindfulness is a form of awareness (Shapiro, Siegel, & Neff, 2018) which involves paying attention to present moments and experience (Brown & Ryan, 2003) with an attitude of acceptance (Bishop et al., 2004; Brown & Ryan, 2004). Acceptance in this context means actively engaging with emotionally negative situations but in a non-judgmental way (Shallcross, Troy, Boland, & Mauss, 2010), an attitude thought to bring about receptivity and equanimity (Lindsay, Young, Smyth, Brown, & Creswell, 2018) rather than reactivity and judgment. Acceptance, therefore, may lessen the negative emotional reactivity to negative situations (Paul, Stanton, Greeson, Smoski, & Wang, 2012), reducing the degree to which they are considered harmful or threatening in primary appraisal.

Additionally, primary appraisal is potentially influenced by the metacognitive process of decentering, thought to be a key mechanism in the relationship between mindfulness and positive psychological outcomes (Shapiro et al., 2006). Decentering involves a separation of cognitions from consciousness, meaning that individuals can observe and acknowledge thoughts, feelings and emotions as cognitive processes, rather than as fact or reality. This separation of consciousness and cognition allows for a more objective assessment of events, because assessment is based on present moment observation, rather than on beliefs, memories, past evaluations, or other biases (Weinstein et al., 2009). Further, decentering is related to less self-referential processing, in that individuals in a state of mindfulness are thought better able to observe events in an objective manner. They are less likely to make subjective assessments of events or assume that those events have personal meaning and impact (Good et al., 2016). This reduces the likelihood that, in primary appraisal, events will be seen to threaten personal

goals or commitments (Good et al., 2016). Thus, the chances of primary appraisal resulting in perceptions of threat, and of the whole appraisal process resulting in feelings of stress, are lowered.

Overall, mindfulness is thought to improve the objectivity of primary appraisal (Weinstein et al., 2009), which then impacts secondary appraisal. If an individual can make a realistic and objective assessment of the size or scale of the threat they face, they will be better able to assess whether and how they can deal with that threat (Garland, 2007). Additionally, the open mind and broadened awareness that comes with mindfulness is likely to mean consideration of a wider range of potential coping options as well as greater awareness and accurate perception of coping resources (Greeson, 2009). Assessment of potential coping resources is one part of secondary appraisal. However, it is also important that an individual feels they can utilise those resources. Mindfulness has been shown to predict coping self-efficacy (Luberto, Cotton, McLeish, Mingione, & O'Bryan, 2014) meaning that people higher in mindfulness are likely to have confidence they can carry out specific coping behaviours (Luberto et al., 2014). Additionally, mindfulness is thought to promote self-determined action, (Brown et al., 2007b), as well as to be linked to feelings of autonomy and self-control (Brown & Ryan, 2003; Masicampo & Baumeister, 2007). This confidence or sense of self-efficacy is likely to feed into the appraisal process, reducing stress perceptions (Finkelstein-Fox et al., 2018). Combined, these findings suggest a more mindful individual may feel better able to use available resources and take successful coping action.

However, no matter how objective and unbiased the appraisal process, or how high the coping self-efficacy, some situations will present demands which outweigh potential coping resources and this may result in stress. How people cope with stressors can influence the severity and duration of their stress experience (Lazarus & Folkman, 1984). Mindfulness has been associated with more adaptive coping in general, because an attitude of acceptance

increases willingness to face up to and engage with negative, uncomfortable or adverse situations (Weinstein et al., 2009). With regard to specific coping techniques, mindfulness is thought to facilitate positive reappraisal (Garland et al., 2009; Hanley & Garland, 2014). Here, decentering again appears to be an important mechanism, allowing an individual to mentally step back and reconsider their circumstances, and to respond to the specific situation at hand in a deliberate and thoughtful way (c.f. self-determination, Brown & Ryan, 2003) rather than responding automatically or out of habit (Brown & Ryan, 2004). They may take into account contextual information not considered in the initial appraisal process. Additionally, they may be better able to view the stressor as impermanent, or to see their initial reaction to the stressor simply as a thought, rather than truth or fact (Fresco et al., 2007). Decentering, therefore, may enable a more complete understanding of the stressor or situation, meaning it can be reinterpreted in a positive or at least meaningful way (Hanley & Garland, 2014). This reinterpretation could in turn reduce the associated discomfort initially triggered by the situation.

Overall, mindfulness is thought to reduce the likelihood of potentially stressful situations being appraised as such. This could be through reduced perception of threat or harm in primary appraisal, or could be through increased perception of coping options, resources, and ability, or it could be a combination of all these factors. Sometimes, though, demands will outweigh resources no matter the mindfulness levels. When this happens, and stress results, those with higher mindfulness are more likely to engage in positive coping and reappraisal, reducing the negative consequences of the stressful experience.

It is clear that mindfulness can help to reduce negative states or emotions (e.g., stress, anxiety), and there is also an established relationship between mindfulness and psychological wellbeing (Bränström et al., 2011; Brown & Ryan, 2003). However, these relationships do not necessarily go hand in hand, as it not the case that positive psychological states automatically

occur when a negative state is reduced (Garland et al., 2015). For example, just because someone is not stressed, they are not necessarily doing well. Therefore, the stress-reducing effect of mindfulness is not enough to explain its positive impact on wellbeing (Zimmaro et al., 2016). It is plausible that there is a parallel positive pathway which explains how mindfulness helps healthy people maintain and enhance their psychological wellbeing. The recently developed model, 'Mindfulness to Meaning', addresses this explanatory gap and proposes a generative process whereby mindfulness promotes psychological wellbeing via two mechanisms; positive reappraisal, and savouring (Garland et al., 2015). As discussed earlier, positive reappraisal involves the reframing of initially negative events in more benign, neutral, or even positive terms. The other process, savouring, is defined as paying attention to and appreciating the positive events in ones' life, and in doing so potentially enhancing the experience of those events (Jose, Lim, & Bryant, 2012). Mindfulness has been positively related to savouring: an open and aware state of mind allows people to notice and pay attention events and experiences, so that they can be appreciated and savoured (Lindsay & Creswell, 2015), while the knowledge that events and experiences are passing states can cause someone to appreciate those events and experiences more fully and deliberately, because they will not be there forever (Carlson, 2015). Mindfulness, it seems, enables individuals to appreciate the world around them.

Although the Mindfulness to Meaning model aims to explain the relationship between mindfulness and wellbeing in positive terms, studies which have tested and found support for the model largely include participants in a place of deficit or experiencing some sort of crisis. For example, the model has been shown to explain increases in wellbeing amongst cancer patients (Garland, Thielking, et al., 2017), chronic pain (Garland et al., 2014) and social anxiety (Garland, Hanley, et al., 2017). In these studies, mindfulness has been found to promote positive reappraisal, which helps to create a mental space where savouring can occur. However,

savouring also takes place amongst healthy people in daily life and in the face of minor hassles rather than major stress (Bryant & Smith, 2015). Studies have not yet considered whether there is a connection between mindfulness and savouring amongst healthy people who are not experiencing adversity beyond minor day to day stressors. Such a connection would help to explain why people naturally higher in mindfulness report greater psychological wellbeing (e.g., Bränström et al., 2011; Brown & Ryan, 2003).

The connection between savouring and wellbeing is clear; savouring involves appreciation of positive events, experiences, or relationships, which in turn generally triggers positive emotions (Junça-Silva, Caetano, & Lopes, 2017). There is a large body of empirical research demonstrating the powerful and important role that positive emotions play in promoting psychological wellbeing (Fredrickson, 2001, 2013a; Fredrickson & Joiner, 2002), and Fredrickson's Broaden and Build theory (Fredrickson, 2013a, 2013b) articulates a positive, generative process. Compared to negative or neutral emotions, positive emotions lead to a wider array of thoughts and behavioural options, to increased flexibility and creativity in thinking, and to open-mindedness and receptivity to new information (Fredrickson, 2013a, 2013b). While this overall broadened mind-set is temporary, when experienced it allows individuals to acquire lasting personal resources which in turn increase the likelihood of experiencing future positive emotion. So begins an upward spiral where positive emotions ultimately promote health and wellbeing over time.

A broadened awareness, coupled with the tendency to pay attention to the present moment, may mean that mindful people are more likely to first notice and then appreciate or savour the positive aspects of day to day life (Geschwind et al., 2011; Kiken et al., 2017). As Salzberg (2011, p. 123) notes, "If we stop to notice moments of pleasure—a flower poking up through the sidewalk, a puppy experiencing snow for the first time, a child's hug—we have a

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resource for more joy." Mindful people might experience greater wellbeing simply because they benefit from more positivity in their day to day lives.

The present study

The present study collected brief online diary entries recorded by 46 coaches over a 28-day period. Each evening, coaches were asked to provide information on two aspects of their day: (1) whether anything *stressful* had happened in their day and what that source of stress was, and (2) the 'highlight' of their day. They also completed a 5-item state mindfulness scale, relating to that day. This data collection process resulted in a body of qualitative data on the stressful and positive aspects of coaches' day to day lives, coupled with quantitative data capturing their daily mindfulness levels. Using this data, it was possible to look for evidence of two specific mechanisms, each related to mindfulness, through which coaches may be better off in their daily life: 1) reduced stress appraisal, and 2) increased awareness and appreciation of positive events. Finding evidence of these mechanisms would allow for a better understanding of the ways that coaches might benefit, on a day to day basis, from mindfulness.

Given that the present research is exploratory in nature, it was more suitable to develop research objectives rather than test specific hypotheses. The research focuses on investigating relationships between:

1. Coaches' average mindfulness levels across the course of the month, and the likelihood of their recording daily stressors;

2. Fluctuations in individual coaches' daily mindfulness levels and likelihood of their recording a stressful event each day;

3. Coaches' mean mindfulness levels, and the typical content of their daily highlights (positive events) across the month; and

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4. Individual coaches' daily mindfulness scores and a) the likelihood of their recording a highlight (positive event) and b) the content of their recorded highlights (positive events).

Method

Data were collected alongside the quantitative diary data reported in Study 2 (refer to chapter 3 for full data collection details). Study participants were people who over 18 years of age, actively working as a sport coach, and based in New Zealand. As an incentive, participants were offered the opportunity to go in a draw for a $250 shopping voucher, provided they remained in the study for the 28-day duration. 50 sport coaches began but four were excluded from the final analyses as they had completed an insufficient number of diary entries. This left a sample of n = 46 (30 males), sufficient for the planned analysis technique of multilevel logistic regression (Maas & Hox, 2004). Approximately one third of participants (n = 16) were full-time coaches; the others had additional sources of employment. Of the 1288 possible surveys over the course of the study, 1131 were completed with a mean of 24.59 diary entries per participant.

The first part of each evening survey was the state version of the Mindful Attention and Awareness Scale (MAAS). This brief five-item scale measures mindfulness as a naturally occurring state and has been used in similar diary research (Hülsheger et al., 2014). Participants were asked to think back on their day and indicate the extent to which they agreed with the scale items, an example of which is 'I rushed through activities without being really attentive to them.' Responses were given on a seven-point Likert-type scale, where 1 = strongly disagree and 7 = strongly agree. Scores were reverse coded prior to analyses, so that a high score would

indicate more mindfulness. The scale had a coefficient omega of .85, indicating good reliability for measurement of within person change. (Bolger & Laurenceau, 2013).

Following the MAAS, coaches completed questions about rumination, energy and mood (analysed in Study 2) before moving on to two open ended questions. These were "Did anything particularly stressful happen today (add details if you feel comfortable doing so)" and "what was the highlight of today?" There was no prompt if these sections remained uncompleted, meaning participants had the option of leaving a blank space. Once the entry for the day was complete and submitted it was no longer accessible to participants, meaning they had no opportunity to review or change their diary entries during the study.

On completion of data collection, the diary entries were downloaded from Qualtrics Survey Software to a Microsoft Excel spreadsheet and prepared for analysis. Steps were followed in accordance with recommendations for an integrated generalisation design (Srnka & Koeszegi, 2007), the goal being systematic translation of the qualitative data into nominal form so that statistical analysis could be completed.

As the data was already in electronic format no transcription was necessary, so the first step was to determine suitable units for analysis. Each daily entry was brief, ranging from a single word to no more than two or three sentences, and tended to relate to a single event or topic. Therefore, individual diary entries were considered suitable units of analysis and no further unitisation of the data was needed (Srnka & Koeszegi, 2007).

The next step was development of a category scheme, relevant to the research questions and hypotheses, so that data could be categorised. An inductive-deductive approach was used, in that the category scheme was based partly on the data itself and partly on existing theoretical frameworks. First, all the diary entries were read in entirety, to ensure that the initial category scheme would be informed by all data. Next, draft categories and descriptions were developed.

For the 'stress' dataset, the first and obvious category was for 'no stress.' This category was used if a participant had explicitly said there was no stress, or if they had completed the survey for a day but left the stress question blank. Where stress was present, categories were based around 'daily hassles,' labelled 'minor stress,' and more serious stressors, labelled 'moderate/major stress.' The description for this category was informed by the taxonomy presented in Segerstrom and Miller (2004), which includes considerations of the acuteness and duration of the stressor.

For the 'highlights' data a wider range of categories was necessary, given the research focus on content as well as frequency of diary entries. As might be expected in a sample of sport coaches, a large portion of highlights were related to sport, and in particular to sporting achievements experienced either as a coach or as a player. Other highlights related to passing experiences, interactions, or moments during the day, while some were to do with special occasions such as celebrations. Reflecting this range of content, broad categories were developed before being broken down into more specific subcategories.

The first category was labelled 'achievement,' and further reduced into 'performance' and 'mastery' categories. These categories and their associated descriptions were informed by Achievement Goal Theory (Dweck, 1986), initially developed in education research but also used widely within the field of sport psychology. The second broad category was labelled 'appreciation.' Based on Adler and Fagley (2005), appreciation refers to someone being attuned to and seeing the positive aspect of their surroundings, as well as valuing people and relationships. Within the broad heading of 'appreciation' sub-categories were created based on the content of the data, as well as the research aim of exploring whether varying levels of mindfulness were related to different types of highlights. These subcategories related to nature, people, physical activity, culture/entertainment, everyday activities, and special occasions. Finally, there was a separate category for 'no highlight,' to be used either if someone had

explicitly stated that there was no highlight, or if they had completed the survey but left that question blank.

Following development of the category scheme, pilot coding was completed on a subset of data (10% of the full dataset). This was completed by the first author and a colleague (a Post-Doctoral Research Fellow, with good background knowledge of the research). Each diary entry was assessed against the relevant categories, with a code of '1' being allocated if the data met the category description' and '0' if it did not (Refer to Table 9 for category scheme and examples, and to appendix for full coding dictionary). The codes were not mutually exclusive, in that one diary entry could be coded for multiple categories, depending on its content. If the survey had been completed for a day, but no stressor and/or highlight recorded, the 'no stress' or 'no highlight' code would be used allocated as appropriate. On comparison of pilot coding results, it was agreed that no changes were needed to the category scheme itself, but more instruction and detail was needed in some of the category descriptions. Changes and updates were made accordingly and tested via recoding of the pilot data set.

On completion of pilot coding a third coder (a second year MSc Applied Psychology student with a good understanding of the study variables) was invited to join the project. The third coder was provided with background on the study, coding training, and a coding practice session. The practice session utilised the pilot coding data, to check for consistency with the other two coders. Once all three coders had expressed confidence in the category scheme, category descriptions, and coding instructions, each independently coded the full dataset.

The initial check for inter-rater reliability used was the percentage of agreement between the coders, calculated by adding the number of cases receiving agreement between each pair of coders, and dividing by the total number of cases rated (Stemler, 2004). Percentage agreement appeared high, ranging from 83% to 98% for the various categories. However, this

Table 9: Stress/highlight category titles, descriptions, and examples from data

Category	Brief Description	Example from Data
Performance	Highlight relates to achievement (on part of self or a coached athlete)	"We beat [team name] today in our game, it was the 1st time we have beaten them in 8yrs"
Mastery	Highlight relates to one's own learning, gaining understanding, development, growth	"We had a football committee meeting after coaching. We spoke about the basic issues and then ended up in quite an inspiring conversation (for me) about the potential future of the club and things we could change and do to help develop it."
People	Highlight relates to people. Appreciation of family, friends, relationships.	"Seeing my boys arrive at work and run up to me and give me cuddle, when I was coaching in the afternoon"
Nature	Highlight indicates appreciation of nature E.g., scenery, weather, animals, and sensation of being outdoors.	"Coach on Lake Rotorua and the beautiful scenery and calm water."
Culture/Entertainment	Highlight relates to culture and entertainment. Can include watching sport.	"Examining lovely ancient objects at museum."
Activity	Highlight relates to the participant being active. Includes exercise, the activity of playing sport	"Getting a run in at lunchtime following the team's morning training session."
Everyday activity	Highlight relates to a regular/everyday/non-significant activity or event	"Getting the veges at the market this morning"
Special Occasion	Highlight relates to a special occasion that doesn't happen every day	"Glass of champagne with two friends this afternoon"
No Highlight	Has completed survey for the day, but either explicitly said there was no highlight, or has left question blank.	"Hasn't happened yet"

Stress Minor	Minor issue, subjectively stressful to individual, may result in strain, but not major/objectively stressful. Resolvable within a day, or consequences do not extend beyond the day. Consequences confined to the coach, not to other people.	"Last minute change of plans to the work day that made my morning rushed"
Stress moderate/major	Moderate/major stressor; would appear objectively stressful to outside observer. Has consequences beyond the day. Has consequences which negatively impact other people.	"Yes run a tournament for work that was outdoors and I was weather effected and had to be moved indoors 250 people major stress"
No stress	Has completed survey for today, but either explicitly said no stress, or left question blank.	"Nothing especially stressful today"

calculation does not take into account agreement that occurs by chance; that is the agreement between coders which would occur if each randomly applied codes to the data (Viera & Garrett, 2005). To gain a more accurate perspective of interrater reliability, Cohen's Kappa was calculated for each possible pair of coders. The following equation was used:

$$\kappa = \frac{p_o - p_e}{1 - p_e} = 1 - \frac{1 - p_o}{1 - p_e},$$

Where P_0, is the observed proportional agreement amongst raters (i.e., how many of the total items were rated in the same way by both coders) and P_e is the hypothetical probability that both raters would randomly agree ("Cohen's Kappa Statistic," 2014) .

Cohen's Kappa ranged from .44 (for the 'everyday activity' code) to .94 (for the 'no stress' code). According to commonly used interpretation convention, .41 to .60 constitutes moderate agreement, .61 to .80 is substantial and 0.81 is near perfect (McHugh, 2012). There was, therefore, room for improvement in interrater reliability for some of the categories. Given

this, coders returned to the category scheme/category descriptions and instructions and made revisions to those with low reliability. A second round of coding was completed using the updated category descriptions, yielding a higher level of agreement between coders. The purpose of this process was not to achieve 100% agreement, as that would be very unlikely given the size of the dataset and the large number of categories, but rather to be assured that coders were coding the data in a consistent manner with one another.

To reach 100% agreement (necessary for statistical analysis to take place), all three coders met and discussed the remaining disagreements, referring to the category scheme instructions and discussing context where necessary. Once agreement was reached, the entire dataset was in nominal form and ready for analysis.

Table 10: Total times each stress/highlight category reported; number/percentage of coaches reporting each category at least once

Outcome variable	Total reports	No. coach reports	% coach reports
Performance	239	44	96
Mastery	113	37	80
People	297	44	96
Nature	85	24	52
Culture/Entertainment	36	21	46
Physical activity	125	31	67
Everyday activity	263	43	93
Special occasion	97	37	80
No highlight	201	28	61
Stress minor	321	43	93
Stress moderate/major	43	18	39
No stress	762	46	100

Table 10 indicates the number of times each category was recorded across the course of the study, as well as the number of coaches who reported that category at least once. It is worth noting that a large proportion of the 'performance' highlights related to sporting achievement, either on the part of coaches themselves, or the athletes and sportspeople they coached. Similarly, many of the 'entertainment' highlights related to sport spectating.

Statistical analyses

First, frequency scores were calculated for the different stress and highlight categories. Not all participants completed the same number of daily surveys across the course of the study, so it did not make sense to compare absolute values when looking at frequencies. Therefore, for each participant, their total frequency score for each category was divided by the total number of surveys they had completed, resulting in a proportional score for each category (i.e., indicating on what proportion of days they had recoded each highlight category). Each participant's mean mindfulness score was calculated, and bivariate correlation analysis was run for the different variables. Results are displayed in Table 11. The mean score for the highlight categories relates to mean proportionate scores.

Next, MPlus Version 8 was used to carry out multilevel logistic regression. Before running the analysis, some preparatory steps were necessary. First, the between-person predictor variables (Level 2) were created by calculating each participant's mean mindfulness score across the month. To aid interpretation, those scores were centered on the grand mean.

Table 11: Descriptive statistics and correlations for study variables (Study 3)

	Variable	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12
1	Mindfulness	5.17 (1.00)	-											
2	Performance	0.21 (0.15)	-.15	-										
3	Mastery	0.10 (0.12)	.07	.19	-									
4	People	0.26 (0.21)	.06	-.09	.01	-								
5	Nature	0.07 (0.11)	.10	-.05	-.09	.36*	-							
6	Culture/Ent	0.03 (0.05)	.33*	.08	.42*	.06	-.09	-						
7	Physical activity	0.11 (0.12)	.00	-.25	-.06	.36*	.32*	.04	-					
8	Everyday activity	0.23 (0.13)	.19	.01	-.01	.18	.32*	-.02	.25	-				
9	Special Occasion	0.09 (0.07)	-.09	-.10	-.15	.03	.30*	-.05	.37*	.31*	-			
10	No highlight	0.17 (0.24)	-.07	-.26	-.31*	-.45*	-.28	.32*	-.40*	-.46*	-.29*	-		
11	Stress minor	0.28 (0.20)	-.20	.21	.14	.32*	.03	-.02	.08	.21	-.08	-.16	-	
12	Stress mod/maj	0.04 (0.06)	-.31*	.31*	.00	-.04	-.10	-.06	-.12	-.02	-.10	.09	.05	-
13	No stress	0.66 (0.22)	.42*	-.14	-.04	-.16	.05	.09	.05	.00	.23	.19	-.74*	-.17

*significant at 0.05 level

Next, within-person variables (Level 1) were created by centering participant's daily mindfulness scores on their individual (person) mean mindfulness score. This centering enabled separation and then estimation of the within and between person variance (Pindek, Arvan, & Spector, 2018).

Second, the intraclass correlation (ICC) was calculated for the outcome variables, to determine the amount of between-person variation as a proportion of total variation. (Sommet & Morselli, 2017). An ICC of zero would mean that daily outcomes did not depend on the coach who recorded them, while anything greater than zero would indicate that at least some of the variation in outcomes depended on differences between coaches. ICC scores ranged from 0.05 (Special occasion) to 0.66 (no highlight), confirming that some of the variation in daily outcomes did depend on the coaches. A multilevel modelling approach was therefore considered appropriate. Multilevel logistic regression analysis was used to estimate the odds of a binary outcome while taking into account the dependency of the data (in this case the daily data was nested within individual coaches). A lower level model was used, meaning that the odds of different outcomes were estimated as a function of the lower level variable, daily mindfulness scores (Sommet & Morselli, 2017)

Results

Results of the twelve separate analyses (one analysis for each outcome variable, with day level mindfulness as the predictor), are displayed in Table 12. The model also calculated the effect of Level 2 variables on the different outcome variable (the between-person effect) and results for the separate between-person analyses are displayed in Table 13.

Table 12: Result of multilevel logistic regression with daily mindfulness as the predictor for each outcome variable (within-person level)

Outcome variable	Estimate	SE	Odds	CILL	CIUL	*p*
Performance	0.15	0.08	1.16	1.01	1.32	0.077
Mastery	0.12	0.10	1.13	0.96	1.33	0.209
People	0.00	0.08	1.00	0.87	1.15	0.968
Nature	-0.25	0.14	0.78	0.62	0.98	0.073
Culture/Entertainment	0.31	0.18	1.36	1.01	1.83	0.091
Physical activity	-0.04	0.12	0.96	0.78	1.16	0.709
Everyday activity	-0.04	0.07	0.96	0.86	1.07	0.530
Special occasion	0.09	0.12	1.01	0.09	1.33	0.443
No highlight	-0.09	0.09	0.91	0.79	1.06	0.312
Stress minor	-0.14	0.08	0.78	0.68	0.90	0.004
Stress moderate/major	-0.76	0.21	0.47	0.29	2.18	0.000
No stress	0.41	0.09	1.50	1.31	1.73	0.000

Table 13: Results of multilevel logistic regression analyses with mindfulness as predictor for each outcome variable (between person-level)

Outcome variable	Estimate	SE	CILL	CIUL	*p*
Performance	-0.22	0.16	-0.47	0.04	0.170
Mastery	-0.02	0.17	-0.30	0.26	0.911
People	0.07	0.26	-0.36	0.50	0.793
Nature	0.04	0.29	-0.44	0.51	0.901
Culture/Entertainment	0.64	0.28	0.19	1.10	0.020
Physical activity	-0.08	0.22	-0.43	0.28	0.719
Everyday activity	0.14	0.11	-0.05	0.32	0.220
Special occasion	-0.12	0.12	-0.31	0.07	0.306
No highlight	-0.48	0.37	-1.09	0.13	0.198
Stress minor	-0.33	0.16	-0.58	-0.07	0.038
Stress moderate/major	-0.70	0.23	-1.08	-0.32	0.002
No stress	0.43	0.15	0.18	0.68	0.005

At the within-person level, daily state mindfulness scores were positively related to culture/entertainment, as well as to the 'performance' category. This means on days where coaches recorded greater mindfulness (relative to their individual mean), they were more likely to record highlights related to performance, and to culture/entertainment. Interestingly, results also showed a negative relationship between daily mindfulness and nature-related highlights, indicating that coaches were less likely to record nature related highlights on those days where they were more mindful. For the stress data, daily state mindfulness scores were positively related to 'no stress' (OR > 1) and negatively related to both stress categories (OR < 1), indicating that on days where coaches recorded higher mindfulness (they were less likely to record any stressful events, and more likely to record no stress (or leave the answer space blank).

At the between-person level there was only one significant relationship in the highlights data, between mindfulness and the 'culture/entertainment' category. The relationship was positive, meaning that coaches who were on average higher in mindfulness more likely to report culture/entertainment related highlights, compared with coaches with lower mindfulness scores. In the stress data, mindfulness was significantly related to all three stress categories, showing that more mindful coaches were more likely to record no stress, and less likely to record either category of daily stressor, compared with coaches with lower mindfulness scores.

Discussion

The aim of the present study was to test for two separate mechanisms - fewer stress appraisals, and an increased awareness and appreciation of positive events - through which mindfulness might affect the wellbeing of sport coaches on a day to day basis. This was done by analysing data provided by a sample of 46 sport coaches, who completed brief daily diary entries each evening over a period of 28 consecutive days. Coaches recorded any stressors that

had occurred during their day, as well as noting what they considered the highlight of each day. This qualitative data was coded into nominal form using a rigorously developed category scheme, allowing for statistical analysis to take place.

Stressors recorded by coaches in their daily diaries were analysed in relation to mindfulness levels. Over the course of the month, coaches who were generally higher in mindfulness were less likely to record daily stressors. This is consistent with previous research findings, where dispositional mindfulness has been found to predict lower levels of perceived stress (e.g., Bao, Xue, & Kong, 2015; Bränström et al., 2011; Brown & Ryan, 2003). But relationships between variables aggregated across subjects are not always the same as when tracked over time within individual people (Sheldon, Ryan, & Reis, 1996), and as the aim of the study was to explore the effects of fluctuations in daily state mindfulness, results of within-person analysis are arguably more important than between-person results (Pindek et al., 2018).

At the daily level, in the present study, fluctuations in coaches' mindfulness impacted the likelihood of their perceiving events as stressful. On days when coaches recorded higher mindfulness than their own mean, they were less likely to record stressful events, regardless of their general mindfulness levels. Results concur with those of Weinstein et al. (2009) where, over a 7-day period, college students were less likely to appraise events as stressful when their state mindfulness levels were higher. The present study builds on this earlier work, extending the study timeframe and drawing on an occupational rather than student sample. Altogether, these results indicate that daily as well as general mindfulness levels can influence stress appraisals and perceived stress. No matter how mindful one usually is, being more or less mindful at any given time may influence the way that potentially stressful events are appraised at that time.

Analysis of the highlights data was aimed at exploring relationships between mindfulness and the content of coaches' daily highlights, as well as determining whether coaches were more or less likely to record highlights at all depending on daily mindfulness levels. Results indicated that coaches who were generally more mindful were more likely to note events related to culture/entertainment as highlights of their day, but there were no relationships between mindfulness and other highlight categories. Coaches' daily mindfulness levels were not related to their likelihood to record a highlight or not, but daily mindfulness was related to two of the highlight categories. On days where coaches reported higher mindfulness than their mean level, they were more likely to record achievements (their own or those of others), as well as events involving culture or entertainment, as highlights. These results provide some evidence of a relationship between mindfulness and a tendency to notice and appreciate positive events in day to day life. Given findings in prior mindfulness research, however, it may have been reasonable to expect relationships between mindfulness and a wider range of highlights. Mindfulness has been associated with improved vigilance (MacLean et al., 2010) and increased perceptual attention in daily life (Kaplan et al., 2018) as well as with an ability to experience meaning and positive affect even when completing routine and mundane tasks (Hanley, Warner, Dehili, Canto, & Garland, 2015). These prior findings suggest that when people are more mindful, they are more likely to notice their surroundings and to find value in the little things as well as the overtly exciting or positive events. In the context of the present study, this could mean relationships between mindfulness and highlight categories such as 'nature' or 'everyday activity'. However, mindfulness was only related to the more obvious 'culture/entertainment' and 'achievement' highlight categories at the within person level, while at the between person level the only significant relationship was between mindfulness and 'culture/entertainment.' Further, there was a negative relationship between mindfulness and nature-related highlights. This runs counter to existing research; multiple

studies have demonstrated a reciprocal relationship between mindfulness and connection to nature (Schutte & Malouff, 2018).

One potential explanation for the small number of significant relationships between mindfulness and highlights lies in the data collection process. Coaches were asked to record the 'highlight;' an instruction which implied recording of one rather than multiple positive events. Focusing on one highlight may have prevented coaches from noting any number of other positive moments they had experienced during the day. For example, a coach whose team or athlete had a victory would likely record that as their highlight for the day, but that does not mean that no other positive events and experiences occurred. Additionally, the use of the word 'highlight' may be problematic. This instruction could have been interpreted as referring to something overly positive. Very positive events are in fact quite rare and can trigger lowered positivity about other good experiences (Diener, Sandvik, & Pavot, 2009). Therefore, asking coaches to think about a 'highlight' may have caused them to devalue or give less consideration to anything less than very positive experiences. A broader diary instruction, inviting recording of multiple positive events (rather than 'highlights'), could enable a fuller understanding of relationships between mindfulness and positive experiences.

Another level of detail could be obtained by capturing the quality of positive experiences. In the present study, coaches were asked what their daily highlight was but were not asked about the quality or magnitude of that highlight. Data was coded as either belonging to a category or not, but there was no way of assessing the degree of positivity associated with each highlight. It is possible, however, that mindfulness manifests in the quality, not quantity, of behaviours or experiences (Kaplan et al., 2018). For example, a coach who noted the same kind of event as a highlight on different days may have appreciated that event more or less on each occasion, depending how mindful they were at the time. This type of variation was not captured in the present study but could be a focus of future projects.

Analysis of highlights data in the present study was built around the premise that mindfulness would predict propensity to notice and appreciate positive events. Study variables were in this temporal order because in order to fully appreciate something, first one most notice and be mindfully aware of that thing (Bryant, 2003). Some researchers, however, suggest that the relationship between mindfulness and positive events may be the other way around. For example, Nezlek, Holas, Rusanowska, and Krejtz (2016) suggest that some situations, particularly situations which demand a lot of attention, may elicit mindfulness. Similarly, St-Louis, Verner-Filion, Bergeron, and Vallerand (2018) propose that engaging in activity that one is passionate about is a way of facilitating a state of mindfulness, while broaden and build theory states that positive emotions bring on a temporary state of broadened awareness (Fredrickson, 2001), possibly akin to the broadened awareness of mindfulness. Therefore, it is possible that coaches' higher mindfulness on days where they recorded achievements or entertainment as highlights reflected that those coaches where highly engaged in activities they cared about or enjoyed. These possibilities cannot be ruled out in the present study: mindfulness scores and highlights information where recorded at the same time, so in practice each could predict the other. Future research could aim to determine whether being mindful enables coaches to be highly engaged in their activities, or whether some activities seem to facilitate or elicit mindfulness amongst coaches.

Strengths and Limitations

A major strength of the present study is the high ecological validity. Coaches completed the evening surveys in their home or work environment, meaning their experiences were sampled in the context in which they naturally occurred (Shiffman, Stone, & Hufford, 2008). Coaches reflected only on the day that had just taken place, a short enough period to reduce bias or error that often associated with retrospective reporting (Ram, Brinberg, Pincus, & Conroy, 2017). These reflections were made over a period of 28 days consecutive days, a

timeframe sufficiently long to record the ups and downs of daily life and to capture events that do not necessarily occur every or even most days (Stone, Kessler, & Haythomthwatte, 1991). Combined, these design features increase the likelihood that findings are generalisable to real-world day to day processes (Shiffman et al., 2008).

Another strength is the high participation rate across the course of the study. Participant dropout is a risk in diary studies because of the level of burden on participants (Ohly, Sonnentag, Niessen, & Zapf, 2010). At 28 days the present study was relatively long (c.f. Ohly et al., 2010), and of the 50 coaches who registered interest in the study, 46 remained engaged for the four-week duration. The rate of daily survey completion was high across the course of the study, and there did not appear to be a decline in data quality over time, sometimes a risk in diary design studies (Stone et al., 1991). The good participation rate and high engagement contribute to the quality of the data, increasing the likelihood that information gathered is a good representation of events in the participants' daily lives.

The month-long daily diary design is a strength of the present study, but it also brings limitations. The daily surveys were kept very brief, in order to minimise participant burden. This limited the number of measures used and meant control variables were not included, leaving open the possibility of alternative explanations for the relationships, and lack of relationships, found in statistical analyses. But the omission of control variables is not necessarily a fault: including such variables without a strong conceptual explanation of their likely influence on the substantive variables can decrease, rather than increase, validity (Aguinis & Vandenberg, 2014). Control variables should, therefore, only be included when there is a convincing theoretical rationale (Bernerth & Agunis, 2016); a criterion which was not met in the present study. Additionally, in intra-individual analysis each person essentially acts as their own control, making it unnecessary to control for between person differences

(Terracciano, McCrae & Costa Jr, 2010). Given the intensive data collection and the within person focus of the present study, the lack of control variables is not a serious limitation.

The measure of state mindfulness used in the present study related to a whole day. This approach has been used in other studies (e.g., Brockman, Ciarrochi, Parker, & Kashdan, 2017; Snippe et al., 2015) and the state version of the MAAS has been found to reliably capture day to day changes in mindfulness. However, it is an approach which may not be fine grained enough when the research focus is on relationships between state mindfulness and momentary events during the day. In order to better explore and understand mechanisms linking mindfulness to wellbeing, future studies could use an experience sampling method (Csikszentmihalyi & Hunter, 2003) which would allow for the capture of momentary states of mindfulness at multiple times per day. Given the higher intensity of data collection, such research would likely need to take place over a shorter timeframe.

Theoretical Implications

Existing theory and research have demonstrated that higher mindfulness predicts lower stress. To explain this relationship, theoretical links have been mindfulness and the different elements of the stress process: mindfulness is thought to reduce stress perceptions resulting from primary and secondary appraisal, to predict more adaptive coping, and to facilitate positive reappraisal (Garland et al., 2011; Weinstein et al., 2009). There is agreement that mindfulness can explain differences between people, in terms of perceived stress. The present study adds to the literature, showing that varying mindfulness from day to day may explain changes in levels of perceived stress for individual people. However, it is not clear whether mindfulness is equally influential at each state in the stress process, or whether it has more impact on some phase than others. For example, mindfulness may have a greater impact on

primary than on secondary appraisal, or on coping. This is an area which could be usefully explored in future research.

The relationship between mindfulness and wellbeing is well established, but positive, generative pathways between the two are less clear. Much of the literature connects mindfulness to wellbeing via the reduction of negative states such as stress. The present study contributes to emerging theory by suggesting that there may be a positive and generative connection between mindfulness and wellbeing, via the relationship between state mindfulness and appreciation of certain types of positive experiences. Future work in this area, perhaps utilising a more involved study design to capture quality as well as quantity of daily events, could further the understanding of relationships between state mindfulness and positive everyday events. This would add to emerging research and theory on how mindfulness contributes to wellbeing amongst healthy individuals.

Practical Implications

Results of the present study suggest that varying mindfulness levels do make a difference in the daily lives of coaches. On days where coaches recorded higher mindfulness, the odds that they would record a stressful event were lower. This is important, given the large number of demands coaches face on a regular basis, many of which are not major events but rather, smaller 'hassles' which can be potentially appraised as stressful and become taxing over time (Lundkvist et al., 2014). Additionally, there is a known risk and high prevalence of (McNeill et al., 2017), and stress appraisal is predictive of burnout (Kelley, 1994). If coaches could be more mindful more often, they might appraise fewer daily demands and hassles as stressful. This, in turn, would reduce exposure to the negative consequences of stress.

Although mindfulness is a naturally occurring state of consciousness, which everyone has the capacity to experience to some degree, it can be experienced more frequently and fully

with training and practice (Kabat-Zinn, 2003). Mindfulness training for coaches could, therefore, be a promising strategy to lessen risks associated with frequent stress. This is not a new idea and at least two sport-coach specific mindfulness-based interventions have been developed, both of which were promising in terms of increased mindfulness and reduced perceived stress (Longshore & Sachs, 2015; Lundqvist et al., 2018). Those interventions were designed for and delivered to coaches working at relatively high-pressure settings (for example, Division 1 College coaches and elite Paralympic coaches), but coaches at all performance levels face potential stressors. Further, coach stress is not just related to performance situations, but can result from a wide range of day to day tasks, pressures and demands (Chroni et al., 2013). There could be value, therefore, in future research involving coach specific mindfulness-based interventions aimed at a wider range of coaches and designed to be relevant in daily life as well as in performance related situations.

Conclusion

It is well established that mindfulness predicts positive psychological outcomes. A number of cross-sectional studies have linked mindfulness to decreased stress and increased wellbeing (Brown & Ryan, 2003) and many interventions have demonstrated the effectiveness of mindfulness training for stress reduction (Chiesa & Serretti, 2009). Less is known about how mindfulness 'works' in daily life (Kaplan et al., 2018), when not delibereately cultivated. Analysis of diary data in the present study suggests that one's day to day mindfulness matters in terms of stress appraisal. No matter one's overall mindfulness tendencies, being in a more mindful state on a given day could reduce the chances of that day becoming stressful. The results of the present study have practical implications for those in occupations such as sport coaching, where any number of demands and challenges can crop up each day and potentially be a source of stress.

Whether or not mindfulness 'works' by promoting positive states, rather than simply reducing stress, was less clear in the current study, but this may reflect constraint of the data collection process rather than a lack of actual relationships. It is still worth pursing understanding of the potential positive path between mindfulness and wellbeing, with future research carefully considering how best to capture the subtleties of within person variation.

Chapter 5: General Discussion

The aim of this thesis was to investigate the ways that mindfulness might assist sport coaches in maintaining wellbeing, when facing the day to day demands of their coaching work. This was investigated through three related studies. Each was concerned with job demands and personal resources and thus connected to the underlying framework of JD-R, but the studies also drew on other related theories. Each study included a measure of mindfulness, and focused on a slightly different mechanism through which mindfulness, as a personal resource, could be related to aspects of coach wellbeing.

The first two studies in this thesis tested for relationships between mindfulness and recovery from work demands. They also explored potential mechanisms explaining those relationships. The studies drew on coaching literature for context, and this provided detail of the common demands and stressors faced by coaches. Previous research on how coaches recover from work demands, and how they might maintain wellbeing in the face of demands and stressors, is limited. For this reason, the studies in this thesis drew heavily on the on the occupational health literature, where there is a growing body of knowledge on factors that can help and hinder recovery from work demands, regardless of occupation or context. Coaching is known to be a demanding job, and burnout is not only a risk for individual coaches but also creates challenges in terms of retention and sustainability for the coaching profession (O'Connor & Bennie, 2006). However, research in the occupational health field has shown that in many cases demanding work can be sustainable, and burnout can be avoided, if workers can achieve regular and enough recovery from the pressures of their work (e.g., Sonnentag, 2001; Zijlstra & Sonnentag, 2006). Recovery allows for the personal resources which are used during the working day to be replenished and restored, so that future demands can be met. Just being physically away from work is not enough to ensure recovery. There are various other

determinants, and one which appears particularly important is the extent to which people think about work, outside of work time (Sonnentag & Bayer, 2005). It is possible, and common, to be mentally engaged in work even when work is 'over,' and this impacts the ability to wind down and recover from the working day. The coaching profession is one where it may be particularly difficult to detach from work thoughts at the end of the working day, and this has implications for coach recovery. Continued thoughts about work equate to a continuation of work demands, with no opportunity for replenishment of personal resources, making it difficult for coaches in this position to avoid stress and strain and maintain wellbeing over time.

Study One (Chapter 2) tested a model in which dispositional mindfulness was hypothesized to be a predictor of recovery related outcome variables. Three different conceptualisations of work-related thought (psychological detachment, affective rumination, and problem-solving rumination) were included in the model as potential mediator variables. Results of this cross-sectional study showed that coaches who here higher in mindfulness were lower in emotional exhaustion (a dimension of burnout) and reported a lower need for recovery from work demands. The relationships were indirect: affective rumination was an explanatory variable in the relationship between mindfulness and both outcomes, while psychological detachment partly explained the relationship between mindfulness and need for recovery. These results suggested that coaches who were higher in mindfulness experienced better recovery from work demands, partly because they were better able to mentally switch off from work, but more so because even if they were unable to completely switch off from thinking about work, they were less likely to negatively dwell on work problems and issues.

Study 2 built on the findings of Study 1, using a longitudinal diary design in order to gain a fuller understanding of the roles of mindfulness and affective rumination in recovery processes. Rather than measuring coaches' general mindfulness levels, the daily surveys captured daily states of mindfulness. The data was collected every day for a month, thus

capturing fluctuations in day to day mindfulness as well as daily variations in the other study variables. Findings indicated that higher mindfulness on a given day predicted less work-related rumination that evening, and higher scores on recovery related variables (self-rated energy and mood) the following day. In other words, on days where coaches were more mindful, therefore, they were less likely to dwell on work related problems once work was done for the day and reported higher energy and a more positive mood the following day.

Taken together, Studies 1 and 2 showed that mindfulness predicted better recovery from work demands, at both the aggregate group level (Study 1), and on day to day basis within individual coaches (Study 2). One strong reason for this, according to these studies, is that mindfulness helps to regulate the content of work-related thoughts, shown by the negative relationship between mindfulness and affective rumination. This means that work demands effectively cease, and coaches have the opportunity for replenishment of personal resources that are used up or depleted during the working day.

Achieving good recovery from work, on a regular basis, is one way that coaches might maintain and promote their wellbeing. Another factor that could help determine coaches' wellness over time is the extent to which they perceive the demands of their work as being more or less stressful. Coaches are faced with many situations on a regular basis that could be appraised as stressful. These are usually not major events and could be described as 'daily hassles,' but research has shown that it is the cumulative effect of daily hassle type stressors that can be detrimental to health (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982). To this end, Study 3 examined relationships between coaches' daily mindfulness, and their diary entries detailing any stressful experiences they had each day. Analysis showed that on the days where coaches were more mindful, they were less likely to note stressful events. Additionally, coaches who were generally more mindful across the month recorded fewer stressful events during that month. These results are consistent with previous research (e.g., Weinstein et al.,

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2009) suggesting mindfulness plays an influential role in the stress process (including appraisal, coping, and reappraisal).

The second, and exploratory, aim of Study 3 was to look for evidence of a positive path between mindfulness and wellbeing. Coaches' diary entries detailing the 'highlight' of each day across the month were first read to inform development of a category scheme, then coded according to that category scheme. The resulting nominal data was used to analyse relationships between coaches' overall and daily mindfulness levels, and the types of highlights they recorded each day. This process was driven by the idea that coaches who were more mindful might have a greater ability to find positivity and meaning in their day to day activities. Several relationships emerged from the analysis. First, coaches who were generally more mindful across the month were more likely to note events related to entertainment (including sporting and cultural events) as highlights. Similarly, on days where coaches were more mindful, they were more likely to note entertainment related activities as highlights. Additionally, on those higher mindfulness days coaches where more likely to record achievement-related highlights, and less likely to record highlights related to nature. While limited in the information they provide, these results do suggest there is promise in looking closely at relationships between mindfulness and positive events. However, an alternative and even more intensive data collection approach than that taken in Study 3 could be more appropriate.

In sum, these three studies provide evidence that coaches who are more mindful are a) less likely to perceive the day to day demands of their job as stressful, and b) better able to recover from those daily demands, both of which have important implications for coach wellbeing. The more mindful the coach, the less they may be exposed to the negative effects of stress, both physical and psychological, reducing the risk of negative health outcomes associated with stress. Additionally, mindful coaches may have better ability to refrain from

work-related rumination and to get higher quality sleep, both of which would help to replenish the resources (e.g., energy, positive mood) that they deplete during the working day, and to let their psychophysiological systems which are activated during work time return to normal levels. Together these processes reduce the likelihood of work demands causing ongoing fatigue and, eventually, burnout (Sonnentag & Fritz, 2007). Finally, when coaches are more mindful, they may be more able to notice and appreciate certain types of highlights in their day. Appreciation of positive events can be a trigger for positive emotions, an important source of personal resources (Fredrickson, 2001). Mindfulness, therefore, appears to be a key factor in helping coaches to maintain sufficient personal resources to meet the demands of their day to day work. This many help coaches avoid negative states such as stress and burnout, and to maintain higher levels of wellbeing.

The stress appraisal process, and the processes of affective rumination and, to a lesser extent, psychological detachment, have been presented in this thesis as separate potential pathways between coach mindfulness and wellbeing related outcomes. However, it is likely that stress appraisal and affective rumination are closely related, and that mindfulness affects both. For one, stress is a known antecedent to rumination (Kinnunen et al., 2017b), so it would follow that if someone's high mindfulness means they have a lower tendency to appraise experiences as stressful, they would also have less reason to ruminate. However, the relationship between mindfulness, stress appraisal, and rumination may not be as linear as that. In general, ruminative thoughts tend to be self-focused (Treynor, Gonzalez, & Nolen-Hoeksema, 2003) and while they often follow a stressful experience, ruminative thoughts typically focus as much on the cause of the experience as on the experience itself (Parmentier et al., 2019). The experience might be attributed to a perceived failure to achieve personally relevant goals (Kinnunen et al., 2017b; Martin & Tesser, 1996) or by a discrepancy between where someone is and where they would like to be in terms of characteristics, skills, or other

dimensions that are meaningful to them (Robinson & Alloy, 2003). In the coaching context, an example of a potentially stressful experience for a coach is their team or athlete losing in competition. Here, the cause of subsequent rumination might not be the loss itself but rather the coach's subjective interpretation of their own coaching ability, and their failure to be as skilled as they want to be as a coach. This could have a flow-on effect on their ability to solve future coaching related challenges or problems: rumination has been shown to occupy cognitive resources in a negative way, reducing one's ability to see alternative options or come up with new and creative ideas when facing a problem (Vahle-Hinz, Mauno, de Bloom, & Kinnunen, 2017). This could result in further perceived failures or inability to achieve goals, and therefore more cause for perceptions of stress and subsequent rumination. Thus, it is possible that stress and rumination interact and reinforce one another. A coach with a high degree of mindfulness, and therefore a decentred perspective, might be better able to view a competitive loss as a reflection of processes which can worked on and improved on (an objective interpretation), rather than a reflection of their own skill as a coach (a subjective, self-referent interpretation). They would therefore experience less negative rumination.

Theoretical and practical contributions

Studies in the thesis have drawn on the occupational health and the mindfulness literature, and in turn add to those literatures. In the occupational health field, theory and empirical evidence shows that regular recovery from work demands is important in maintaining wellbeing over time, and in avoiding negative outcomes such as strain and burnout (Demerouti et al., 2009). Because work-related thought outside of work time can cause work demands to continue beyond working hours, psychological detachment from work is considered important to recovery (Sonnentag et al., 2010). However, some researchers have questioned whether all work-related thought impacts recovery in the same way, and at least one study has shown that problem-solving pondering (positive work-related thought) is not as detrimental to recovery as

work related rumination (negative and intrusive work-related thought) (Vahle-Hinz et al., 2017). Study 1 in this thesis also considered whether the different types of work-related thought having a varying influence on recovery from work demands. The analysis in that study allowed for comparison of the effect of different types of work-related rumination on recovery related outcomes. Results showed that the negative effect of rumination on recovery-related outcomes was greater than the positive effect of psychological detachment, on those same outcomes. These results provide further support for the position that the content of work-related thought is influential in recovery processes, and that it is negatively toned thought rather than work-related thought in general, that most hinders recovery.

For some individuals, it might not be whether but *how* they think about work, outside of work time, that is most impactful in terms of their recovery from work. This is a slight shift in focus from much of the existing recovery literature, which emphasises the importance of psychological detachment in recovery processes (e.g., Sonnentag & Bayer, 2005; Sonnentag et al., 2010; Sonnentag & Fritz, 2015). It is an important shift, however, because for some individuals and occupational groups it may not be easy, possible, or even desirable to completely switch off, mentally, from work related thought. This could be the case where there are less defined boundaries between work and non-work roles, or where work and leisure activities are highly intertwined. For those people, recovery efforts may be better focused at avoiding negative, ruminative thoughts about work than avoiding work related thought entirely. Given the known negative relationship between mindfulness and negative rumination, well established in the mindfulness literature (e.g., Coffey & Hartman, 2008; Coffey, Hartman, & Fredrickson, 2010) and further evidenced in Studies 1 and 2 in this study, mindfulness stands out as a key ingredient in recovery processes, in instances where psychological detachment from work is unlikely. That these findings has been consistent across two separate studies, at the between and within person level, strengthens the case for generalisability of findings not

just to the wider coaching profession but also to other occupations or to individual workers who do not find it possible or even desirable to completely 'switch off' from thinking about their work. This is becoming more salient as where people increasingly have the ability to work anywhere and at any time.

Accordingly, Study 2 in this thesis focused specifically the relationship between mindfulness, affective rumination, and daily recovery from work demands. Results from that study were consistent with the findings of Querstret et al. (2017), who tested the effectiveness of a mindfulness-based intervention on levels of affective and problem solving rumination, as well as recovery related outcomes. They found that participation in mindfulness training predicted lower levels of affective rumination, lower fatigue, and higher sleep quality, compared with a control group. Taken together, the work of Querstret et al. (2017) and study 2 of the present thesis present a fuller picture of the role of mindfulness in recovery, suggesting that both trained and untrained mindfulness are predictive of lower levels of affective rumination, and better recovery from work demands. However, while Querstret et al. (2017) included work patterns and work hours as variables in their analysis, neither study included a measure of the perceived demands or stressors participants faced at work and therefore needed to recover from. As noted earlier in this chapter, mindfulness is thought to influence all aspects of the stress appraisal process (Weinstein et al., 2009), and the results of Study 3 in this thesis suggest that higher mindfulness predicts a lower likelihood of day to day events being perceived as stressful. Stress often precedes rumination (Brosschot et al., 2006) and it is also possible that rumination predicts further stress appraisals. Future research could focus on determining where mindfulness is most impactful. Mindfulness may be related to better recovery because mindful people have less to recover from, or because mindful people ruminate less on the demands and stressors they do experience, or both. Being more specific

about how mindfulness and recovery are connected would provide an even fuller understanding of how mindfulness can benefit coaches and workers in general in their day to day lives.

While the studies in this thesis focus on the experience of sport coaches, the findings are likely to generalize to other occupations where people face a range of demands, and need to draw on personal resources in order to meet those demands. For example, employees in teaching or caregiving roles are thought to be susceptible to burnout (Maslach, Schaufeli, & Leiter, 2001), potentially because of the volume and enduring nature of emotional demands associated with the job. Additionally, the literature on 'calling' occupations – occupations where work brings an individual a sense of meaning, passion, and purpose - suggests that personally meaningful work, while usually associated with positive outcomes, can bring greater exposure to emotionally and interpersonally stressful environments, therefore drawing heavily on personal resources and increasing the risk of burnout (Duffy, Dik, Douglass, England, & Velez, 2018). There are likely a range of occupations and settings where mindfulness could help to facilitate recovery processes, to prevent detrimental work-related outcomes, and to promote wellbeing.

Each of the three studies in this thesis were concerned with either job demands, or personal resources, or both. The thesis contributes further evidence consistent with JD-R by demonstrating its applicability in a non-traditional work setting (Studies 1 and 2). Additionally, Studies 2 and 3 suggest that mindfulness is a personal resource which, while not necessarily used to meet job demands, can affect the appraisal of those demands (Study 3), and can aid in the acquisition and replenishment of other personal resources which are called on during the working day.

With regard to the sport coaching literature in particular, the studies make novel contributions. Existing research relating to coach wellbeing has largely focused on common

causes and consequences of coach stress. Emphasis has been placed on the circumstances which lead coaches to experience burnout (for example, ongoing experiences of stress) and on the negative consequences of burnout for both the coaches themselves and those they coach, clearly presenting this as a challenge for individual coaches and for the profession. Yet, so far, relatively little attention has been given to factors which reduce the likelihood of coach burnout. The studies in the present thesis address this less-researched area, by focusing on the role of mindfulness in the process of stress appraisal and, to a larger extent, the process of daily recovery from work demands, amongst coaches. The studies show that when participating coaches were more mindful, they were less likely to note events as being stressful in their daily life, less likely to ruminate on coaching related issues in the evening and appeared better able to achieve recovery from work demands. These findings, combined with the knowledge that dispositional mindfulness can be enhanced through regular training and practice (Quaglia, Braun, Freeman, McDaniel, & Brown, 2016), form the groundwork for potential practical mindfulness based strategies to help combat the known challenges of coach stress and burnout, and to help promote coach wellbeing.

The studies in the present thesis are not the first to consider the utility of mindfulness for sport coaches. At least two previous studies have tested and found positive results for the efficacy of mindfulness-based stress reduction interventions, which were developed for coaches working at a competitive level (Longshore & Sachs, 2015; Lundqvist et al., 2018). In addition, several mindfulness-based training programmes have been developed for athletes to either complement or replace more traditional forms of mental skills training, and coaches have also been influenced by and benefitted from such programmes both in their coaching and in their day to day lives (Baltzell, Caraballo, Chipman, & Hayden, 2014; Baltzell, McCarthy, & Greenbaum, 2014). The present research is novel, however, in that it investigates the role of naturally occurring rather than trained mindfulness, in coach wellbeing. In addition, the

research is focused on coaches at all levels rather than those working in high performance or competitive environments. For these reasons, the present research offers unique insight into ways that coaches across the coaching spectrum might benefit from increased mindfulness in their day to day lives. This is important, given that the challenges of stress and burnout can occur at any competitive level (cf. Potts et al., 2019), and that stress can occur in sporting settings but also in other areas of life.

One of the potential barriers to mindfulness training for coaches is the perceived time, effort, and commitment required, for people who may already be busy to the point of overload. Traditional Mindfulness Based Stress Reduction programmes run over eight weeks and include weekly group session of 2.5 hours as well as a six-hour retreat (Khoury, Sharma, Rush, & Fournier, 2015). However, since the creation of that programme in the 1970's, a large number of other evidence-based forms of mindfulness intervention have been developed, some of which are much shorter in duration but still effective, and research has established that there is no necessary 'dose' for mindfulness training (Creswell, 2017). Training delivery has become similarly flexible; in recent years a range of accessibly and inexpensive internet and smartphone-based mindfulness programmes have become available. While research on the safety and efficacy of these programmes is limited, initial studies suggest there are benefits to users (Creswell, 2017). There is potential, therefore, to develop user-friendly, accessible mindfulness training resources that could be of practical benefit to coaches.

Additionally, mindfulness can be built and maintained through informal as well as formal practice, informal practice being the incorporation of mindfulness into everyday tasks and existing routines (Birtwell, Williams, van Marwijk, Armitage, & Sheffield, 2019). Hanley et al. (2015) showed that using the task of washing dishes as an opportunity for informal contemplative practice can increase state mindfulness, a finding which demonstrates the potential of embedding mindfulness activities into daily living tasks in order to increase

mindfulness. Given that mindfulness training can brief, can be delivered online, and can be built into everyday activities, it seems feasible that training programmes could be developed to meet the needs of coaches. This is a potential 'next step,' to draw from and build on findings from the present studies, and further contribute to the coaching literature.

Methodological considerations

One of the strengths of the present research is that the samples in each study included coaches from a wide range of coaching settings, reflecting the blended nature of the coaching profession (Duffy, 2011). Some participants were employed as coaches on a full-time basis, while some coached part time and had additional forms of employment. Some coaches were working at highly competitive levels and others were working at grassroots with their local club or school. This meant that the research findings are likely to be generalisable to the wider coaching population, compared with much of the existing coach stress research which focuses on coaches working at elite levels (Norris et al., 2017). However, the diversity amongst the coaches in the study samples means it is likely that the types of demands and potential stressors they face are also diverse. Their coaching demands could differ in volume, frequency and magnitude depending on their work settings (Olusoga, Bentzen & Kenttä, 2019). Each of these factors would likely have an impact on the coaches' stress perceptions, and the degree to which they needed to recover from work demands. While Study 1 measured and controlled for perceived stress, none of the studies included measures, either objective or subjective, of work demands. This limits each study somewhat, as it is possible that the coaches who reported fewer stress appraisals, better recovery, or both, actually faced fewer demands and potential stressors each day.

The first study in this thesis formed the platform for the second, by exploring relationships between dispositional mindfulness amongst coaches, different conceptualisations

of work-related rumination, and recovery related outcomes. That first study was limited to a degree by its cross-sectional design, which meant it provided group level data about recovery, and the data was taken from one point in time. This approach is at odds with the conceptualisation of recovery, which is a process that takes place over time and within individuals (Geurts & Sonnentag, 2006). However, a cross-sectional research design can be an efficient way of gathering exploratory information on a number of variables, some of which may focused on in later work (Spector, 2019). In this case, Study 1 was deliberately planned as a cross-sectional study in order to provide an overview of mindfulness and recovery amongst a larger sample of coaches, before moving to a more intensive design with a smaller sample, that conceptualised recovery as a daily process (Study 2). Despite limitations associated with cross-sectional research, Study 1 was ultimately valuable in that it highlighted a variable (affective rumination) that appeared to be most implicated in the relationship between mindfulness and recovery, and which could therefore be focused on in the subsequent diary study. Given the relatively long data collection period for the diary study, compared to other diary studies in occupational settings, (e.g., Demerouti, Bakker, Sonnentag & Fullagar, 2012; Mojza, Lorenz, Sonnentag, & Binnewies, 2010; Sonnentag, 2001) it was important to keep surveys brief and focused on variables of interest (Bolger & Laurenceau, 2013). Including affective rumination but excluding the other conceptualisations of work-related rumination included in the first study, was one way of doing this.

Studies 2 and 3 drew on daily diary data from provided by coaches over a 28-day period, and this intensive data collection process is a strength of the current thesis. Participation and engagement were high for the duration of the study, with the mean survey completion rate being 24.59 of a potential 28 days, and this provided a large amount quality data for analysis. Several steps were taken to encourage coaches to contribute to and remain in the study for the duration. Firstly, the daily emails which accompanied surveys were friendly and conversational

in tone, asking for rather than requesting participation. The survey questions themselves remained consistent throughout the month, to ensure validity, but the brief pieces of text surrounding the questions were changed from day to day. Details were updated in keeping with things like the local weather, current events, and weekend sports results. Greetings, and acknowledgment of participants' time and effort, were also changed daily. The surveys included notes of encouragement, in terms of how far through the month participants were and how many more surveys they had to complete. These efforts combined to give the surveys a more personal feel and to communicate to participants that the researcher was genuinely interested in them and the information they were providing. The process created extra work for the researcher through the data collection period but may have helped to combat the challenge of participant retention, which is a common issue when lengthy and intensive data collection processes are used (Bolger & Laurenceau, 2013).

The main reason for collecting daily data was that it provided the opportunity, through multilevel modelling, to analyse relationships between variables at the within as well as between person level. This type of analysis is particularly important for research which focuses on processes that take place within individuals. Much research in psychology draws on large sample data and draws on summary (or aggregate) statistics, but the relationships that are evident in aggregate data do not necessarily reflect what takes place within individuals (Hamaker, 2012). It would have been premature to assume that the cross-sectional relationships between mindfulness, rumination, and recovery related outcomes that were found in study 1 in the present thesis were an accurate reflection of the processes taking place within individual coaches. The use of daily diary data and multilevel modelling in Studies 2 and 3 allowed for analysis at the between and within person level. The between person analysis provided information on whether people who were higher in mindfulness were more likely to report certain outcomes (e.g., recovery, stress, highlights) while the within person analysis showed

whether higher mindfulness on a given day was associated with the same outcomes (Pindek et al., 2018). As it turned out, relationships at the within person level did reflect those at the group level, and in the cross-sectional study, thus strengthening the evidence base for the argument that dispositional mindfulness helps to promote recovery from work demands.

A second advantage of collecting data on a daily basis was that it enabled the lagging of variables in the analysis process, and this meant that the temporal order of relationships between variables could be examined (Bolger, 2013). For example, by lagging the daily mindfulness variable in Study 2, it was possible to examine how mindfulness on a given day predicted rumination that evening, and predicted recovery related variables the following day. This meant that the cross-sectional relationships established in study 1 could be tested across time in study 2 and provided some evidence for the temporal order of relationships between variables. (It should be noted, however, that lagging was not used in Study 3, meaning that the relationships that were found in that study are essentially cross-sectional in nature).

An important consideration when designing the diary study was the need to keep the daily surveys brief, to minimise the demand placed on participants. A related consideration was how frequently, and at what time of day, the surveys should be emailed to participants. While the possibility of a morning and evening survey was considered, it was decided that the additional disruption for participants was unreasonable. One survey per day, emailed in the evening, meant participants could choose to complete it once work and other responsibilities were complete for the day, and they would also be able to reflect on the entire day that had just taken place. The once per day data collection does, however, bring the risk of retrospective bias on the part of participants, when answering questions at the end of the day relating to states of mind earlier and throughout the same day. This is particularly so for the rumination question in Study 2, where participants were asked to reflect on work related rumination the previous evening. The question may have been more accurately answered first thing the following

morning in a separate survey, but – as noted earlier – this would have created extra disruption for and burden on participants. Given that one of the aims of Studies 2 and 3 was to engage participants over a long enough period to capture some of the ups and downs in daily life, the longer time frame was considered a greater priority than more frequent data collection and a trade-off was made. This highlights the types of challenge inherent in diary research, and the methodological decisions that must be made.

In addition to deciding when and how frequently to measure study variables, a decision needed to be made about how to measure mindfulness. The technique most commonly employed in mindfulness research is the use of self-report questionnaires, and on the whole, this is considered a suitable method (Baer, 2018). Most of the established mindfulness questionnaires have reasonable psychometric properties (Baer, 2018); the problem is, however, that there are at least eight different questionnaires (Bergomi, Tschacher, & Kupper, 2013) all aiming to measure the same construct. The number of questionnaires reflects debate amongst scholars regarding the conceptualisation, operationalisation, and measurement of mindfulness (Bergomi et al., 2013; Grossman, 2008; Sauer et al., 2013). Differing opinions mean that the various scales differ somewhat in terms of whether mindfulness is measured or a multifaceted construct (Bergomi et al., 2013).

The Mindfulness Attention and Awareness Scale (MAAS, Brown & Ryan, 2003) was selected for the studies in the present thesis (trait version for Study 1, and state version for Studies 2 and 3), largely because it was developed to measure dispositional mindfulness, rather than mindfulness skills or states trained through meditation or other practice (Brown & Ryan, 2004). It was therefore suitable for the purposes of the present research, which aimed to find out more about the benefits of dispositional mindfulness in coaches. The scale has been criticised for its approach (e.g., Grossman, 2011) in that it essentially measures inattentiveness, arguably the opposite of mindfulness, and reverse scores the items to produce a mindfulness

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score. This leaves the possibility, and criticism, that the scale does not measure mindfulness, but something like it (Grossman, 2011), and in doing so fails to capture the full range of mindfulness experiences (Bergomi et al., 2013). In addition, the scale measures mindfulness as single construct, focusing on attention and awareness rather than other attitudes associated with mindfulness (e.g., non-judgment, acceptance). Brown, Ryan, Loverich, Biegel, and West (2011) respond to these criticisms, arguing that the scale captures what they consider most fundamental and foundational to mindfulness (attention and awareness), and that the scale items need to be understood by laypeople rather than those with training in or technical knowledge of mindfulness. The scale items present situations which people can easily recognise and respond to, without any prior knowledge or understanding of mindfulness (Brown & Ryan, 2003). Despite its critics, the MAAS is one of the most commonly used measures of mindfulness and has been shown to have a strong factor structure and good construct validity (Baer, 2018; MacKillop & Anderson, 2007). It was, therefore, a suitable measure to be used and relied upon in the present thesis. Additionally, its use means that findings from the present research are comparable with the larger number of other studies which have also utilised the MAAS.

Concluding comments

Sport is important to New Zealanders, and to the nation. Sport helps to create a happier, healthier, more connected society. Organised sport is reliant on infrastructure, and coaches are an integral part of that infrastructure. Coaches have a hugely influential role, no matter where in the coaching spectrum they work. Some coaches are in a position to develop Olympic level athletes, while others help children to learn social skills and gain their first taste of their chosen sport. Some coaches might help adults to take up new physical challenges and to improve their health and fitness. Coaches are important, valuable, and needed members of the community. Coaching, however, can be a demanding and challenging role. Coaches are primarily concerned

with promoting the growth, development and success of others, but if they are to do this well their own wellbeing is paramount.

The three studies in this thesis position mindfulness as a valuable personal resource, which may assist coaches to maintain their own wellbeing while meeting the day to day demands of coaching and of other aspects of their lives. Mindfulness appears to be influential both in terms of the stress that coaches experience, and in their ability to recover from the daily demands of their work. Mindfulness is an inherent human capacity; everyone has the ability to be mindful, and mindfulness can be developed and enhanced over time. For coaches who struggle with the demands and pressures of their job, or for the organisations who employ or support those coaches, focusing on day to day mindfulness could be a powerful strategy for improving and maintaining wellbeing.

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Appendix 1: Human Ethics Committee Approval

HUMAN ETHICS COMMITTEE

Secretary, Rebecca Robinson
Telephone: +64 03 364 2987, Extn 45588
Email: human-ethics@canterbury.ac.nz

Ref: HEC 2016/23

20 May 2016

Fleur Pawsey
Psychology
UNIVERSITY OF CANTERBURY

Dear Fleur

The Human Ethics Committee advises that your research proposal "Work Stress and Recovery in Professional Sport Coaches" has been considered and approved.

Please note that this approval is subject to the incorporation of the amendments you have provided in your email of 16th May 2016.

Best wishes for your project.

Yours sincerely

pp. R. Robinson

Jane Maidment
Chair
University of Canterbury Human Ethics Committee

Appendix 2: Call for participants, Study 1

Coaches, work stress, recovery and wellbeing – PhD research

Coaches! Your athletes focus on rest, recovery, and wellbeing. Do you?

What allows you to get out of bed in the morning and give your best to your job, even when not everything is going right?

I'm a PhD student in the Psychology department at the University of Canterbury, carrying out research on the health and wellbeing of professional sport coaches, and I'd really like to hear what you have to say. I'm looking at stress and recovery, on a day to day basis, among coaches. I'm interested not just in the tactics employed to recover from work stress, but also in personal characteristics, and strategies, which equip coaches to handle the daily stressors of work. Why do some people bounce back easily from stressful situations, when others experience strain?

The aims of this research are:

- To identify sources of job stress amongst professional sport coaches in New Zealand, and to explore and evaluate the effectiveness of strategies currently used by coaches, in order to cope with work-related stress

- To learn more about the personal characteristics and practices that act as a buffer to the negative effects of stress, and to develop and test a specific recovery-promoting intervention

Coach participation – What's involved?

At this point, I'm looking for coaches to participate in the first of three planned studies. If you take part, all you'll need to do is complete a one-off, on-line survey that should take no more than 20 minutes to complete. You'll be asked questions about your work as a coach, your general health and wellbeing, and about some of your leisure activities outside of work.

If you participate in this study, you'll have the option to volunteer for a second study, planned for 2017. In the second study you'll be asked to complete a brief daily survey, delivered online, over a period of 1 to 2 weeks. On completion you'll have the option to receive a summary of your own results, which may give valuable insight into your own patterns of work stress and recovery.

By participating in this study, you'll be contributing to a growing body of knowledge about how best to promote the psychological wellbeing of coaches. This has the potential to boost coach performance with a flow-on effect on athlete performance, and to help ensure that coaching is a valued and sustainable career.

Kind regards,
Fleur Pawsey (fleur.pawsey@pg.canterbury.ac.nz)

This study has been approved by the University of Canterbury Human Ethics Committee.

Stress, recovery, and well-being in sport coaches

Q53 **Stress, recovery, and well-being in sport coaches** You are invited to take part in a survey asking questions about stress, recovery, and well-being among sport coaches. **We know that you are busy, but we really appreciate your input.**

The survey is being carried out as part of a PhD in Applied Psychology at the University of Canterbury by Fleur Pawsey, under the supervision of Katharina Näswall. They will both be pleased to discuss any concerns you may have about participation in the project. The survey will ask you questions about your workload, as well as about your general wellbeing and your energy levels both in and out of work. **This survey is completely confidential, and you will not be identified as a participant.** Some of the questions in the survey may concern sensitive issues, such as your perception of your personal stress levels and of your work demands. If you do not feel comfortable answering these questions, or you experience distress, feel free to withdraw from the survey at any time. If you require further assistance, we have provided a list of potential sources of help at the bottom of this page. The results of this research may be published in academic journals or conference proceedings. You will have the opportunity to receive a summary of our findings, but this will not include any individual responses or comments. Full results will be published in a thesis, which will be available through the University of Canterbury Library. The results of this research may also be published in academic journals. All data collected for this study will be kept on a password-protected computer at the University of Canterbury and will be destroyed after five years. **The survey should take around 30 minutes to complete**. If you do not have time to complete all the questions in one sitting, you can return to it later. Simply click the link provided in the invitation letter (this will only work if you are at the same computer). You may withdraw your participation, including withdrawal of any information you have provided, up until the time your responses have been submitted. **By submitting the questionnaire it will be understood that you have consented to participate in the project, and that you consent to publication of the results of the project with the understanding that anonymity will be preserved.** As a thank you for completing the questionnaires, you will have the opportunity to win a $100 voucher for any Health2000 store. If you'd like to go into the prize draw, you'll be asked to provide an email address. Please note that your email address will not be linked to your responses to any of the survey questions. You will also have the opportunity to indicate your interest in participating in future research. Please note that for data analysis purposes, your future survey responses may be linked to data you provide in the initial survey. Data will be linked using computer generated identifier codes. **Your responses will not be linked to your name, or to any other identifying details**. Participation in future research is voluntary and you will be under

no obligation to do so.   This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).   Many thanks,
 Fleur Pawsey (fleur.pawsey@pg.canterbury.ac.nz) Ph. 021 295 3927
 Dr Katharina Näswall (katharina.naswall@canterbury.ac.nz) Ph. 03 364 2552
        Lifeline New Zealand offers free phone-based counselling and support. Lifeline can be contacted at 0800 543 354
        The New Zealand Association of Counsellors provides a counsellor search tool which enables you to find counselling services and is accessible at http://www.nzac.org.nz   *Or contact your local GP*

Q58 To continue onto the survey, please check the box below:

○ I have read and understood the information above, and I agree to take part in the survey (1)

Page Break ───

Q3 Thanks for agreeing to take part in the survey. Let's get into it!

We're starting off by asking a few questions about your general health.

Health general
Please drag the slider below to answer to give yourself scores for the first two questions.

	0	1	2	3	4	5	6	7	8	9	10

| In general, how would you rate your current overall health (0 = extremely poor, 10 = extremely good) () | |

Health physical

	0	1	2	3	4	5	6	7	8	9	10

| In general, how would you rate your current physical health (0 = extremely poor, 10 = extremely good) () | |

Page Break

ES Please indicate how much you think each of the following statements describes you.

	Describes me extremely well (1)	Describes me very well (2)	Describes me moderately well (3)	Describes me slightly well (4)	Does not describe me (5)
I am relaxed most of the time (ES_1)	○	○	○	○	○
I seldom feel blue (ES_2)	○	○	○	○	○
I get stressed out easily (ES_3)	○	○	○	○	○
I worry about things (ES_4)	○	○	○	○	○
I am easily disturbed (ES_5)	○	○	○	○	○
I get upset easily (ES_6)	○	○	○	○	○
I change my mood quite a lot (ES_7)	○	○	○	○	○
I have frequent mood swings (ES_8)	○	○	○	○	○
I get irritated easily (ES_9)	○	○	○	○	○
I often feel blue (ES_10)	○	○	○	○	○

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Sleep Thinking back over the last month, how often you have been bothered by the following complaints?

	Never (1)	Sometimes (2)	About half the time (3)	Most of the time (4)	Always (5)
Difficulties falling asleep (Sleep_1)	○	○	○	○	○
Repeated awakenings with difficulties falling asleep again (Sleep_2)	○	○	○	○	○
Premature awakenings (Sleep_3)	○	○	○	○	○
Disturbed/restless sleep (Sleep_4)	○	○	○	○	○
Not well rested on awakening (Sleep_5)	○	○	○	○	○
Feelings of being exhausted on awakening (Sleep_6)	○	○	○	○	○

Page Break

	Never (1)	Sometimes (2)	About half the time (3)	Most of the time (4)	Always (5)
I could be experiencing some emotion and not be conscious of it until sometime later (TM_1)	○	○	○	○	○
I break or spill things because of carelessness, not paying attention, or thinking of something else (TM_2)	○	○	○	○	○
I find it difficult to stay focused on what's happening in the present (TM_3)	○	○	○	○	○
I tend to walk quickly to get to where I'm going without paying attention to what I experience along the way (TM_4)	○	○	○	○	○
I tend not to to notice feelings of physical tension or discomfort until they really grab my attention (TM_5)	○	○	○	○	○

I forget a person's name almost as soon as I'm told it for the first time (TM_6)	○	○	○	○	○
It seems I am 'running on automatic' without much awareness of what I am doing (TM_7)	○	○	○	○	○
I rush through activities without being really attentive to them (TM_8)	○	○	○	○	○
I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there (TM_9)	○	○	○	○	○
I do jobs or tasks automatically, without being aware of what I'm doing (TM_10)	○	○	○	○	○
I find myself listening to someone with one ear, doing something else at the same time (TM_11)	○	○	○	○	○

I drive placed on 'automatic pilot' then wonder why I went there (TM_12)	◯	◯	◯	◯	◯
I find myself preoccupied with the future or the past (TM_13)	◯	◯	◯	◯	◯
I find myself doing things without paying attention (TM_14)	◯	◯	◯	◯	◯
I snack without being aware that I'm eating (TM_15)	◯	◯	◯	◯	◯

Q22 Now we'll move on to focus on your work as a coach. Please note, even if you work as a coach in a voluntary capacity rather than in a paid role, it's still coaching work and we still really want to hear what you have to say.

Coach how long How long have you been working as a coach?

_____

What sport What sport/s do you coach?

_____

what level At what level do you coach? (e.g. performance, representative, club etc)

_____

Participation Do you currently participate in the sport/s that you coach?

○ Yes (1)

○ No (2)

part how long For how long have you participated in this sport?

_____

Q32 If you used to participate in the sport that you now coach, what caused you to give up participation?

_____

Page Break ————————————————————————————————————

hours per week On average, how many hours a week do you spend coaching?

_____

paid hours And for how many hours a week are you paid or contracted to coach?

_____

only employ Is your coaching work your only form of paid employment?

○ Yes (1)

○ No (2)

other hours For how many hours a week are you in other employment?

_____

Next, we're keen to hear about the impact your coaching work has on your life outside of work. In the last month, how often have you:

	Never (1)	Sometimes (2)	About half the time (3)	Most of the time (4)	Always (5)
been upset because of something that happened unexpectedly (Stress_1)	○	○	○	○	○
felt that you were unable to control the important things in your life (Stress_2)	○	○	○	○	○
felt nervous and 'stressed' (Stress_3)	○	○	○	○	○
felt confident about your ability to handle your personal problems (Stress_4)	○	○	○	○	○
felt that things were going your way (Stress_5)	○	○	○	○	○
found that you could not cope with all the tings that you had to do (Stress_6)	○	○	○	○	○
been able to control irritations in your life (Stress_7)	○	○	○	○	○
felt that you were on top of things (Stress_8)	○	○	○	○	○

been angered because of things that were outside of your control (Stress_9)

○　　　　　○　　　　　○　　　　　○　　　　　○

felt difficulties were piling up so high that you could not overcome them (Stress_10)

○　　　　　○　　　　　○　　　　　○　　　　　○

Page Break

How often would you say each of the issues listed below affect you?

	a few times a year (1)	Around once a month (2)	Around once a fortnight (3)	Weekly (4)	Almost every day (5)
I feel emotionally drained from my work (EE_1)	○	○	○	○	○
I feel used up at the end of the workday (EE_2)	○	○	○	○	○
I feel fatigued when I get up in the morning and have to face another day on the job (EE_3)	○	○	○	○	○
Working with people all day is a strain for me (EE_4)	○	○	○	○	○
I feel burned out from my job (EE_5)	○	○	○	○	○
I feel frustrated by my job (EE_6)	○	○	○	○	○
I feel I'm working too hard on my job (EE_7)	○	○	○	○	○
Working with people directly puts too much stress on me (EE_8)	○	○	○	○	○

	Never (15)	Sometimes (16)	About half the time (17)	Most of the time (18)	Always (19)
I become tense when I think about work related issues during my free time (AR1)	○	○	○	○	○
I get annoyed by thinking about work-related issues when I'm not at work (AR2)	○	○	○	○	○
I get irritated by work issues when I'm not at work (AR3)	○	○	○	○	○
I become fatigued by thinking about work-related issues during my free time (AR4)	○	○	○	○	○
I am troubled by work-related issues when not at work (AR5)	○	○	○	○	○
After work, I tend to think of how I could improve my work-related performance (PSR1)	○	○	○	○	○
In my free time I find myself re-evaluating something I have done at work (PSR2)	○	○	○	○	○

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After work, I think about tasks that need to be done at work the next day (PSR3)	○	○	○	○	○
I find thinking about work during my free time helps me to be creative (PSR4)	○	○	○	○	○
I find solutions to work-related problems in my free time (PSR5)	○	○	○	○	○
I feel unable to switch off from work (DTCH1)	○	○	○	○	○
I am able to stop thinking about work-related issues in my free time (DTCH2)	○	○	○	○	○
I find it easy to unwind after work (DTCH3)	○	○	○	○	○
I make myself switch off from work as soon as I leave (DTCH4)	○	○	○	○	○
I leave work issues behind me when I leave work (DTCH5)	○	○	○	○	○

	strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I find it difficult to relax at the end of a working day (NR_1)	○	○	○	○	○	○	○
By the end of a working day, I feel really worn out (NR_2)	○	○	○	○	○	○	○
In general, I only start to feel relaxed on the second day of a weekend/two day break from work (NR_3)	○	○	○	○	○	○	○
I find it difficult to concentrate in my fee time after work (NR_4)	○	○	○	○	○	○	○
I cannot really show any interest in other people when I have just come home from work myself (NR_5)	○	○	○	○	○	○	○
When I get home from work, I need to be left in peace for a while (NR_6)	○	○	○	○	○	○	○

Often, after a day's work I feel so tired I cannot get involved in other activities (NR_7)	○	○	○	○	○	○	○
A feeling of tiredness prevents me from doing my work as well as I normally would during the last part of the working day (NR_8)	○	○	○	○	○	○	○

Q92 You're almost there! Just a few easy questions to do.

age How old are you?

○ Younger than 20 (1)

○ 20-29 years (2)

○ 30-39 years (3)

○ 40-49 years (4)

○ 50-59 years (5)

○ 60 + (6)

Q96 What is your gender?

○ Male (1)

○ Female (2)

○ Other (3)

---

ethnicity What is your ethnicity?

○ NZ European (1)

○ Maori (2)

○ Cook Island Maori (3)

○ Pacific Islander (4)

○ Asian (5)

○ Other European (6)

○ Other (7)

End of Block: Block 11

Start of Block: Block 12

Q100 Nice work - you're at the end of the survey. As a thank you, we'd like to give you the chance to win one of five $100 Health2000 vouchers. If you'd like to enter the draw, please check the box below.

○ Yes, I'd like to enter the draw to win a Health2000 voucher (1)

Q57 We're also on the hunt for coaches to participate in a further study, scheduled for early 2017.

The focus will again be on health and well-being, but this time we'll be aiming for daily data-collection (using a much, much shorter survey, 2-3 min at most!) over a 1-2 week period. This could provide a great opportunity for self reflection, and you'll have the option of receiving a summary of your own results at the end of the study.

If you're happy to be contacted with regard to this study, please check the box below.

○ Yes, I'm happy to be contacted regarding future research. (1)

Q56 If you checked either of the boxes above, please enter your email address in the space below. Please be assured that the details you provide here will not be linked in any way to your survey responses.

_____

End of Block: Block 12

Appendix 4: Call for participants, Study 2

Coaches – I'm keen to hear from you!

I'm a PhD student (and part time multisport coach) looking into health and wellbeing amongst sport coaches. I think we all agree that coaching can be a demanding and stressful job at times. In sport, a lot of attention is given to making sure that athletes are at their best, mentally and physically. But what about the wellbeing of the coach?

I'm currently on the hunt for coaches who might be keen to participate in a new study. For participants, this will involve completing a **quick daily survey every day for four weeks**. It'll be really brief, taking you no longer than **2 minutes per day**. I'll email it to you each evening and the questions will relate to the day you have just had.

The daily questions will be about how well you 'switch off' from your coaching work each day and also about your mood, mindfulness, and energy levels each day. The study has been designed to be a great opportunity for self-reflection, as well as to provide research data, and you'll have the option of receiving a summary of your own survey responses at the end.

It doesn't matter how many days a week you are actually involved in coaching work – the only requirement is that you actively coaching.

If you participate, you'll have a chance to win one of four $250 New World vouchers. Free groceries!!

If you're keen to be involved please let me know by emailing me at fleur.pawsey@pg.canterbury.ac.nz, or you message me via Facebook.

Thanks so much!

Fleur Pawsey

PhD Candidate

Applied Psychology

University of Canterbury

0212953927

How was your night, and how has your day been? Day 1

Consent Thank you for expressing interest in participating in the second stage of research on well-being among sport coaches.   The purpose of this study is to find out more about daily recovery from the demands of being a coach. If you agree to participate in this study you will be asked to complete a **brief daily questionnaire every day over a four week period**. Each questionnaire should take no more than 2-3 minutes to complete.   Please note that participation in this project is voluntary and you have the right to withdraw at any stage without penalty. If you withdraw, any information relating to you will also be withdrawn, as long as this is practically achievable.   To ensure confidentiality, data will be linked using unique identifier codes. **Your responses will not be linked to your name or any other identifying details.**   The results of the project may be published, but you can be assured of the complete confidentiality of data gathered in this research. Data will only be accessed by the researcher and research supervisor, and will be stored securely in password protected facilities and locked storage at the University of Canterbury. Data will be destroyed after a ten year period.   Some of the questions in the survey may concern sensitive issues, such as mood and energy levels, and events you perceive to be stressful. If you do not feel comfortable answering these questions or experience distress, feel free to withdraw from the survey. If you require further assistance, we have provided a list of potential sources of help at the bottom of this page.   On completion of the research, you will have the opportunity to receive a written summary of your individual results. You will also have the option of receiving weekly summaries during the data collection period if this is of interest to you.   As a thank you for your participation in the study, you will have the opportunity to enter the draw to win a $250 New World voucher. The final survey in the four week block will include a link to enter into the draw.   This project is being carried out by Fleur Pawsey, under the supervision of Katharina Naswall, as part of a PhD in Applied Psychology at the University of Canterbury. We are both happy to discuss and questions or concerns you might have about your participation in this project.   Many thanks,
 Fleur Pawsey (fleur.pawsey@pg.canterbury.ac.nz) Ph. 021 295 3927
 Dr Katharina Näswall (katharina.naswall@canterbury.ac.nz) Ph. 03 364 2552   ·   Lifeline New Zealand offers free phone-based counselling and support. Lifeline can be contacted at 0800 543 354   ·   The New Zealand Association of Counsellors provides a counsellor search tool which enables you to find counselling services and is accessible at http://www.nzac.org.nz   Or contact your local GP

This study has been reviewed and approved by the University's Human Ethics Committee. To continue to the survey, please check the box below.

○ I have read and understood the information above and agree to participate in the survey (1)

Page Break ——

Info The questions on the next two screens are for today only - you won't be completing them on a daily basis :)

Coaching level What level are you currently coaching at? (e.g. school, community, club, representative, high performance)

_____

Only employment? Is coaching your only form of employment?

◯ Yes (1)

◯ No (2)

Hours per week How many hours per week do you typically work?

_____

Hour split Roughly how many hours per week would you spend coaching, and how many hours per week would you spend in your primary or other employment?
(note - we're still keen for you to participate in this study if your coaching is voluntary rather than paid employment).

_____

_____

_____

_____

_____

Tenure For how long have you been a coach?

◯ Less than one year (1)

◯ 1-5 years (2)

◯ 5-10 years (3)

◯ 10+ years (4)

Age How old are you?

◯ 18-20 years (1)

◯ 21-30 years (2)

◯ 31-40 years (3)

◯ 41-50 years (4)

◯ 50+ years (5)

Page Break

Mindful Right, we're onto the regular questions. Don't think too long on these - just go with the first response that comes to mind. This should be pretty quick!

Thinking back on the day you've just had, how much do you agree with each of the statements listed below?

	Strongly disagree (8)	Disagree (9)	Somewhat disagree (10)	Neither agree nor disagree (11)	Somewhat agree (12)	Agree (13)	Strongly agree (14)
I found it difficult to stay focused on what was happening in the present. (Mindful_13)	○	○	○	○	○	○	○
I rushed through activities without being really attentive to them (Mindful_14)	○	○	○	○	○	○	○
I did jobs or tasks automatically, without being aware of what I was doing (Mindful_15)	○	○	○	○	○	○	○
I found myself preoccupied with the future or the past (Mindful_16)	○	○	○	○	○	○	○
I found myself doing things without paying attention (Mindful_17)	○	○	○	○	○	○	○

Rumination This time think back to your free time **last night**, after work. How much do you agree with each of the statements listed below? (By 'work', we're referring to your coaching work).

	Strongly disagree (9)	Disagree (8)	Somewhat disagree (10)	Neither agree nor disagree (11)	Somewhat agree (12)	Agree (13)	Strongly agree (14)
I became tense when I thought about coaching related issues during my free time (1)	○	○	○	○	○	○	○
I got annoyed by thinking about coaching related issues when not at work (2)	○	○	○	○	○	○	○
I became irritated by coaching issues when not at work (3)	○	○	○	○	○	○	○
I felt fatigued by thinking about coaching-related issues during my free time (4)	○	○	○	○	○	○	○

| I was troubled by coaching-related issues when not at work (5) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Q4 Now we'd just like a few quick ratings from you. Please mark your score on the line below.
Note: 0 = extremely poor 10 = extremely good

0 1 2 3 4 5 6 7 8 9 10

Please rate, out of 10, your overall mood today. ()	
Now, out of 10, rate your energy levels today. ()	
And finally, please rate out of 10 the quality of your sleep last night. ()	

Stress Did anything especially stressful happen today? (add details if you feel comfortable doing so)

_____

_____

_____

_____

_____

Highlight What was the highlight of your day today?

_____

_____

_____

_____

_____

Thanks You're done! That's it for today. The surveys from tomorrow onward will be slightly different.

Thanks again for committing to the project! Enjoy the rest of your evening :)

Appendix 6: Example of response summary for participants, Study 2

Coaching Survey Week One: Summary Results

Firstly, thanks so much for your involvement in the study so far. I've collated your data from the first 8 days of the study and included this in the graph and table on the next page. Please note, this only includes the quantitative data you provided (scores and rankings). Due to time constraints I won't include information on the daily stressors/highlights in these weekly summaries.

Before you move on to looking at your data, here is an overview of the measures included in the daily survey, and the relationships that may (or may not!) be seen in the daily data.

Mindfulness

Mindfulness can defined as an open awareness of dwelling on the past or worrying about future events. Research suggests that while we all have a general tendency to be more or less mindful, mindfulness levels can also fluctuate from day to day.

One of the sets of questions you have been answering is a scale designed to measure daily mindfulness levels. I've calculated a daily score from your responses.

Rumination

The other set of questions is a scale designed to measure work (specifically, coaching) related rumination.

Work related rumination is perseverative thinking about or dwelling on problems related to work, during your leisure time. Again, I've used your responses to calculate a daily score.

Mindfulness, Rumination, and Recovery

Based on what is known about mindfulness, it is expected that on days when you are more mindful you're more 'in the present' and less likely to dwell on work problems. This could in turn mean better recovery from the demands of work.

To get an idea about recovery you've been asked to record your sleep quality each night, as well as your daily mood and energy levels. It is expected that on days when you are well recovered from work demands you'll report a good night's sleep, be in a better mood and have higher energy levels.

Putting it all together…

In theory, what this means is that higher mindfulness may be related to lower rumination, better sleep, a good mood, and more energy.

I've plotted your daily scores against one another so you can have a look for yourself. A cautionary note: one week is still short space of time for this sort of study, so it may be too soon to see anything interesting. After four weeks, however, it might be a different story.

Also note that days are combined; that is, I'm looking at your mindfulness/rumination scores on Monday (for example) in relation to your sleep on Monday night and your energy and mood on Tuesday.
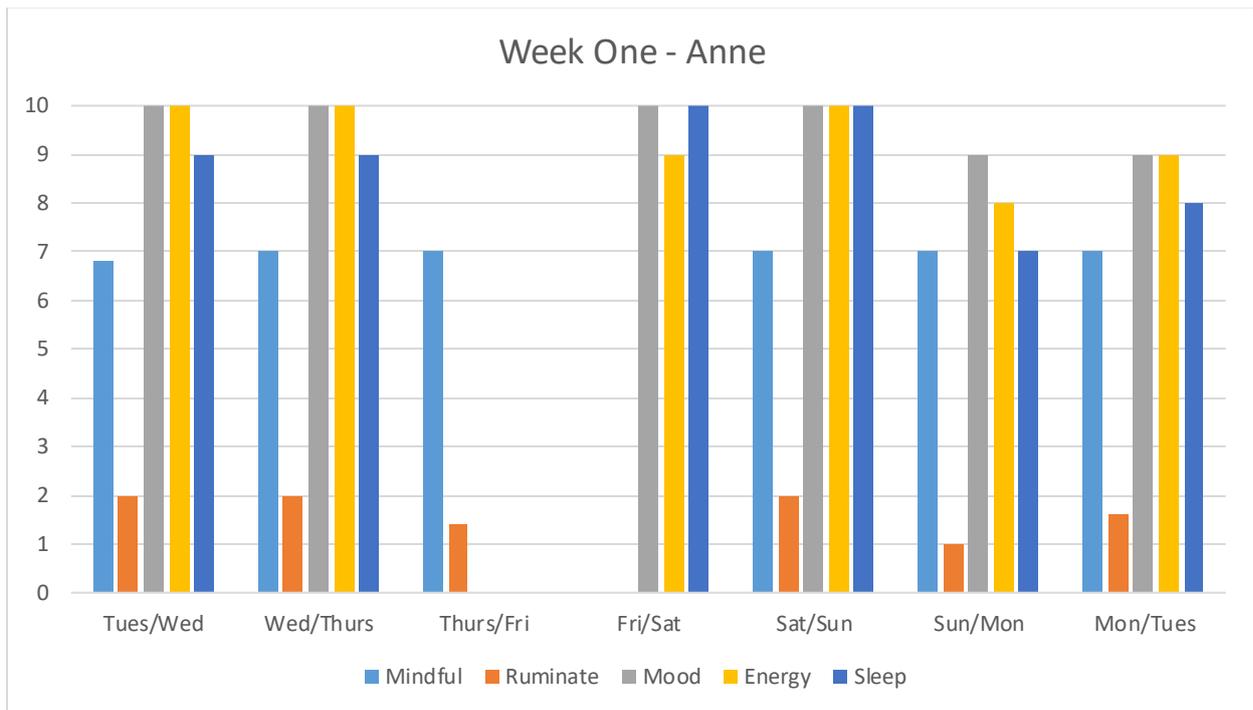

Figure 1: Daily survey scores. Note: Mindfulness and rumination were measured on a scale of 1-7; mood, energy and sleep quality were measured on a scale of 1-10.

Daily scores: Anne

	Mindfulness	Rumination	Mood	Energy	Sleep
Tues/Wed	6.8	2	10	10	9
Wed/Thurs	7	2	10	10	9
Thurs/Fri	7	1.4	-	-	-
Fri/Sat	-	-	10	9	10
Sat/Sun	7	2	10	10	10
Sun/Mon	7	1	9	8	7
Mon/Tues	7	1.6	9	9	8
Daily Average	6.97	1.67	9.67	9.33	8.83

If you have any questions at all, or you're just keen to discuss the study, please don't hesitate to get in touch.

 (fleur.pawsey@pg.canterbury.ac.nz; Ph. 021 295 3927)

Appendix 7: Time series plots of individual participant data, Study 2
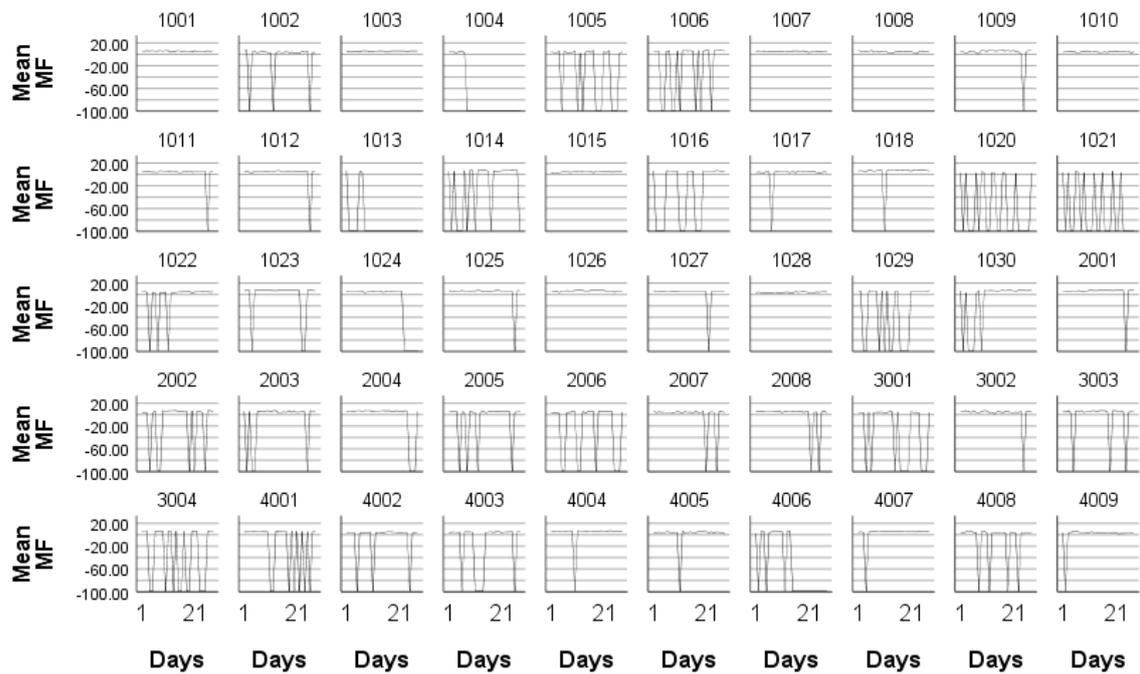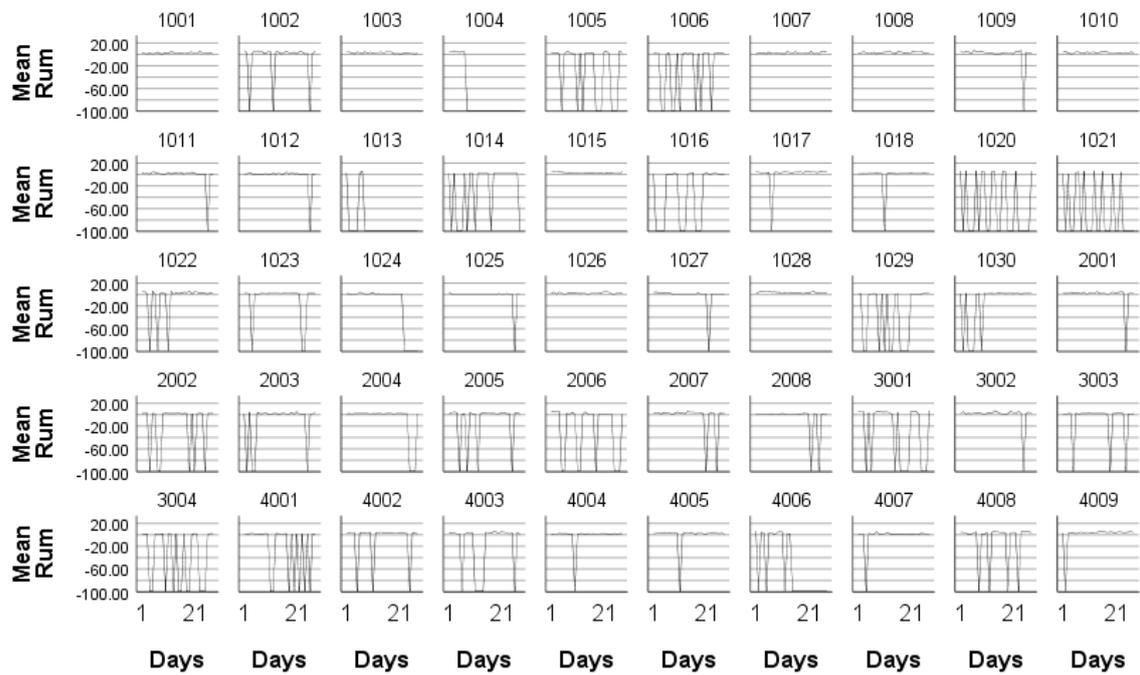
Appendix 8: Coding dictionary for coding of qualitative data, Study 3

CODING DICTIONARY – DAILY STRESSORS AND HIGHLIGHTS

Background information

This data comes from a 'diary study' in which, each day for 28 consecutive days, participants were asked:

- o Whether anything stressful had happened (and prompted to provide detail if they felt comfortable doing so)
- o What was the highlight of their day?

Participants were a group of sports coaches, so much but not all of the data relates to coaching or sporting activities. Sport and non-sport related information should be coded in the same way; it makes no difference to the research questions or analysis.

Some notes for coding:

- Unit of analysis can range from the full diary entry (max) to individual words (min). I.e. you might consider the entire entry to relate to only one coding category, or you might decide to assign multiple codes to a single diary entry. However, you should focus on coding the main object of the highlight/s
  For example (multiple codes): *"lunch with good friends including some of my athletes and our open free conversation about where we had come and where we wanted to go - in terms of riding the sharing and honesty"*
  Coded as: "lunch (EVACT) with good friends (REL) including some of my athletes and our open free conversation about where we had come and where we wanted to go (MAST) in terms of riding the sharing and honesty
  (The main objects were interpreted as being the lunch with good friends, and ensuing conversation, not the sharing and honesty.

- You should only code what is in front of you – try not to make assumptions or read between the lines, simply code the text that appears.

		HIGHLIGHTS		
THEME	CODE	DESCRIPTION	EXAMPLES	CODE
Achievement (Performance)	**PERF**	Highlight relates to achievement (on part of self or a coached athlete), demonstration of ability or competence, focus on results, may include comparison with others Highlight fuels the ego: should explicitly mention results, performance, or comparison outcome. Needs to have subjective evaluation of performance: "All players attended training" – not PERF "Team training went well" – is PERF	"We beat Southland today in our game, it was the 1st time we have beaten them in 8yrs" "Great performance breakthrough for one of my athletes resulted in a double gold medal performance at nationals and an NZ record. Finally, after a lot of struggle for this athlete this year!"	1 = present 0 = not present
Achievement (Mastery)	**MAST**	Highlight relates to one's own learning, gaining understanding, development, growth (work or non-work) Not mutually exclusive from PERF. Need to be the coaches' own experience of mastery, rather than their players. Coaches could learn something from the player's mastery, which would be coaches' own mastery. Observing achievement of a skill/process in players reflects coaches' mastery Can't be just a mention of practice or training, has to suggest learning/growth/development/enhancing of skills.	"We had a football committee meeting after coaching. We spoke about the basic issues and then ended up in quite an inspiring conversation (for me) about the potential future of the club and things we could change and do to help develop it."	1 = present 0 = not present
Appreciation	**REL**	Highlight relates to people. Appreciation of family, friends, relationships with or feedback from others (including athletes). Activity with other people	"Seeing my boys arrive at work and run up to me and give me cuddle,	1 = present 0 = not present

		Highlight shows appreciation for the relationship beyond everyday/normal interactions	when I was coaching in the afternoon"	
Appreciation	**NAT**	Highlight mentions nature. E.g. scenery, weather, animals, sensation of being outdoors. Highlight indicates appreciation of nature, rather than just stating an activity that was done outside.	"Coach on Lake Rotorua and the beautiful scenery and calm water."	1 = present 0 = not present
Appreciation	**CULT**	Highlight relates to culture AND ENTERTAINMENT. Can include watching sport. Appreciation of art, literature, film, TV, reading, entertainment. (can still be every day, eg TV)	"Examining lovely ancient objects at museum."	1 = present 0 = not present
Appreciation	**ACT**	Highlight relates to the participant being active. Includes exercise, the activity of playing sport (as opposed to the result, or appreciation of relationships while playing sport)	"Getting a run in at lunchtime following the team's morning training session."	
Appreciation	**EVACT**	Highlight relates to an everyday activity. Participant has listed a regular/everyday/non-significant activity or event as a highlight Work related activity, coaching or non-coaching, includes day to day, meetings, practices, where no mention of special achievement, mastery of growth. Family dinner = everyday activity, relatedness (appreciation of an everyday activity shared with others). Relaxing = everyday activity e.g. 'lunch with colleagues' = everyday BUT 'going out to lunch with colleagues = special occasion.'	"Baking a cake" "Getting the veges at the market this morning, catching up with some of my running squad and club mates and having a read of the Sunday paper over a coffee later on my way home."	1 = present 0 = not present
Appreciation	**SPECOC**	Highlight relates to a special occasion that doesn't happen every day. E.g. going out for a meal, attending a celebration, marking an event, savouring of special food/drink.	"Glass of champagne with two friends this afternoon"	1 = present 0 = not present
No highlight	**NOHI**	Has completed survey for the day, but either explicitly said there was no highlight, or has left question blank. (note: highlights such as 'day being over', or 'going to bed' should be coded as no	"Hasn't happened yet"	1 = present 0 = not present

		highlight – they do not relate to an event or experience during the day). <mark>Anticipation of future events is not a highlight – doers not relate to something that happened that day.</mark>		179

		DAILY STRESS		
	CODE	**DESCRIPTION**	**EXAMPLE**	
Stress	**NOST**	No stress Has completed survey for today, but either explicitly said no stress, or left question blank. Reflection on stress from previous days does not count as stress for that day, thus should mark NOST as 'yes'. If comment indicates no stress, but then provides details of stress/stressor, then NOST is 'no'. If NOST is 'yes', then code STND, STRMIN and STRMM as 'no' because of the lack of stress.	"Nothing especially stressful today"	1 = no stress 0 = stress reported

Stress	**STND**	Stress – no detail Has said something stressful occurred, but has not provided detail If STND is 'yes', then code STRMIN and STRMM as 'no' because of the lack of details.		1 = present 0 = not present
Stress	**STRMIN**	Minor issue, subjectively stressful to individual, may result in strain, but not major/objectively stressful. Resolvable within a day, or consequences do not extend beyond the day. Consequences confined to the coach, not to other people. If stressor is already removed, but participant still indicated rumination, judge whether it is a minor or major stress based on description of cause of stress and negative emotions (if present, then major stress). Does not have to only pertain to work.	"Last minute change of plans to the work day that made my morning rushed"	1 = present 0 = not present
Stress	**STRMM**	Moderate/major stressor; would appear objectively stressful to outside observer. If comment indicates strong, extreme negative emotions, it is a major stress. Has consequences beyond the day Has consequences negatively impact other people Note – losing a game for a coaching is minor rather than major	"Yes run a tournament for work that was outdoors and I was weather effected and had to be moved indoors 250 people major stress"	1 = present 0 = not present