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**High Performance Leadership:
The Influence of Mindfulness and Reinvestment**

A thesis

submitted in partial fulfilment
of the requirements for the degree

of

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Abstract

In the forever changing national and global markets, the need for high performing leaders is critical, particularly for organisational success. High performance leadership, established in the current study by one's self-reported recall of performance under pressure, as well as actual level of leadership, matters when functioning within highly complex, dynamic, and pressurised environments. These environments, however, can cause leaders to perform poorly, despite having high motivation and incentives for success; a phenomenon sometimes referred to as *choking*.

Drawing on 119 corporate and 63 athletic individuals, the current research set out to (1) assess the role of mindfulness in performance and to examine the role of mindfulness in pressure situations and (2) introduce the notion of *reinvestment*, a psychological concept associated with performance failure under pressure, into Industrial/ Organisational Psychology literature.

Results of the study supported past research examining mindfulness, and reiterated the positive role that mindfulness plays in performance, particularly at high levels of employment; suggesting that individuals who hold high levels of dispositional mindfulness are more likely to reach higher levels of leadership or seniority within employment than those low in mindfulness. Additionally, the results supported past research examining reinvestment, and highlights the negative role that reinvestment plays in performance, with those individuals who have a high predisposition to reinvest when under pressure recalling lower levels of performance, and achieving lower levels of leadership within employment. Only partial support for these relationships were found for the athletic sample.

Moderation analyses indicated that mindfulness and reinvestment appear to function together, for the corporate sample only. Participants reporting high levels of mindfulness and high levels of decision reinvestment (specifically decision rumination) appeared to achieve performance levels that were significantly higher than participants reporting low levels of mindfulness and high levels of decision rumination. This suggests that in the organisational setting, and particularly for leaders, some level of rumination in decision making is beneficial, provided mindfulness is also present. This new finding has been termed *mindful rumination*, and it is argued that, in the corporate setting, engaging in mindful rumination is beneficial to making informed decisions, particularly when under

pressure. This suggests that encouraging mindful rumination may be beneficial to organisational performance, and support performance at high levels of leadership. Alternatively, mindful rumination may be used to encourage career advancement.

Overall, this study explores notions of high performance leadership, which goes above-and-beyond traditional understandings. The current study has successfully introduced notions of reinvestment into organisational life, providing a foundation for future research to explore the mechanisms that underpin performance failure in the corporate setting. Additionally, this study has demonstrated that for high performing leaders, engaging in mindful rumination is beneficial to performance.

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Chapter One: Introduction

Within many aspects of life, one's ability to successfully perform under varying pressure can be hugely important (Laborde et al., 2015). Skill failure, however, sometimes referred to as 'choking' under pressure, is not uncommon, and refers to "... the occurrence of poor performance in spite of high motivation and incentives for success" (Kinrade, Jackson, & Ashford, 2010, p. 312). For the leaders in organisations, high performance is seen as essential, particularly given the context of sustained competitive advantage. For this reason, organisations are continuously seeking to generate leaders who can cope with extensive pressure, yet simultaneously perform to an exceptionally high standard.

In exploring current gaps in high performance leadership literature, the present study makes two main contributions. Firstly, it assesses the role of mindfulness and the conditions in which mindfulness is effective in high performance situations. Secondly, it takes a well-known Sport Psychology concept associated with performance under pressure, *reinvestment*, and introduces it into the Industrial/ Organisational Psychology literature. These contributions are discussed throughout.

High Performance Leadership

In today's competitive and forever changing national and global markets, the need for high performing leaders is critical, as Guttman (2006) acknowledges, "... in today's turbo-charged environment, *high performance* leaders are needed" (p. 18). It has been well recognised that leaders function as the 'change agent' (Waddell, Creed, Cummings, & Worley, 2014), and that leadership involves the ability to encourage and assist both individuals and groups to achieve organisational goals (Yukl, 2012). Leaders are required to make decisions related to "...what needs to be done, establishing networks of people to accomplish the goals, and ensuring that the people, the followers, actually get the job done" (Grimm, 2010, p. 74). Furthermore, leaders do not function within a 'vacuum', but act in highly complex (Harris, 2013) and dynamic environments (e.g., contexts of negotiation, emergency response operations, or crisis management situations) (Dane, 2011). Consequently, their ability to engage in high performance tasks related to conceptual thinking and decision making under pressure is vital. Decision making, however, is an extremely complex behaviour

with potential to result in success or fail, gain or loss, acceptance or disapproval. As Rosenbloom, Schmahmann, and Price (2012) state, “Human lives are propelled forward or pulled backward by decisions that are made on a daily basis in both social and professional settings” (p. 266). Research suggests that all performance requires vital decision-making components, and that the ability to engage in effective decision making when under pressure can differentiate between exceptionally high performers and exceptionally low performers (Kinrade, Jackson, Ashford, & Bishop, 2010).

Understanding what contributes to high performance leadership is of particular importance, given that leaders exercise a vast amount of power and influence (Hackman & Johnson, 2013), which can be hugely instrumental in organisational success or failure. While the evolution of leadership research has been extensive (Gordon & Yukl, 2004; Northouse, 2014; Yukl, 2012), limited research examines the effectiveness of leaders in relation to their cognitive functioning, for example, the mechanisms behind decision making in pressure situations. While there is no doubt that high performance leadership is influenced by particular traits and behavioural patterns, with vast empirical research supporting these theories (see for review Northouse, 2014), there is room for further examination of how cognitive functioning may influence the ability of a leader to be high performing in pressure or evaluative situations (e.g., situations which require decisions to be made quickly).

In the sporting context, Birrer, Röthlin, and Morgan (2012) have described performance decrements in relation to *dysfunctional thinking*, arguing that while dysfunctional thinking in this context is unlikely to reach clinical levels, it can be very unforgiving in the professional sporting environment, and hugely performance relevant (i.e., it may lead to a loss in a competitive situation). In the corporate industry this outcome is likely to be very similar. Decision making at high levels of leadership often does not follow the ‘simple contexts’, which Snowden and Boone (2007) argue are characterised by “... stability and clear cause-and-effect relationships” (p. 2), which make the decision making process relatively easy and straight-forward. Instead, decision making at high levels of leadership is often complex, characterised by several correct response possibilities (Snowden & Boone, 2007).

Political and business leaders are constantly under pressure and required to make decisions in highly complex environments. Additionally, these leaders often

face the media, so the ability to perform in such circumstances is essential to their success as well as to ensuring that their personal integrity is retained. For example, New Zealand's multinational dairy co-operative, *Fonterra*, is often pressured by campaigners and the media to make fundamental decisions, which result in either success or failure. One recent example is the pressure put on Fonterra Chairman, John Wilson, to cease using coal in the milk plants (NZ Herald, 2015). A letter from campaigners was sent to Wilson prior to the Fonterra board meeting in late November 2015, in the hope that a decision would be made to stop the use of coal in light of using wood waste instead (Action Station, 2015). In these contexts, leaders are placed in extremely dynamic and pressurised environments, which require them to make vital decisions, and it is likely that their ability to cope with the pressure when making a decision that will play a huge part in the nature of the outcome.

As briefly mentioned above, research has tended to focus on the myriad of behaviours which impact on leader effectiveness (Gordon & Yukl, 2004), often associated with particular behaviour styles. Mumford, Zaccaro, Harding, Jacobs, and Fleishman (2000), however, highlight how "... leadership can be framed not in terms of specific behaviors, but instead in terms of the capabilities, knowledge, and skills that make effective leadership possible" (p. 12). As an example, to be an effective leader relies on a willingness and ability to interact with others, in combination with engaging in effective decision making. In evaluative or pressure situations, the performance of leaders in relation to exercising effective influence can be significantly impacted if there is an inability to engage in effective decision making or, alternatively, if there is loss of focus on task relevant cues or cognitive distraction from the task at hand (Dane, 2011).

Importantly, the current study explores high performance leadership from a somewhat unique perspective. Where traditional studies may have explored or defined high performance in relation to key performance indicators (KPIs) (Brooks, 2010), the current study defines high performance from both a subjective and an objective standpoint. Participants in the current study were asked to recall their personal perceptions of their performance ability under pressure (subjective measure) as well as to indicate their actual level of performance (objective measure). Level of performance was determined by position of seniority within the corporate sector (i.e., Director, CEO, Manager, General Employee, etc) or

level of performance within the sporting sector (i.e., International, National, Non-competitive, etc).

In understanding the significance of maintaining high performance levels in pressure situations, the current study's variables will be further discussed as per the theoretical model (Figure 1-4, p. 20-21).

Theory of Mindfulness

The concept of mindfulness dates back centuries, with original documentation suggesting that mindfulness has its roots in Buddhist traditions and psychology (Brown & Ryan, 2003; Brown, Ryan, & Creswell, 2007). Translated from the language of Pali, and the word *sati*, mindfulness is acknowledged to represent *awareness* and *attention* (Brown et al., 2007).

Awareness refers to the idea that one can be fully and consciously aware of both inner and outer experiences, such as thoughts, emotions, sensations (including the five physical senses), actions, or surroundings (Brown & Ryan, 2004; Brown et al., 2007), before acting on what is occurring. Attention occurs when one of the experiences or stimuli in conscious awareness is strong enough for the mind to “take notice” of it (Brown & Ryan, 2004; Brown et al., 2007).

As a form of consciousness, Brown et al. (2007) acknowledge that mindfulness “... signifies presence of mind” (p. 212), defining the concept as “... *receptive attention to and awareness of present events and experience*” (p. 212). As the concept of mindfulness has moved beyond its ancient traditions towards modern organisations, the original meaning of mindfulness has continued to develop and expand, with mental qualities (i.e., nonjudgment and acceptance) finding their way into new definitions. As Kabat-Zinn (2003) states, mindfulness can be defined as “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (p. 145).

While the notion of engaging in mindfulness is not new, with research suggesting that attention and awareness are normal human functions, Brown and Ryan (2003) suggest that mindfulness highlights a more ‘enhanced’ or stronger sense of attention and awareness that goes beyond normal function. Individuals, however, very rarely engage in this form of enhanced attention and awareness. As an example, Brown and Ryan (2003) highlight how:

... rumination, absorption in the past, or fantasies and anxieties about the future can pull one away from what is taking place in the present. Awareness or attention can also be divided, such as when people are occupied with multiple tasks or preoccupied with concerns that detract from the quality of engagement with what is focally present. Mindfulness is also compromised when individuals behave compulsively or automatically, without awareness of or attention to one's behaviour (p. 823).

Furthermore, Brown et al. (2007) describe how often the experiences or stimuli that are brought to one's attention are only in 'focal attention' for a very short period of time before a reaction is made through cognitive and emotional processes; where one makes a judgement of the stimuli or experience and then reacts to it. While it is suggested that such processes can be beneficial, Brown et al. (2007) argue that this form of processing results in objects and experiences being infrequently examined impartially "... as they truly are, but rather through the filters of self-centered thought and prior conditioning, thereby running the risk of furnishing superficial, incomplete, or distorted pictures of reality" (p. 212). For this reason, Brown et al. (2007) suggest that mindfulness can be beneficial in that it allows immediate connection with experiences as they happen - this removes the discriminative, categorical, and habitual thoughts which normally occur, and allows the consciousness to take "... on a clarity and freshness that permits more flexible, more objectively informed psychological and behavioral responses" (p. 212).

Mindfulness in the workplace. While notions of mindfulness have traditionally been studied within the clinical setting (Choi & Leroy, 2015), the application of mindfulness within a range of different settings and populations is rapidly growing. Within the organisational context, mindfulness can be considered to be within its infancy (Dane, 2011; Dane & Brummel, 2013), however, a rapidly growing area of literature has been developed which illustrates an array of positive benefits linked with mindfulness and workplace functioning. Examples of positive outcomes include enhanced work engagement (Leroy, Anseel, Dimitrova, and Sels, 2013), enhanced work-family balance (Allen & Kiburz, 2012), enhanced job satisfaction (Hülshager, Alberts, Feinholdt, and Lang, 2013), reduced turnover (Dane & Brummel, 2013), reduced emotional

exhaustion (Hülshager et al. 2013), reduced rumination (Glomb, Duffy, Bono, & Yang, 2011), and improved social relationships, resilience, and performance (Glomb et al., 2011). Additionally, other research has demonstrated mindfulness to act as a mechanism of ‘psychological defense’, helping to improve organisational leaders’ overall psychological well-being (Roche, Haar, & Luthans, 2014). The following section aims to explore the different aspects of mindfulness within the workplace, before finally linking this research to the current study’s hypotheses.

Mindfulness, work engagement, and work-family balance. In exploring the links between mindfulness and work engagement, Leroy et al. (2013) found that mindfulness practice supports work engagement. Work engagement is defined as “... a positive, fulfilling work related state of mind that is characterized by vigour, dedication, and absorption” (Schaufeli, Salanova, González-Romá & Bakker, 2002, p. 74). It is acknowledged that *vigour* is characterised by high levels of energy as well as ‘mental resilience’ while working, *dedication* is characterised by high levels of enthusiasm and pride, with a strong sense of significance and inspiration, while *absorption* is characterised by high levels of concentration and being completely immersed and preoccupied with work tasks (Schaufeli et al., 2002). Leroy et al. (2013) suggested that within the work setting, “work engagement is dependent on people investing their “true self” in the work” (p. 241), therefore, by encouraging an individual’s ‘authentic functioning’, mindfulness was found to support/ promote work engagement.

Work-life balance is defined as “... an overall appraisal regarding one’s effectiveness and satisfaction with work and family life” (Allen & Kiburz, 2012, p. 373). In exploring the relationships between mindfulness and work-family balance, Allen and Kiburz (2012) found that participants who reported greater levels of mindfulness also reported greater work-family balance. It was suggested that this provided support for the argument that “... the enhanced self-regulation that comes with mindfulness may enable individuals to experience satisfaction and effectiveness within each role” (p. 376). In other words, those individuals who had greater mindfulness experienced greater levels of satisfaction and effectiveness within both their work and life domains.

Mindfulness, job satisfaction, and turnover. In briefly exploring the links between mindfulness and job satisfaction, Hülshager et al. (2013) examined correlations between mindfulness and levels of job satisfaction in two different

studies using a sample of employees. The results yielded significant support for mindfulness, indicating that for the participants who engaged in a mindfulness intervention, their levels of job satisfaction improved. Furthermore, Dane and Brummel (2013) conducted a study to examine how workplace mindfulness related to employee turnover. The authors found, among a sample of restaurant servers, a negative relationship between mindfulness and turnover intentions, indicating that those who were higher in mindfulness were less likely to report intentions to quit. This finding was explained on the basis of *dynamic work environments*, which are argued to be associated with significant levels of emotional arousal as well as stress; ultimately encountered due to pressure (i.e., time) and the unpredictable nature of these kinds of environments. It was reported that these sorts of pressures, over time, become unbearable for employees and lead to intentions to quit (Dane & Brummel, 2013). This links to notions of high performance, where leaders often function within dynamic environments which are highly stressful. Furthermore, in line with precursors to turnover, Hülshager et al. (2013) examined correlations between mindfulness and emotional exhaustion in two different studies using a sample of employees. The results yielded significant support for mindfulness, indicating that for the participants who engaged in a mindfulness intervention, their levels of emotional exhaustion decreased.

Mindfulness and psychological well-being. In a study examining leaders, it was suggested that organisational leaders' mental well-being was negatively affected by the psychological demands placed on them for successful performance in the forever demanding and competitive global economy (Roche et al., 2014). Roche et al. (2014) found that in three samples of organisational leaders (CEOs, presidents, top-junior managers), those with high levels of mindfulness showed negative correlations with dysfunctional outcomes such as anxiety, burnout, and depression. As a mechanism of 'psychological defense', Roche et al. (2014) suggested that mindfulness may be used to benefit leaders' psychological well-being.

In further exploring psychological well-being, in clinical and nonclinical populations mindfulness has been used to highlight reductions in rumination. Rumination refers to a process whereby there is repetitive thought given to present, past, or future events. In the clinical setting, it is acknowledged that individuals with a 'ruminative response style' tend to continuously think about the

negative emotions they are experiencing (i.e., “I just can’t concentrate” or “I just feel so lousy”) as well as worry about what these negative emotions mean (i.e., “Will I ever get over this”) (Nolen-Hoeksema, 2000). The process of ruminating has been identified as having negative psychological outcomes, with consequences such as increased anxiety and depression being common (Nolen-Hoeksema, 2000). Within the workplace, Glomb et al. (2011) suggest that in situations where individuals are faced with stressful events, a mindful orientation will reduce the likeliness of these individuals engaging in ruminative thought patterns. Consequently, Glomb et al. (2011) argue that

... reduction in rumination resulting from mindfulness will have broad ranging effects on employees’ performance and well-being, via improved confidence, better problem solving, more effective use of social support mechanisms, and better concentration (p. 130).

Furthermore, it is suggested that those individuals who are highly mindful, such that there is a reduction in ruminative thought when faced with stress inducing situations, this will lead to greater recovery from events or situations within the workplace environment which are identified as negative in nature. For high performing leaders, this may be the ability to continually perform at a high standard, regardless of workplace conflict or pressures to perform and, therefore, not be hindered by repetitive thought patterns, such as those related to rumination.

Mindfulness, attention, and emotion regulation. A recent meta-analysis examining mindfulness within the workplace highlights how the nature of mindfulness is likely to be beneficial within a variety of different human functions (i.e., attention, emotion regulation, performance) (Good et al. 2016); important for organisational success. As an example, Good et al. (2016) acknowledge research which shows mindfulness to be linked with greater attentional stability, such that individuals pay more attention to the task at hand and are less distracted by things such as the ‘mind wandering’. This ability to stay focused is essential at levels of high performance, where leaders may be required to stay focused for long periods of time.

For leaders working in dynamic environments, it is important for them to be able to control their emotions and behaviours in ways which are constructive. It

is suggested that those individuals who are high in mindfulness "... observe their thoughts and feelings without reacting to them in maladaptive ways and therefore are better able to behave constructively even when unpleasant thoughts and feelings are present" (Bowlin & Baer, 2012, p. 411).

Mindfulness and performance. In examining how mindfulness may influence work performance, Good et al. (2016) argue that empirical studies have illustrated mindfulness to impact on performance in a variety of different ways. As examples, Good et al. (2016) highlight that mindfulness improves performance levels, reduces performance variability (i.e., discrepancies between excellent and poor performance), buffers performance in disruptive or stressful situations, and finally, influences goals, goal-directed behaviour, as well as motivation. It is suggested that the attentional qualities obtained from being mindful are a key contributor to the enhanced performance. Good et al. (2016) state that "through effective control and stability of attention to current, task-relevant information, individuals should generally exhibit better task performance" (p. 123), even in demanding situations. Furthermore, in examining how mindfulness buffers performance in disruptive or stressful situations, it is suggested that mindfulness increases cognitive capacity by enabling a prolonged engagement with relevant tasks or performance needs. This increased cognitive capacity, therefore, suggests that mindful individuals have greater cognitive resources available to them which they may be able to use when faced with situations of distraction or stress (Good et al., 2016).

In line with this, Dane and Brummel (2013) examined how workplace mindfulness related to job performance within dynamic work environments (environments which require individuals/ employees to make several interdependent decisions in real time). The authors found, among a sample of restaurant servers, a positive relationship between mindfulness and job performance/ decision making. It was suggested that the results link directly to the qualities of attention that are characterised by being mindful, ultimately helping to prevent the mind from 'wandering' in decision making. Dane and Brummel (2013) argue that

In light of the mind's tendency to wander, we view mindfulness (in the workplace and elsewhere) as a remarkable feat: situating the mind in the present moment time despite psychological pressures to the contrary. In

performing this mental feat in a dynamic work environment, individuals attend to a number of stimuli and events and, as a result, perform effectively (p. 119).

Consequently, it is suggested that mindfulness aids effective decision making within dynamic environments. Dane and Brummel (2013) suggest that in dynamic environments, employees are required to focus on a variety of events where at any point in time one of the events may provide essential information; this is critical to informing employees' decisions regarding moving forward. To date, no research has examined this within high performance leadership or sporting contexts.

In further examining the process of decision making as related to high performance, EnginDeniz, Ari, Akdeniz, and Özteke (2015) explored how mindfulness may influence decision making. The authors explored whether mindfulness predicted decision self-esteem (e.g., competence and self-esteem as a decision maker) and the styles used for making a decision (e.g., the way we perceive and understand situations). The results of the study showed that there was a negative relationship between mindfulness and elements of the decision making style, *defensive avoidance* (for a review of decision making styles see Mann, Burnett, Radford, & Ford, 1997). Defensive avoidance suggests that, "the decision maker escapes conflict by procrastinating, shifting responsibility to someone else, or constructing wishful rationalizations to bolster the least objectionable alternative" (Mann et al., 1997, p. 2). Specifically, EnginDeniz et al. (2015) found a negative relationship between mindfulness and *buck passing* (e.g., leaving decisions up to another individual) and *procrastination* (e.g., putting off making decisions). Buck passing involves leaving decisions up to other individuals and is characterised by low levels of self-regulation, low self-esteem, and failure to take initiative. Procrastination is characterised by attending to decision making tasks in the future, as opposed to in the moment (EnginDeniz et al. (2015). This study alludes to the benefits of mindfulness in terms of its association with decision making styles, with the suggestion that those individuals with greater levels of mindfulness have far better decision making styles than those individuals low in mindfulness. Given the importance of decision making in high performance leadership, this research supports the notion that individuals low in mindfulness may have low levels of decision self-esteem and be unable to

use their initiative when seeking solutions to problems, and thus may result in lower levels of performance within the workplace.

In a different study, Weinstein, Brown, and Ryan (2009) found, in a sample of undergraduate students, that those who were more mindful perceived lower levels of stress in direct response to an ‘induced social threat’ (social evaluation), and showed greater task performance, suggesting that mindfulness is beneficial for reducing anxiety and stress levels in evaluative situations and can lead to greater performance. This links back to the work of Good et al. (2016), reiterating that mindfulness buffers performance in stressful situations. For organisational leaders, it is expected that they will be required to perform within highly stressful contexts, and thus illustrates the important nature of mindfulness in maintaining high levels of performance.

Finally, in examining ‘prosocial behaviours’ it has been suggested that mindfulness has the potential to encourage effective communication as “... it permits an open, creative, and flexible processing of information” (Leary & Tate, 2007, p. 252), which may be seen as essential for leaders who rely on effective communication with their followers. Consequently, this may suggest that those who are better able to communicate with their followers are more likely to perform better in the workplace.

Mindfulness and the current study. Despite a lack of research examining the influence of mindfulness in direct relation to performance under pressure, with the closest study being that of Weinstein et al. (2009) (as described above) and the exploration of mindfulness reducing stress and anxiety in evaluative situations, most of the other studies (as mentioned above) have found positive correlations alluding to the benefits of mindfulness.

Given that this research has provided strong support for the role of mindfulness in enhancing positive outcomes such as those associated with greater work outcomes (e.g., performance), as well as reducing dysfunctional outcomes such as those related to rumination, the following hypotheses have been formed:

Hypothesis 1a: Mindfulness will be positively associated with subjective recall of performance under pressure for the corporate sample.

Hypothesis 2a: Mindfulness will be positively associated with performance level for the corporate sample.

Mindfulness in sport performance. Within the sporting context, failure under pressure has been a topic of constant review (Cox, 2012). Despite motivation and incentives for success, it is not uncommon to see high performing athletes fail under pressure, when their performance should otherwise be optimal (Kinrade, Jackson, Ashford, et al., 2010). Psychological skills training (PST), which primarily stems from cognitive-behavioural theories (Birrer et al., 2012), has been widely used to combat skill failure under pressure, and involves techniques such as thought-stopping, self-talk, goal setting, and imagery (Cox, 2012; De Petrillo, Kaufman, Glass, & Arnkoff, 2009). Recent reviews of these techniques, however, have questioned their ability to successfully improve athlete performance. De Petrillo et al. (2009) indicated that, most often, these techniques involve increasing athletes' awareness of the adverse cognitions and emotions which are experienced and then focusing on manipulating them, by controlling or eliminating them. Research suggests, however, that these mechanisms are not always effective, and that:

... by consciously targeting and attempting to change or erase negative cognitions, a greater awareness will be brought to these cognitions, which in turn may increase their frequency, leading to even greater distraction and a possible decline in performance (De Petrillo et al., 2009, p. 358).

Recently, research has turned to examine the benefits of mindfulness-based interventions for improving athlete performance (Bernier, Thienot, Cordon, & Fournier, 2009; Birrer et al., 2012). The belief around the success of mindfulness in enhancing athletic performance stems from its overlap with notions of "flow" (Thompson, Kaufman, De Petrillo, Glass, & Arnkoff, 2011), which is understood to facilitate peak performance, and has been widely used within sport psychology literature (Cox, 2012). Flow is defined as "... a state of consciousness in which a person is completely absorbed in his or her actions and experiences a unity of the mind and body" (Thompson et al., 2011, p. 100). As flow and mindfulness share a common feature, *present experience*, this warrants support for mindfulness in enhancing performance (Thompson et al., 2011).

In contrast to previous techniques for enhancing performance as described above, it is suggested that the use of mindfulness, as an approach, focuses on

teaching "... athletes to accept their cognitions, emotions, and sensations and to commit themselves to action, rather than fighting against negative thoughts and unpleasant emotions" (Bernier et al., 2009, p. 330). This notion is also supported by Birrer et al. (2012) who have advocated that outcomes of mindfulness in relation to acceptance, non-judgemental, openness, self-respect, and non-reactivity, encourage athletes to accept their performance, regardless of whether it is unexpected poor performance, or unexpected good performance

In line with notions of mindfulness, Olympic and World European Champion, Alexander Popov, a professional freestyle swimmer, has been known to acknowledge the importance of present moment awareness. Prior to his success at the World Championships in 2003, Popov was noted as stating "Who thinks of winning loses" (as cited in Birrer et al., 2012, p. 242), acknowledging that focusing on winning would act as a distraction from his performance in the 'here and now' and prevent his ability to engage in automatic processes (Birrer et al., 2012).

Current studies examining mindfulness, particularly the outcome of mindfulness interventions, have been conducted using student athletes (Aherne, Moran, & Lonsdale, 2011; Kee & Wang, 2008) as well as professional athletes in sports such as running (De Petrillo et al., 2009), swimming (Bernier et al., 2009), archery (Kaufman, Glass, & Arnkoff, 2009), golf (Kaufman et al., 2009), and diving (Schwanhausser, 2009). Majority of these studies showed support for the use of mindfulness as a form of intervention for improving athlete performance. In returning to the notion of acceptance, it has been suggested that the use of mindfulness promotes *acceptance*. Acceptance is said to occur when athletes avoid changing their cognitions (i.e., negative thoughts regarding performance) and instead accept them in a non-judgemental manner (De Petrillo et al., 2009, p. 359). Practice of acceptance through mindfulness has been suggested as a prevention method for processes such as reinvestment (discussed next); subsequently enhancing performance (Birrer et al., 2012). Based on this knowledge, the following hypotheses have been formed:

Hypothesis 1b: Mindfulness will be positively associated with subjective recall of performance under pressure for the athletic sample.

Hypothesis 2b: Mindfulness will be positively associated with performance level for the athletic sample.

Decision Making under Pressure and Reinvestment

As mentioned previously, decision making is a highly complex behaviour with the potential to result in success or failure, gain or loss, acceptance or disapproval. For leaders, then, the ability to engage in effective decision making, particularly when in pressure situations is extremely vital. Some leaders, however, have been known to ‘buckle’ under the pressure and fail to make effective decisions, resulting in severe repercussions, particularly for organisational success. This failure to engage in effective decision making can be understood in relation to the Theory of Reinvestment.

The Theory of Reinvestment, a widely recognised theory of cognitive process, illustrates how pressure, in combination with other contingencies, can result in individuals attempting to consciously control their behaviour. In the sporting sector, reinvestment has been used to show how performance can be influenced when individuals attempt to consciously control automated motor processes by using declarative knowledge (i.e., factual knowledge about how to perform motor actions) (Masters, 1992; Masters, Eves, & Maxwell, 2005; Masters & Maxwell, 2008). In general, the theory relates to focused attention ‘inward’ (Wilson, Chattington, Marple-Horvat, & Smith, 2007) and reflects the idea that “... performance pressure increases self-awareness about performing correctly, causing individuals to try to consciously control normally automatic processes and behaviors” (Kinrade, Jackson, & Ashford, 2015, p. 11). As an example, in the corporate sector, a business leader giving a presentation may become aware of the way in which he or she is projecting his/her voice to the audience, standing, or using hand gestures. This awareness (or inward focused attention) may cause them to then try and alter how they present to fit with their beliefs about the ‘correct’ way. It is acknowledged that it is this process of ‘step-by-step’ attention to skill performance which can result in performance failure under pressure, or ‘choking’ (Wilson et al., 2007).

It is widely accepted that sound decision making within competitive or dynamic environments is vital, and that one’s decision making processes under pressure can potentially alter performance (Kinrade, Jackson, Ashford, et al., 2010). In performance literature, Kinrade, Jackson, Ashford, et al. (2010) found

that there was a lack of research which examined the correlations between the notion of reinvestment and decision-making, which they highlight as being essential to high performance. In acknowledging the gap in the research between decision making and impaired performance related to reinvestment, Kinrade et al. (2015) developed the Decision Specific Reinvestment Scale (DSRS) as a means to "... measure the propensity for reinvesting explicit knowledge in decision-making tasks" (p. 12), extending the theory beyond just reinvestment of motor movements (i.e., the physical movements of the body). The DSRS was designed to ultimately help predict which individuals would be more likely to engage in poor decision making in high pressure situations. The measure can be separated into two separate dimensions or factors. The first factor, *Decision Reinvestment*, measures an individual's propensity to consciously monitor the processes that occur prior to making a decision, such as weighing up the pros and cons of alternative outcomes. The second factor, *Decision Rumination*, measures an individual's tendency to think about bad decisions or ruminate on decisions made in the past. Kinrade, Jackson, Ashford, et al. (2010) acknowledge that rumination refers to "... a thought process related to failure to achieve and typically involves repetitive thoughts about past events or current moods states" (p. 1131). Additionally, Masters and Maxwell (2008) suggest that rumination refers to "... a unique form of self-focus in which thoughts cycle continuously around a common theme even when the stimulus for the thoughts is not present" (p. 160).

While research exploring decision reinvestment in the organisational context has not been done to-date, current studies in the sporting arena suggest that those individuals who have a higher propensity to engage in decision reinvestment in pressure situations are more likely to perform worse (Laborde, Dosseville, & Kinrade, 2014; Poolton, Siu, & Masters, 2011), thus leading to the following hypotheses:

Hypothesis 3a: Decision reinvestment will be negatively associated with subjective recall of performance under pressure for the corporate sample.

Hypothesis 3b: Decision reinvestment will be negatively associated with subjective recall of performance under pressure for the athletic sample.

Hypothesis 4a: Decision reinvestment will be negatively associated with performance level for the corporate sample.

Hypothesis 4b: Decision reinvestment will be negatively associated with performance level for the athletic sample.

Movement Reinvestment

In continuing with the theory of reinvestment, but in examining its functioning in relation to physical movement, Masters and Maxwell (2004) conceptualised movement reinvestment as the “manipulation of conscious, explicit, rule based knowledge by working memory, to control the mechanics of one’s movements during motor output” (p. 208). Masters et al. (2005) developed the Movement-Specific Reinvestment Scale (MSRS), which the Decision Specific Reinvestment Scale is based on, and measures two factors: (1) the extent to which individuals are conscious of their movement in evaluative situations (Movement Self-Consciousness) as well as their likeliness to try and consciously control or ‘monitor’ the actual mechanics of their physical movements (Conscious Motor Processing) (Masters et al., 2005). For corporate leaders, this may be the extent to which they are conscious of how they are moving while giving a business presentation or may reflect notions of controlling speech or body movement (i.e., hand gestures) while presenting. For athletes this may be the extent to which they are conscious of how they are moving in a competitive situation (i.e., sports event). Those who score high in MSRS are considered to be highly self-conscious with respect to the way in which they move, with a strong desire to impress those who may be evaluating their movements.

Masters (1992) suggested that individuals who learnt to perform a skill using explicit forms of knowledge, such as through following sets of rules, were more likely to engage in reinvestment and suffer performance failure during pressure situations. This is because these individuals would attempt to consciously control their movements by applying the explicit rules they had used in the early stages of learning, which then interfered with the automaticity of the skill (e.g., the skill became less automatic in nature). In contrast, Masters (1992) suggested that those who learnt to perform a skill implicitly (i.e., learning to ride a bike without explicit instructions or rules or a high level of conscious hypothesis testing; or learning to give a good presentation without following rules of ‘good’

presentation, rather learning good skills through observation) were less likely to experience performance failure. As Masters (1992) states:

... if, in passing from novice to expert, or unpractised to practised, explicit learning can be minimized, the performer will have less conscious knowledge of the rules for execution of the skill, and will be less able to reinvest his or her knowledge in time of stress (p. 345).

Support for Masters (1992) hypothesis was achieved in his research using 40 golf putting novices. The study highlighted that those participants who learnt the golf putting skill implicitly showed no changes in performance across the stressful situation. Participants who learnt the skill explicitly (via rules or instructions), however, showed decreases in their performance in the stressful situation. Masters (1992) concluded that development of a high performing athlete with much explicit instruction enhances the likelihood that the individual will not have the ability to cope with the pressures that occur in evaluative situations (i.e., elite athletes performing in the world arena).

Within corporate leadership, this may be similar, in that those leaders who, for example, develop skills or techniques for presenting at business meetings or for public speaking (i.e., situations which are likely to be stressful) through explicit instruction or rules, may fail to perform well when under pressure in these situations. In other words, those leaders who learn to perform or present based on specific instructions or follow particular rules when presenting (i.e., do not move hands, stand with feet together, use eye-contact, talk at a steady pace), may, when in pressure situations, have a greater likelihood of 'choking' or performing poorly as they try to consciously control their movements. This process of consciously controlling movements prevents these movements from occurring normally or automatically. As an example, little thought is often given to the way in which our hands move when presenting to an audience, these movements usually occur automatically. If we are high on reinvestment, however, and we become aware of the way in which our hands are moving, more thought is given to these movements and we may then try and alter the way our hands are moving.

While research within the corporate and athletic sectors has not yet explored the notion of movement reinvestment with notions of self-recall of performance under pressure (subjective measure) and actual performance level

(objective measure), current literature does indicate that those individuals with a higher propensity to reinvest will perform poorly when in pressure situations. For this reason it is suggested that those individuals who have a greater likelihood to reinvest will have low self-recall of their performance and, additionally, perform at lower levels, leading to the following hypotheses:

Hypothesis 5a: Movement reinvestment will be negatively associated with subjective recall of performance under pressure for the corporate sample.

Hypothesis 5b: Movement reinvestment will be negatively associated with subjective recall of performance under pressure for the athletic sample.

Hypothesis 6a: Movement reinvestment will be negatively associated with performance level for the corporate sample.

Hypothesis 6b: Movement reinvestment will be negatively associated with performance level for the athletic sample.

Conditions of Mindfulness

Based on the past research into mindfulness and reinvestment, the current study hypothesises that these two variables will have a complex relationship. To date, little research has examined the conditions where mindfulness is more (or less) effective, particularly in performance settings. Current literature, as highlighted above, suggests mindfulness plays a positive role in performance, for example enhances the capacity to make effective decisions in pressure situations. This is in contrast to reinvestment which plays a negative role in performance. In other words, mindfulness helps to improve and enhance performance, while reinvestment, particularly in those individuals with a greater propensity to reinvest when in pressure situations, is likely to worsen performance. For this reason, it is hypothesised that high levels of mindfulness will lead to high levels of performance at both a subjective and an objective level (self-recall of performance under pressure and actual performance level, respectively). Alternatively, this relationship will be moderated by levels of reinvestment, such that when

reinvestment is present, this will moderate the relationship between mindfulness and subjective recall of performance under pressure and performance level. Additionally, these hypotheses are supported by the current research which suggests that mindfulness may prevent the trigger for reinvestment to occur (Birrer et al., 2012). As mentioned previously, Birrer et al. (2012) have advocated that outcomes of mindfulness related to acceptance, non-judgemental, openness, self-respect, and non-reactivity encourage athletes to accept their performance, regardless of whether it is unexpected poor performance, or unexpected good performance. It is argued that when there is this acceptance, which is guided by mindfulness, then these individuals are less likely to engage in the reinvestment process (i.e., conscious control of their movements) as there is no interruption to the automatic nature of their performance. Alternatively, as outlined above, mindfulness works against notions of automaticity, as mindfulness focuses on awareness and attention.

Given that these are new relationships being tested, and the complexity of the associations, no *a priori* assumptions regarding the direction of the relationships have been stated.

Hypothesis 7a: Decision reinvestment will moderate the relationship between mindfulness and subjective recall of performance under pressure for the corporate sample.

Hypothesis 7b: Decision reinvestment will moderate the relationship between mindfulness and subjective recall of performance under pressure for the athletic sample.

Hypothesis 8a: Decision reinvestment will moderate the relationship between mindfulness and performance level for the corporate sample.

Hypothesis 8b: Decision reinvestment will moderate the relationship between mindfulness and performance level for the athletic sample.

Hypothesis 9a: Movement reinvestment will moderate the relationship between mindfulness and subjective recall of performance under pressure for the corporate sample.

Hypothesis 9b: Movement reinvestment will moderate the relationship between mindfulness and subjective recall of performance under pressure for the athletic sample.

Hypothesis 10a: Movement reinvestment will moderate the relationship between mindfulness and performance level for the corporate sample.

Hypothesis 10b: Movement reinvestment will moderate the relationship between mindfulness and performance level for the athletic sample.

Theoretical Model

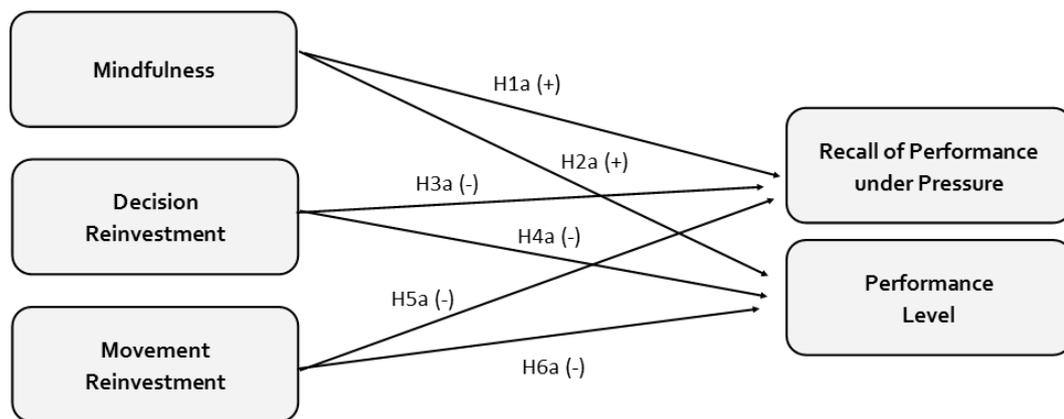


Figure 1. Theoretical framework of the research model with the hypothesised directions of relationships between variables for the corporate sample.

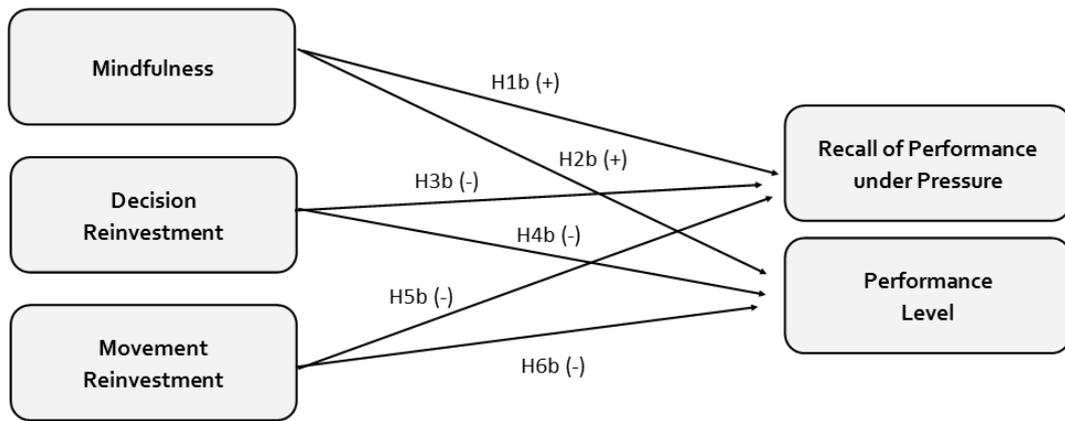


Figure 2. Theoretical framework of the research model with the hypothesised directions of relationships between variables for the athletic sample.

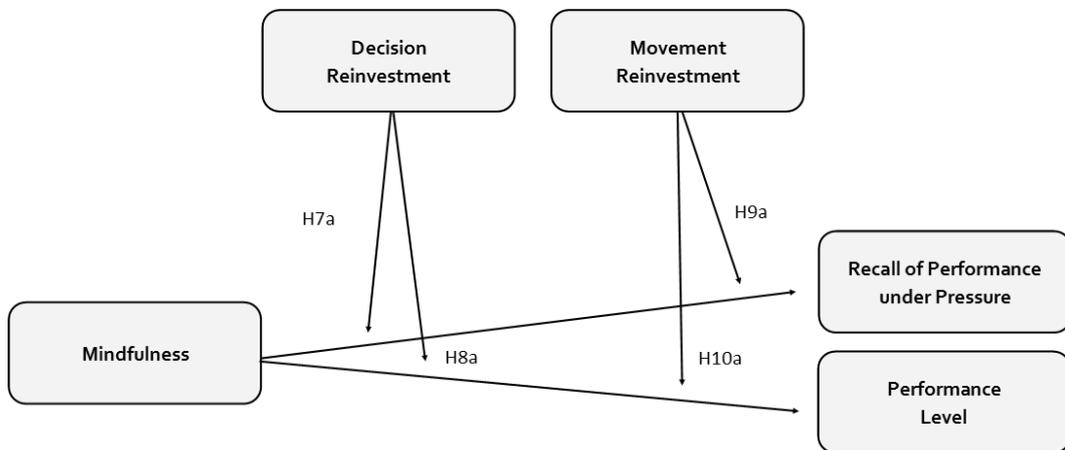


Figure 3. Theoretical framework of the research model for the moderating relationships between variables for corporate sample.

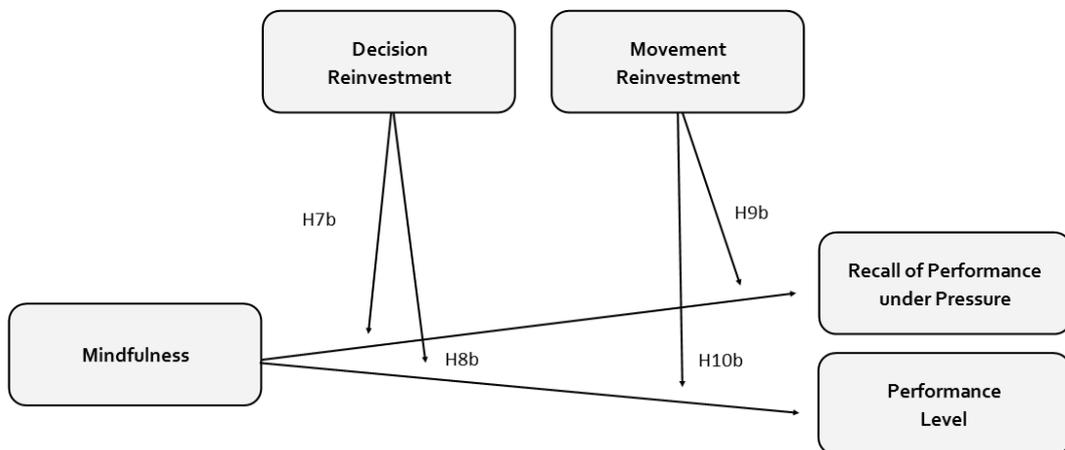


Figure 4. Theoretical framework of the research model for the moderating relationships between variables for athletic sample.

Summary of Hypotheses

Hypothesis 1a: Mindfulness will be positively associated with subjective recall of performance under pressure for the corporate sample.

Hypothesis 2a: Mindfulness will be positively associated with performance level for the corporate sample.

Hypothesis 1b: Mindfulness will be positively associated with subjective recall of performance under pressure for the athletic sample.

Hypothesis 2b: Mindfulness will be positively associated with performance level for the athletic sample.

Hypothesis 3a: Decision reinvestment will be negatively associated with subjective recall of performance under pressure for the corporate sample.

Hypothesis 3b: Decision reinvestment will be negatively associated with subjective recall of performance under pressure for the athletic sample.

Hypothesis 4a: Decision reinvestment will be negatively associated with performance level for the corporate sample.

Hypothesis 4b: Decision reinvestment will be negatively associated with performance level for the athletic sample.

Hypothesis 5a: Movement reinvestment will be negatively associated with subjective recall of performance under pressure for the corporate sample.

Hypothesis 5b: Movement reinvestment will be negatively associated with subjective recall of performance under pressure for the athletic sample.

Hypothesis 6a: Movement reinvestment will be negatively associated with performance level for the corporate sample.

Hypothesis 6b: Movement reinvestment will be negatively associated with performance level for the athletic sample.

Hypothesis 7a: Decision reinvestment will moderate the relationship between mindfulness and subjective recall of performance under pressure for the corporate sample.

Hypothesis 7b: Decision reinvestment will moderate the relationship between mindfulness and subjective recall of performance under pressure for the athletic sample.

Hypothesis 8a: Decision reinvestment will moderate the relationship between mindfulness and performance level for the corporate sample.

Hypothesis 8b: Decision reinvestment will moderate the relationship between mindfulness and performance level for the athletic sample.

Hypothesis 9a: Movement reinvestment will moderate the relationship between mindfulness and subjective recall of performance under pressure for the corporate sample.

Hypothesis 9b: Movement reinvestment will moderate the relationship between mindfulness and subjective recall of performance under pressure for the athletic sample.

Hypothesis 10a: Movement reinvestment will moderate the relationship between mindfulness and performance level for the corporate sample.

Hypothesis 10b: Movement reinvestment will moderate the relationship between mindfulness and performance level for the athletic sample.

Chapter Two: Method

The present study was granted approval by the Psychology Research and Ethics Committee, School of Psychology, University of Waikato. The study was cross-sectional in nature and involved the use of a self-report questionnaire (Appendix A), which was distributed electronically via the survey software *Qualtrics*. This survey was sent to individuals from interest faculties within the University of Waikato, to University of Waikato alumni, and volunteer professionals or athletes. Due to the nature of the study, signed consent was not required from participants; however, informed consent was implied on participation and submission of results. The study was completely confidential and there were no questions within the study that could be used to identify a single participant.

Participants

Two hundred and twenty-nine individuals participated in this study. Forty seven participants, however, failed to complete 50 percent or more of the entire questionnaire or individual scales and so were subsequently removed from the final analysis to preserve internal validity (McKnight, McKnight, Sidani, & Figueredo, 2007); leaving 182 participants. The sample was divided into two separate groups for purposes of analysis, with 63 athletic participants (34.6%); comprising of sports athletes (i.e., contact and non-contact sports) and arts athletes (i.e., dance and music performers), and 119 corporate participants (65.4%). Each sample was formed using a ranking system. Participants were ranked based on their level of corporate leadership and athletic participation, and then allocated to their respective categories depending on the category of highest rank. Those participants who had equal corporate and athletic performance level were assigned to a group using Systematic Assignment (Carter & Lubinsky, 2015).

Procedure

Participant recruitment was carried out via several methods. Largely, participants were recruited via email contact, social media sites, and flyers. A range of organisations were emailed and invited to support participant recruitment. The email sent out detailed the research purposes, invited the organisation to recruit participants from their organisation, and provided the

electronic link to participate in the research (Appendix B). Social media sites including LinkedIn and Facebook were used to circulate a brief description of the research project and the electronic link to the questionnaire (see Appendix C for the list of groups and pages distributed to). Flyers were distributed around interest faculties across the University of Waikato campus, specifically within the Management School and the Sport and Leisure Department. Additionally, individuals were also directly emailed with the research information if they were identified as potentially valuable participants. In light of some participants suggesting other individuals who may wish to participate, these participants were provided permission to forward on the research details, provided that the details of the research (the purpose, participants' rights, contact details, and ethical statement) were included.

Measures

The questionnaire (Appendix A) examined participants' dispositional mindfulness, decision specific reinvestment, movement specific reinvestment, subjective recall of performance under pressure, and performance level. Additionally, the questionnaire gathered information on participants' education background, participation in sport/art, sport/art played, level of employment, and beliefs around their last important performance (i.e., sporting competition/business meeting).

The questionnaire was composed of 57 items, which included a mix of five-point, six-point, and seven-point Likert-type scales. To encourage full and honest participation, participants were informed that the questionnaire was completely confidential and that no information was being collected that could make them identifiable. Additionally, all participants were offered the opportunity to have a summary of the results emailed to them on conclusion of the research.

Mindful Attention Awareness Scale. Brown and Ryan's (2003) 15-item Mindful Attention and Awareness Scale (MAAS) was used to assess participants' level of everyday mindfulness. The scale measures a single factor, and includes items such as "I find it difficult to stay focused on what's happening in the present", "I do jobs or tasks automatically, without being aware of what I'm doing", and "I find myself preoccupied with the future or the past". The Cronbach's alpha for mindfulness was .87 and .83 for the corporate and athletic sample, respectively, which is considered an acceptable and good level of

reliability (Kline, 2011). This measure was selected due to being widely used and previously validated within organisational psychology literature.

Decision Specific Reinvestment Scale. Kinrade, Jackson, Ashford, et al.'s (2010) 13-item Decision Specific Reinvestment Scale (DSRS) was used to assess participants' likeliness to reinvest explicit knowledge when engaging in decision-making. The scale measures two factors; decision reinvestment, which measures participants' propensity to consciously monitor the processes prior to making a decision (e.g., "I'm always trying to figure out how I make decisions.") and decision rumination, which measures participants' propensity to reflect on poor decisions made in the past (e.g., "I remember poor decisions I make for a long time afterwards."). The Cronbach's alpha for the scale was .85 and .88 for the corporate and athletic samples, respectively, which is considered an acceptable and a good level of reliability (Kline, 2011). This measure was selected due to being the only current and validated kind which was relevant to the current study.

Movement Specific Reinvestment Scale. Masters et al.'s (2005) 10-item Movement Specific Reinvestment Scale was used to assess participants' likeliness to reinvest under pressure, such that they try to consciously control *motor* skills. The scale measures two factors; movement self-consciousness (MSC), which assesses participants' likeliness to be concerned about their movements in evaluative situations (e.g., "If I see my reflection in a shop window, I will examine my movements") and conscious motor processing (CMP), which measures participants' propensity to monitor or consciously control their motor movements (e.g., "I try to think about my movements when I carry them out"). The Cronbach's alpha for the scale was .89 and .87 for the corporate and athletic samples, respectively, which is considered acceptable and a good level of reliability (Kline, 2011). This measure was selected due to being the most current and validated kind and most relevant to the current study.

Subjective Recall of Performance under Pressure. A single question was used to assess participants' self-recall of performance when in an important event (i.e., a business presentation or competition), with 'important event' implying a pressure situation, and was measured on a 7-point Likert scale, ranging from 'extreme overperformance' through to 'extreme underperformance'. The question was tailored to athletic performance or corporate performance (e.g., "Recall the last time that you performed in a very important event, such as a

business presentation or conference. Relative to what you know was your best ability at the time, did you underperform or overperform?”).

Performance Level. A single question was used to assess participants' level of performance for both corporate performance and athletic performance. Participants were asked to think about their employment and indicate the highest position they had held in an organisation. A total of nine options were available and ranged from 'Director' through to 'Other (please specify)'. Participants were also asked to think about their athletic participation and indicate the highest level they have played or performed at. A total of nine options were available and ranged from 'International' through to 'Non-Competitive'.

Data Analysis

Multiple data analyses were conducted on the two sample's results for purposes of assessing support for the hypotheses. The data obtained and stored via the survey software *Qualtrics* was exported to the IBM Statistical Package for the Social Sciences (SPSS 23) as well Microsoft Office Excel 2013 (MSExcel). Results will be further explained in the following chapter (Chapter three).

Missing data. Less than 10 percent of the entire sample (15 participants) had missing data at random. As this was an insignificant amount and the missing information was random, the missing data was dealt with using person mean substitution (Downey & King, 1998; McDonald, Thurston, & Nelson, 2000). This method provides an estimated value for missing data based on the participant's individual mean score for a scale in which the missing data is found. Person mean substitution has been found to be an effective method for dealing with missing data in Likert scales, particularly with scales that have less than 20 percent of items missing values (Downey & King, 1998). For the 53 participants who indicated they did not play a sport were subsequently not asked the sport related questions, and thus this data is missing in the sample. This missing data, however, is not relevant in the analyses and so does not impact on final results.

Recoding of variables. Two measures within the study required recoding in order for accurate analysis to occur. Firstly, question 7 and question 11, which measured subjective recall of performance in situations of pressure needed to be recoded to fit with the outlined hypotheses. Question 7 was asked within the sports/arts context, while question 11 was asked within the corporate context. These two questions were based on a 7-point Likert scale, with a value of 1

indicating 'extreme over-performance' through to a value of 7 'extreme under-performance', these were recoded so that 'extreme over-performance' was coded as 7, through to 1 'extreme under-performance'.

Secondly, participants needed to be ranked based on the level of their performance to produce an objective measure of performance. Within the corporate context participants indicated their level of employment and were ranked from 1-through-6, with 6 indicating an extremely high level of performance, through to 1 indicating an extremely low level of performance. A rank of 6 indicated the participant was employed as a Director or C-Suite Manager; 5, Senior Manager; 4, Regional Manager; 3, General Manager; 2, Supervisor or Team Leader; and 1, General Employee. Those participants who selected 'other' and specified their role were allocated a ranking accordingly, for example, those participants who indicated they were a Partner of a firm were ranked 6 (Director or C-Suite Manager).

Within the sports context, a similar process was used as above, where participants indicated their level of participation. Participants were ranked from 1-through-6 (matching the corporate ranking), with 6 indicating an extremely high level of performance, through to 1 indicating an extremely low level of performance. A rank of 6 indicated participation at an International level; 5, Multinational level; 4, National level; 3, Regional level; 2, University sports/ arts club, local sports/arts club, or interschool level; and 1, Social or non-competitive level.

Finally, participants needed to be identified as fitting within the corporate or athletic sample. Participants were allocated to either the corporate sample or athletic sample based on their rankings (as described above), such that where a participant ranked highest (in either employment or athletic participation) determined which sample they were allocated to. As an example, a participant who was ranked 4 for level of employment and 6 for athletic participation were allocated to the athletic sample as they ranked highest there. Participants who had equal rankings for both their athletic participation and employment were assigned groups using systematic assignment (Carter & Lubinsky, 2015).

Exploratory factor analysis. Exploratory factor analysis (EFA) using principal axis factoring and oblique rotation (Direct Oblimin) was conducted on the three main scales used in the study (MAAS, DSRS, and MSRS). The criterion for factor retention is generally accepted as an eigenvalue greater than 1 (Kaiser,

1960) or data points that are above the point of inflexion in a scree plot (Yong & Pearce, 2013). For conducting an EFA, Field (2013) suggests that an adequate sample size should be at least 10-15 participants per variable. The present study was well within this sample size adequacy for both samples, with a ratio of 12:1 (63 participants and 5 variables) for the athletic sample, and a ratio of 23:1 (119 participants and 5 variables) for the corporate sample. In examining factor loadings, Yong and Pearce (2013) indicate a rotated factor loading of .32 can be considered statistically meaningful; with .32 providing roughly 10 percent of overlapping variance. When an item loads on two or more factors at .32 or greater, this is considered a cross-loading (Yong & Pearce, 2013) and it is suggested that items which cross load should be removed from the analysis, particularly if the loading on each is strong at .5 or greater (Costello & Osborne, 2005). Costello and Osborne (2005) suggest that factors with less than three items can be considered 'weak' and 'unstable', and may need to be interpreted with caution. A factor with at least 5 strong loadings (at .5 or greater) is said to be desirable (Costello & Osborne, 2005). Given that each measure in the current study is already widely validated with respect to how each item factors out, the current study conducted an EFA using a fixed number of factors for extraction (Field, 2013), indicating the desired number of factors to be extracted based on validated literature for the measures.

Descriptive statistics. Descriptive statistical analyses were run to provide information on frequencies, means, skew and kurtosis for the data. Before further analysis should be run it is advised to examine levels of skew and kurtosis to ensure that no data needs to be transformed. Kline (2011) indicates that a skew value larger than +/-3 indicates data is extremely skewed. A kurtosis value of greater than +/-8 is said to indicate extreme kurtosis. When data shows extreme levels of skew or kurtosis it is suggested that data be transformed (Kim, 2013; Kline, 2011). The current results did not show any data within these extreme ranges, and, therefore, did not require any transformations to be carried out.

Reliability analysis. The Cronbach's alphas (α) for each item and scale was carried out to indicate levels of internal reliability. Gliem and Gliem (2003) provide value guidelines for determining internal reliability, indicating that values between .7 and .9 suggest acceptable or excellent levels of internal reliability, with .7 being acceptable, .8 being good, and .9 being excellent. The current study indicated for the MAAS reliability values of .87 and .83 for the corporate and

athletic samples, respectively. For the DSRS, results showed reliability values of .85 and .88 for the corporate and athletic samples, respectively. Finally, for the MSRS, results indicated reliability values of .89 and .87 for the corporate and athletic samples, respectively. All of these results indicate excellent levels of internal reliability of the scales.

Correlation analysis. Pearson's product-moment correlations were examined to identify whether there were any significant correlations between variables, and to determine whether there was support for any of the outlined hypotheses. The correlation analysis tables (Table 6, p.39 and Table 11, p.45) in the following chapter outline the correlation values between variables for each sample and indicate which of these show significance. Significance is determined by a correlation *p*-value falling within a range of .05, .01, and .001.

Sample size and power. In determining the appropriate number of participants required to provide adequate power, such that a true effect is found (avoiding Type II or beta (β) error), Friedman (1982) provides guidelines for sample sizes based on three factors; the size of the effect expected, the level of significance (i.e., .05 or .01), and the statistical power. Based on Friedman's guidelines, a sample size of 119 for the corporate sample, gives this sample's correlations a power of .80 at the .05 level ($r = .25$), suggesting an 80 percent chance or likelihood of detecting a true relationship between the variables. For the athletic group a sample size of 63 gives this sample's correlations a power of .50 at the .05 level ($r = .25$), indicating a 50 percent chance or likelihood of detecting a true relationship between the variables.

Regression analysis. A linear regression analysis using forced entry was carried out to assess if there was support for the hypotheses relating to moderation effects. Simple slope analyses (Aiken, West, & Reno, 1991; Dawson, 2014) were carried out only for those results which indicated significant interactions (*p*-values less than .05). As the regression analysis was examining interaction terms, the data for each variable were transformed using grand mean centring prior to analysis (Field, 2013).

Post hoc analysis. A hierarchical regression (blockwise entry) analysis (Field, 2013) was carried out due to the statistically significant results of the regression analysis for decision reinvestment. Two separate hierarchical regressions were conducted on the two separate factors of the DSRS to determine if one of the factors was contributing more to the moderation relationship between

mindfulness, decision reinvestment, and performance level. The results of these analyses are discussed in the following chapter.

Summary

The method that has been used in this research, including method of data analysis, have been outlined in the current chapter. All methods used in the current study fit with current guidelines and have valid reasoning for their use outlined. A detailed report of the results will be provided in the following chapter.

Chapter Three: Results

This chapter presents the statistical analyses of the study's data and describes the results. The chapter explores the results for the corporate sample and athletic sample separately. The sections of this chapter are as follows; factor analysis, reliability analysis, descriptive statistics, correlations and moderation analyses for the corporate sample, correlations and moderation analyses for the athletic sample, post hoc analyses, and summary.

Exploratory Factor Analysis

Exploratory factor analysis (EFA) using principal axis factoring and oblique rotation (Direct Oblimin) was conducted on the three main scales used in the study (Mindful Attention Awareness Scale, Decision Specific Reinvestment Scale, and Movement Specific Reinvestment Scale). As each measure in the current study is already widely validated with respect to how each item factors out, the EFA was carried out using a fixed number of factors for extraction, specifying the desired number of factors to be extracted based on the current literature for the measures (Preacher, Zhang, Kim, & Mels, 2013).

Mindful Attention Awareness Scale. Principal Axis Factoring (PAF) was conducted on the 15-items of the Mindful Attention Awareness Scale with an Oblique 'Direct Oblimin' rotation. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, $KMO = .87$, and all KMO values for the individual items were greater than .80, well above the accepted limit of .50 (Field, 2013). Bartlett's test of sphericity, $X^2(105) = 960.911$, $p < 0.001$, showed that there were patterned relationships between the items. Using a fixed number of factors to retain, there was a single factor that explained a cumulative variance of 37.1%, which was subsequently retained for the final analysis and thus did not require rotation.

Decision Specific Reinvestment Scale. Principal Axis Factoring (PAF) was conducted on the 13-items of the Decision Specific Reinvestment Scale using an Oblique 'Direct Oblimin' rotation. The Kaiser-Meyer Olkin (KMO) measure verified the sampling adequacy for the analysis, $KMO = .87$, and all KMO values for the individual items were greater than .80, except for one item which had a value of .63. Nevertheless, all items were above the accepted limit of .50 (Field, 2013). Bartlett's test of sphericity, $X^2(78) = 1040.6$, $p < .001$, showed there were

patterned relationships between the items. Using the same number of factors as outlined in previously validated studies (Kinrade, Jackson, Ashford, et al., 2010), two factors were extracted and explained a cumulative variance of 55.4%. Table 1 shows the factor loadings after rotation. The items that cluster on the same factor suggest that Factor One shows decision rumination, and Factor Two shows decision reinvestment. One item (Item One in Table 1) appeared to load on the incorrect factor as per previous studies; however, this was disregarded on the basis of previously validated literature examining the scale (i.e., the original factor structure was used in data-analysis). Note that, despite the scale indicating two factors, it can also be analysed as a single factor, measuring an overall score for reinvestment (Kinrade, Jackson, Ashford, et al., 2010); this single factor structure was used in the initial data analyses for the current study.

Table 1.

Pattern matrix of decision reinvestment.

	Factor	
	1	2
I'm concerned about my style of decision-making.	.435	
I remember poor decisions I make for a long time afterwards.	.706	
I get "worked up" just thinking about poor decisions I have made in the past.	.897	
I often find myself thinking over and over about poor decisions that I have made in the past.	.886	
I think about better decisions I could have made long after the event has happened.	.68	
I rarely forget the times when I have made a bad decision, even about the minor things.	.578	
When I am reminded about poor decisions I have made in the past, I feel as if they are happening all over again.	.676	
I'm concerned about what other people think of the decisions I make.	.589	
I'm always trying to figure out how I make decisions.		.516
I'm constantly examining the reasons for my decisions.		.567
I am alert to changes in how much thought I give to my decisions.		.609
I'm aware of the way my mind works when I make a decision.		.569
I sometimes have the feeling that I'm observing my decision-making process.		.637

Note. Rotation converged in 6 iterations

Movement Specific Reinvestment Scale. Principal Axis Factoring (PAF) was conducted on the 10-items of the Movement Specific Reinvestment Scale with an Oblique ‘Direct Oblimin’ rotation. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .88, and all KMO values for the individual items were greater than .8, all well above the accepted limit of .50 (Field, 2013). Bartlett’s test of sphericity, $X^2(45) = 986.625$, $p < 0.001$, showed that there were patterned relationships between the items. Using a fixed number of factors to retain (Masters et al., 2005), there were two factors that explained a cumulative variance of 64.34%. Table 2 shows the factor loadings after rotation. The items that cluster on the same factor suggest Factor One indicates conscious motor processing, and Factor Two indicates movement self-consciousness. One item (Item Ten in Table 2) appeared to load on to the incorrect factor as per previous studies; however, the original factor structure, as per previously validated studies, was used in the current study’s data-analysis. Note that, despite the scale indicating two factors, it can also be analysed as a single factor, measuring an overall score for reinvestment (Masters et al., 2005); this single factor structure was used in the initial data analyses for the current study.

Table 2.

Pattern matrix of movement reinvestment.

	Factor	
	1	2
I remember the times when my movements have failed me.	.368	
I reflect about my movement a lot.	.771	
I try to think about my movements when I carry them out.	.948	
I am aware of the way my body works when I am carrying out a movement.	.718	
I sometimes have the feeling that I am watching myself move.	.592	
I try to figure out why my actions failed.	.606	
If I see my reflection in a shop window, I will examine my movements.		-.363
I am concerned about my style of moving.		-.549
I am concerned about what people think about me when I am moving.		-.974
I am self conscious about the way I look when I am moving.		-.803

Note. Rotation converged in 7 iterations

Reliability Analysis

A reliability analysis was carried out on the Mindful Attention Awareness Scale, Decision Specific Reinvestment Scale, and Movement Specific Reinvestment Scale. Using Cronbach's alpha (α), each measure was tested for internal reliability with the level of reliability being determined by the cut-off values as outlined in the previous chapter (Method) of .7 and .9. The reliabilities of these scales are reported in Table 6 p. 39 and Table 11 p. 45, for each sample.

Table 3.

Descriptive statistics for each sample.

	<i>N</i>	Mean	St. Dev	Skew.	Kurtosis
Corporate Sample					
MAAS	119	4.03	.684	-.189	-.369
DSRS	119	3.23	.676	.148	-.516
MSRS	119	2.96	1.105	.282	-.431
RPP	119	4.62	1.200	-.188	-.578
Performance Level	119	4.23	1.811	-.667	-1.022
Athletic Sample					
MAAS	63	3.72	.653	.033	.863
DSRS	63	3.37	.741	-.574	.189
MSRS	63	3.83	.998	-.294	-.244
RPP	63	4.03	1.402	-.058	-.493
Performance Level	63	4.54	1.605	-.485	-1.292

Note. MAAS = Mindful Attention Awareness Scale; DSRS = Decision Specific Reinvestment Scale; MSRS = Movement Specific Reinvestment Scale; RPP = Recall of Performance under Pressure.

Descriptive Statistics

The descriptive statistics, including the mean, standard deviation, skew, and kurtosis for all the variables for the corporate sample and athletic sample are displayed in Table 3 above. Additional statistics are displayed in Table 4 p. 36 and Table 5 p. 37 for the corporate sample and Table 9 p. 42 and Table 10 p. 43 for the athletic sample. The mean for mindfulness was measured on a scale of one to six (1 = almost always and 6 = almost never). The mean for decision reinvestment was measured on a scale of one to five (1 = extremely uncharacteristic and 5 = extremely characteristic). The mean for movement reinvestment was measured on scale of one to six (1 = strongly disagree and 6 = strongly agree). The mean for subjective recall of performance under pressure was measured on a scale of one to seven (1 = extreme underperformance and 7 = extreme overperformance). The

mean for performance level was measured on a scale of one to six (1 = extremely low performance and 6 = extremely high performance).

Corporate Sample Results

The means across all variables ranged between 2.96 and 4.62, as shown in Table 3. On average, for mindfulness, participants indicated ‘*somewhat infrequently*’ or ‘*very infrequently*’ for statements relating to their everyday experiences ($M = 4.03$, $SD = .70$). On average, for decision reinvestment, participants were either ‘*neutral*’ or ‘*somewhat characteristic*’ for the statements relating to their decision making processes ($M = 3.23$, $SD = .70$). For movement reinvestment, participants, on average, indicated either moderate or weak disagreement for statements relating to their movement ($M = 2.96$, $SD = 1.1$). On average, for subjective recall of performance under pressure, participants indicated either ‘*no change*’ or ‘*slight overperformance*’ ($M = 4.62$, $SD = 1.2$). For performance level, participants were on average ranked between 4 and 5 ($M = 4.23$, $SD = 1.8$), indicating either a regional or senior managerial role in employment and, therefore, within high levels of performance.

Table 4.

Employment level for corporate participants.

Level of Employment	<i>N</i>	Percentage
Director	29	24.4
C-Suite Manager	11	9.2
Senior Manager	29	24.4
Regional Manager	13	10.9
General Manager	8	6.7
Supervisor	9	7.6
Team Leader	4	3.4
General Employee	14	11.8
Other	2	1.7
<i>TOTAL</i>	119	100.0

Table 5.

Performance level for corporate participants.

Performance Level	N	Percentage
1 - Very Low Performing	16	13.4
2 – Somewhat Low Performinng	13	10.9
3 – Low Performing	8	6.7
4 – High Performing	13	10.9
5 – Somewhat High Performing	29	24.4
6 - Very High Performing	40	33.6
<i>TOTAL</i>	119	100.0

Correlational analysis. To explore the correlations between the variables in the corporate sample and to determine whether there was support for any of the hypotheses, a Pearson’s product-moment correlational analysis was carried out. Table 6 details the Pearson product-moment correlations. Based on Friedman’s (1982) guidelines, a sample size of 119, gives the current sample’s correlations a power of .80 at the .05 level ($r = .25$), suggesting an 80 percent chance or likelihood of detecting a true relationship between the variables.

Hypothesis 1a. It was hypothesised that mindfulness would be positively associated with subjective recall of performance under pressure for the corporate sample. The correlational analysis showed that there was a positive relationship between mindfulness and subjective recall of performance under pressure ($r = .155, p >.05$); however, this was not significant, so only provides partial support for the hypothesis.

Hypothesis 2a. It was hypothesised that mindfulness would be positively associated with performance level for the corporate sample. The results of the correlation analysis indicated that there was a significant positive relationship between the two variables, providing support for the hypothesis ($r = .229, p <.05$). This indicates that as corporate participants’ levels of mindfulness increased so too did their level of performance.

Hypothesis 3a. It was hypothesised that decision reinvestment would be negatively associated with subjective recall of performance under pressure for corporate participants. The results indicate a significant negative relationship between decision reinvestment and subjective recall of performance under pressure ($r = -.190, p <.05$), implying that as corporate participants’ levels of

decision specific reinvestment increased their subjective recall of performance under pressure decreased, thus providing support for the hypothesis.

Hypothesis 4a. It was hypothesised that decision reinvestment would be negatively associated with performance level for corporate participants. The correlational analysis showed that there was a significant negative relationship between decision reinvestment and performance level ($r = -.243, p < .01$), implying that as corporate participants' levels of decision reinvestment increased their level of performance decreased. This hypothesis was, therefore, supported.

Hypothesis 5a. It was hypothesised that movement reinvestment would be negatively associated with subjective recall of performance under pressure for corporate participants. The results indicate that there was a negative relationship between the two variables; however, this was not significant ($r = -.054, p > .05$), and thus only partially supports the hypothesis.

Hypothesis 6a. It was hypothesised that movement reinvestment would be negatively associated with performance level for corporate participants. The results indicated that there was a negative relationship between these variables; however, this was not significant ($r = -.027, p > .05$), so only partial support for the hypothesis was provided.

Moderation analysis. As previously discussed in the methods chapter, a linear regression analysis was carried out to assess if there was support for the hypotheses relating to moderation effects. The results of the analysis, using subjective recall of performance under pressure as the outcome variable, are detailed in Table 7 and, using performance level, in Table 8. Simple slope analyses (Aiken et al., 1991; Dawson, 2014) were carried out for only those results which indicated significant interactions (p -value less than .05).

Hypothesis 7a. It was hypothesised that decision reinvestment would moderate the relationship between mindfulness and subjective recall of performance under pressure for corporate participants. The results indicated that there was no significant moderation effect ($p > .05$), and thus did not support the hypothesis.

Table 6.

Pearson product-moment correlations for all variables and Cronbach's alphas for corporate participants.

Variables	Mindful Attention Awareness Scale	Decision Specific Reinvestment Scale	Movement Specific Reinvestment Scale	Subjective Recall of Performance	Performance Level
Mindful Attention Awareness Scale	.869				
Decision Specific Reinvestment Scale	-.217*	.853			
Movement Specific Reinvestment Scale	-.044	.381**	.894		
Subjective Recall of Performance	.155	-.190*	-.054	-	
Performance Level	.229*	-.243**	-.027	.180*	-

Sample size = 119, * $p < .05$, ** $p < 0.01$; reliability for each measure in bold on diagonal.

Table 7.

Linear model of predictors of subjective recall of performance under pressure for corporate participants.

	B	Std. Error	β	t	p
Constant	4.634	.117	-	39.744	.000
MAAS	.158	.168	.090	.940	.349
DSRS	-.320	.179	-.180	-1.791	.076
MSRS	.035	.111	.032	.312	.756
DSRS \times MAAS	.394	.232	.161	1.693	.093
MSRS \times MAAS	-.103	.153	-.068	-.673	.502

Note. $R^2 = .074$; $n = 119$; MAAS = Mindful Attention and Awareness Scale; DSRS = Decision Specific Reinvestment Scale; MSRS = Movement Specific Reinvestment Scale

Hypothesis 8a. It was hypothesised that decision reinvestment would moderate the relationship between mindfulness and performance level for corporate participants. The results indicated that there was a significant moderation effect between these two variables ($b = .732$, $SE_b = .337$, $\beta = .198$, $p = .032$) (see Table 8) and thus supported the hypothesis. Simple slopes for the association between mindfulness and performance level were tested for low (1 – ‘extremely uncharacteristic’) and high (6 – ‘extremely characteristic’) levels of decision reinvestment. Each of the simple slope tests revealed a significant positive association between mindfulness and performance level ($p < .05$). Figure 5 plots the simple slopes for the interaction. This plot indicates that the influence of mindfulness level on corporate performance is slightly important for participants with low decision reinvestment and very important for participants with high decision reinvestment. This indicates that participants with high decision reinvestment and low mindfulness perform worse than those who have high decision reinvestment and high mindfulness, who are shown to perform very well.

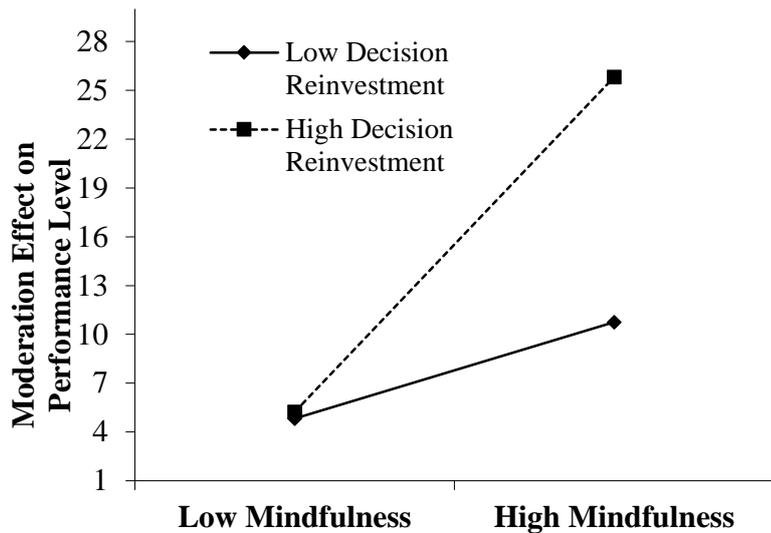


Figure 5. Two-way interaction of mindfulness and decision reinvestment on corporate performance level.

Hypothesis 9a. It was hypothesised that movement reinvestment would moderate the relationship between mindfulness and subjective recall of performance under pressure for corporate participants. The results indicated that there was no significant moderation effect ($p > .05$), and thus did not support the hypothesis.

Hypothesis 10a. It was hypothesised that movement reinvestment would moderate the relationship between mindfulness and performance level for corporate participants. The results indicated that there was no significant moderation effect and, therefore, did not provide support for the hypothesis ($p > .05$).

Table 8.

Linear model of predictors of performance level for corporate participants.

	B	Std. Error	β	t	p
Constant	4.255	.169	-	25.141	.000
MAAS	.457	.244	.173	1.871	.064
DSRS	-.626	.259	-.234	-2.412	.017
MSRS	.080	.161	.049	.496	.621
DSRS \times MAAS	.732	.337	.198	2.169	.032
MSRS \times MAAS	.116	.223	.050	.522	.603

Note. $R^2 = .142$; $n = 119$; MAAS = Mindful Attention and Awareness Scale; DSRS = Decision Specific Reinvestment Scale; MSRS = Movement Specific Reinvestment Scale

Athletic Sample Results

The means across all variables ranged between 3.37 and 4.54 (see Table 3, p. 35). On average, for mindfulness, participants indicated 'somewhat frequently' or 'somewhat infrequently' for statements relating to their everyday experiences ($M = 3.72$, $SD = .6$). On average, for decision reinvestment, participants were either 'neutral' or 'somewhat characteristic' for the statements relating to their decision making processes ($M = 3.37$, $SD = .7$). For movement reinvestment, participants, on average, indicated either weak disagreement or agreement for statements relating to their movement ($M = 3.83$, $SD = .9$). On average, for subjective recall of performance under pressure, participants indicated either 'no change' or 'slight overperformance' ($M = 4.03$, $SD = 1.4$). For performance level, participants were on average ranked between 4 and 5 ($M = 4.54$, $SD = 1.6$), indicating either National or Multinational sport/art performance, and, therefore, within high levels of performance.

Table 9.

Participation level for athletic sample.

Level of Sport	<i>N</i>	Percentage
International	31	49.2
Multinational	2	3.2
National	10	15.9
Regional	11	17.5
University Sports/ Arts Club	3	4.8
Local Sports/ Arts Club	5	7.9
Interschool	1	1.6
Social	0	0.0
Non-Competitive	0	0.0
<i>TOTAL</i>	63	100.0

Table 10.

Performance level for athletic sample.

Performance Level	N	Percentage
1 - Very Low Performing	1	1.6
2 – Somewhat Low Performing	8	12.7
3 – Low Performing	11	17.5
4 – High Performing	10	15.9
5 – Somewhat High Performing	2	3.2
6 - Very High Performing	31	49.2
<i>TOTAL</i>	63	100.0

Correlational analysis. To explore the correlations between the variables in the athletic sample and to determine whether there was support for any of the hypotheses, a Pearson’s product-moment correlational analysis was conducted. Table 11 details the Pearson product-moment correlations. Based on Friedman’s guidelines, a sample size of 63, gives the current sample’s correlations a power of .50 at the .05 level ($r = .25$), suggesting a 50 percent chance or likelihood of detecting a true relationship between the variables.

Hypothesis 1b. It was hypothesised that mindfulness would be positively associated with subjective recall of performance under pressure for athletic participants. The correlational analysis showed that there was a positive relationship between mindfulness and subjective recall of performance under pressure; however, this was not significant ($r = .179, p >.05$), providing only partial support for the hypothesis.

Hypothesis 2b. It was hypothesised that mindfulness would be positively associated with performance level for athletic participants. The results of the correlation analysis indicated that there was a positive relationship between the two variables, but again the relationship was not significant ($r = .095, p >.05$), providing only partial support for the hypothesis.

Hypothesis 3b. It was hypothesised that decision reinvestment would be negatively associated with subjective recall of performance under pressure for athletic participants. The results indicated a negative relationship between decision reinvestment and subjective recall of performance under pressure;

however, this was not significant ($r = -.103, p >.05$), providing only partial support for the hypothesis.

Hypothesis 4b. It was hypothesised that decision reinvestment would be negatively associated with performance level for athletic participants. The correlational analysis showed that there was a negative relationship between decision reinvestment and performance level; however, this was non-significant ($r = -.107, p >.05$), so only provides partial support for the hypothesis.

Hypothesis 5b. It was hypothesised that movement reinvestment be negatively associated with subjective recall of performance under pressure for athletic participants. The results indicated that there was no significant relationship between the two variables, ($r = .004, p >.05$), and thus does not support the hypothesis.

Hypothesis 6b. It was hypothesised that movement reinvestment would be negatively associated with performance level for athletic participants. The results indicated that there was a positive relationship between these variables; however, this was not significant ($r = .138, p >.05$), so the hypothesis was not supported.

Moderation analysis. As previously discussed in the methods chapter, a linear regression analysis was carried out to assess if there was support for the hypotheses relating to moderation effects. The results of the analysis, using subjective recall of performance under pressure as the outcome variable, are detailed in Table 12 and, using performance level, in Table 13. Simple slope analyses (Aiken et al., 1991; Dawson, 2014) were carried out for only those results which indicated significant interactions (p -value less than .05).

Hypothesis 7b. It was hypothesised that decision reinvestment would moderate the relationship between mindfulness and subjective recall of performance under pressure for athletic participants. The results indicated that there were no significant moderation effects ($p >.05$), and thus did not support the hypothesis.

Hypothesis 8b. It was hypothesised that decision reinvestment would moderate the relationship between mindfulness and performance level for athletic participants. The results indicated that there was no significant moderation effect between these two variables ($p >.05$), and thus did not support the hypothesis.

Table 11.

Pearson product-moment correlations for all variables and Cronbach's alphas for athletic participants.

Variables	Mindful Attention Awareness Scale	Decision Specific Reinvestment Scale	Movement Specific Reinvestment Scale	Subjective Recall of Performance	Performance Level
Mindful Attention Awareness Scale	.829				
Decision Specific Reinvestment Scale	-.299*	.875			
Movement Specific Reinvestment Scale	-.058	.455**	.869		
Subjective Recall of Performance	.179	-.103	.004	-	
Performance Level	.095	-.107	.138	-.087	-

Sample size = 63, * $p < .05$, ** $p < 0.01$; reliability for each measure in bold on diagonal.

Table 12.

Linear model of predictors of subjective recall of performance under pressure for athletic participants.

	B	Std. Error	β	<i>t</i>	<i>p</i>
Constant	4.086	.226	-	18.097	.000
MAAS	.262	.408	.122	.642	.523
DSRS	-.107	.294	-.057	-.364	.717
MSRS	.103	.219	.073	.470	.640
DSRS \times MAAS	.259	.363	.102	.713	.479
MSRS \times MAAS	.043	.349	.025	.124	.902

Note. $R^2 = .046$; $n = 63$; MAAS = Mindful Attention and Awareness Scale; DSRS = Decision Specific Reinvestment Scale; MSRS = Movement Specific Reinvestment Scale

Hypothesis 9b. It was hypothesised that movement reinvestment would moderate the relationship between mindfulness and subjective recall of performance under pressure for athletic participants. The results indicated that there were no significant moderation effects ($p > .05$), and thus did not support the hypothesis.

Hypothesis 10b. It was hypothesised that movement reinvestment would moderate the relationship between mindfulness and performance level for athletic participants. The results indicated that there was no significant moderation effect and, therefore, did not provide support for the hypothesis ($p > .05$).

Table 13.

Linear model of predictors of performance level for athletic participants.

	B	Std. Error	β	<i>t</i>	<i>p</i>
Constant	4.420	.256	-	17.300	.000
MAAS	.132	.461	.054	.286	.776
DSRS	-.388	.333	-.179	-1.167	.248
MSRS	.385	.247	.239	1.554	.126
DSRS \times MAAS	.307	.411	.105	.746	.459
MSRS \times MAAS	-.076	.395	-.038	-.193	.847

Note. $R^2 = .067$; $n = 63$; MAAS = Mindful Attention and Awareness Scale; DSRS = Decision Specific Reinvestment Scale; MSRS = Movement Specific Reinvestment Scale

Post hoc Analysis

Given that a significant interaction effect was found between decision reinvestment, mindfulness, and performance level for the corporate sample, it was decided to explore the two factors of decision reinvestment (decision rumination and decision reinvestment) separately to examine how these factors interact with mindfulness and performance level.

Based on previous literature on mindfulness and the strong link with decreasing rumination, it was predicted that decision rumination would account for the most variance, so a hierarchical regression analysis was conducted based on this hypothesis (Field, 2013). The results are displayed in Table 14 p. 48 and indicate that both mindfulness and decision rumination significantly and positively relate to levels of performance ($p = .019$) but decision reinvestment does not ($p = .353$). The moderator effects are displayed in Step 3 of each equation in Table 14. Simple slope analyses for the association between mindfulness and performance level were tested for low (1 – ‘extremely uncharacteristic’) and high (6 – ‘extremely characteristic’) levels of decision rumination. Each of the simple slope tests revealed a significant positive association between mindfulness and performance. Figure 6 p. 48 plots the simple slopes for the interaction. This plot indicates that the influence of mindfulness on corporate performance level is important for participants with low decision rumination and very important for participants with high decision rumination. This indicates that participants with high decision rumination and low mindfulness perform worse than those who have high decision rumination and high mindfulness, who are shown to perform very well.

Summary

This chapter has detailed the results of the study for each sample (athletic and corporate). Overall, the results indicate that most of the direct hypotheses were supported, while only one of the moderating hypotheses was supported, and this was for the corporate sample (see Figure 7-10 for the theoretical models and results). The results will be discussed in the following chapter.

Table 14.

Moderating effects of decision reinvestment on the relationship between mindfulness and performance level for corporate participants.

Performance level criterion	Predictor	β	t	p
Equation 1: Decision Rumination				
Step 1	MAAS	0.229	2.548	.012
Step 2	Decision Rumination	-.253	-2.809	.006
Step 3	Decision Rumination x MAAS	.205	2.387	.019
Equation 2: Decision Reinvestment				
Step 1	MAAS	.229	2.548	.012
Step 2	Decision Reinvestment	-.053	-.589	.557
Step 3	Decision Reinvestment x MAAS	.163	-.932	.353

Note. MAAS = Mindful Attention Awareness Scale.

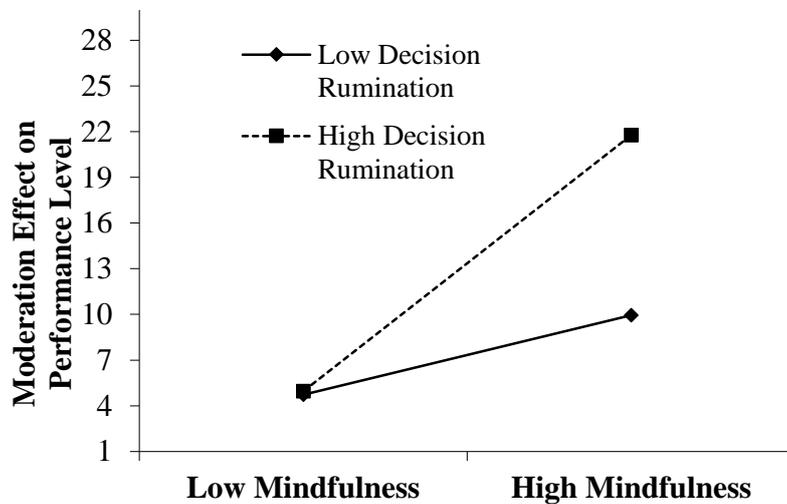


Figure 6. Two-way interaction of mindfulness and decision rumination on corporate performance level.

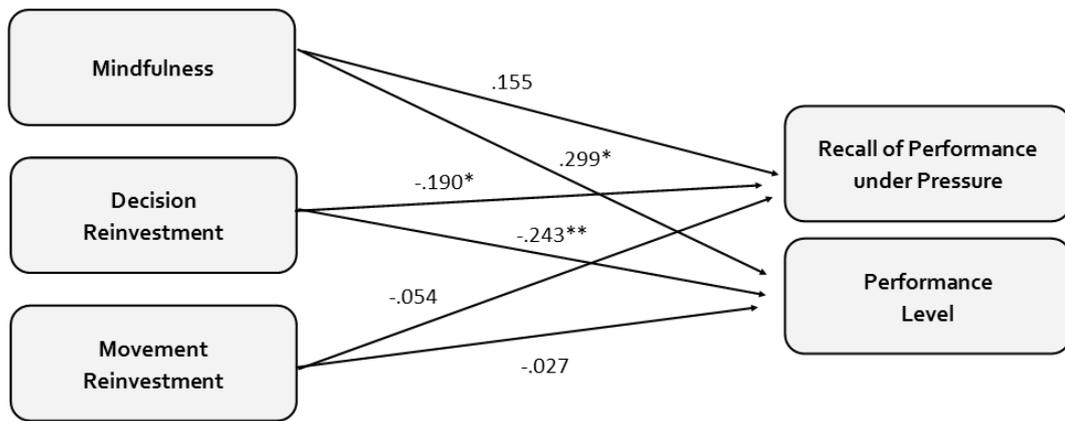


Figure 7. Framework of hypothesised relationships for each variable with correlations (r-value) for corporate participants.

Note. *p < .05, **p < .001.

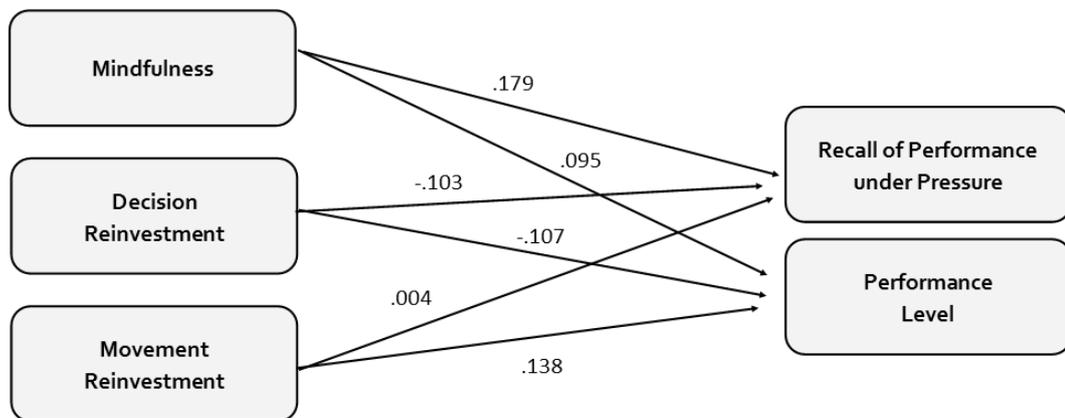


Figure 8. Framework of hypothesised relationships for each variable with correlations (r-value) for athletic participants.

Note. *p < .05, **p < .001.

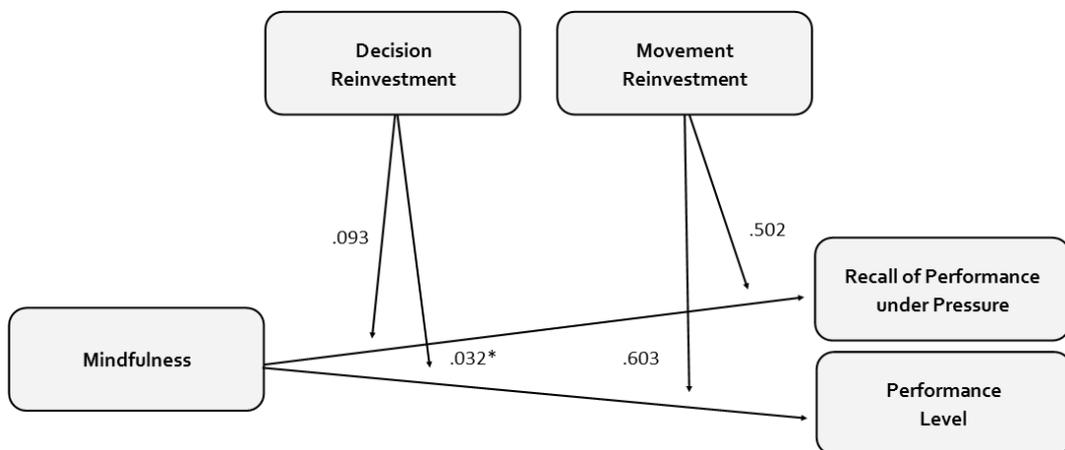


Figure 9. Framework of hypothesised moderating relationships for corporate sample with p-values.

Note. *p < .05, **p < .001.

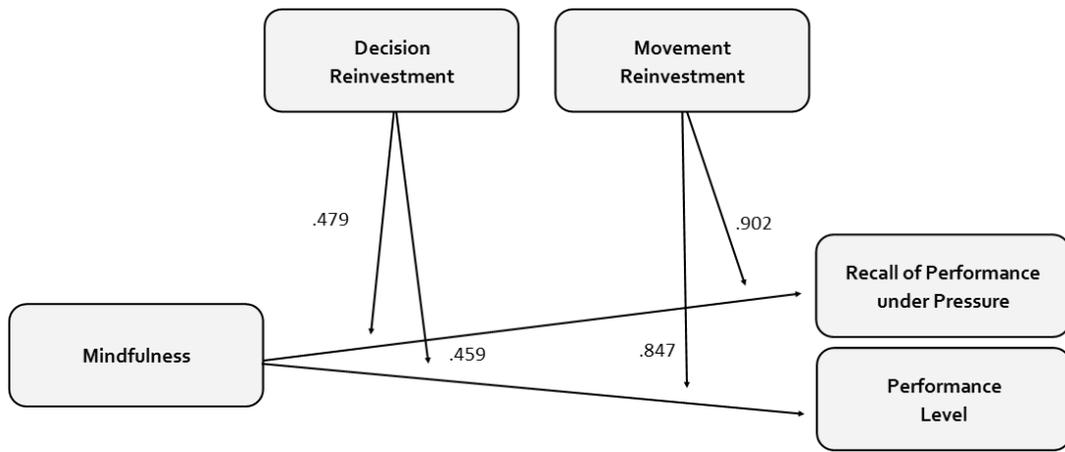


Figure 10. Framework of hypothesised moderating relationships for athletic sample with p-values.

Note. *p < .05, **p < .001.

Chapter Four: Discussion

The current study was designed to explore notions of mindfulness within high performance leadership, and to examine the influence of mindfulness on performance at both a subjective (self-reported recall of performance under pressure) and an objective (actual performance) level, across two different high performing samples. In exploring the current gaps within high performance leadership literature, the present study was designed to make two main contributions: Firstly, to assess the role of mindfulness and the conditions in which mindfulness is effective in high performance; and secondly, to introduce the concept of *reinvestment* from Sport Psychology into Industrial/ Organisational Psychology literature.

The following chapter is divided in to several distinct discussion sections, and follows the ensuing format: examination and discussion of the direct relationships between mindfulness and performance, decision reinvestment, and movement reinvestment; discussion and interpretation of the moderation analyses and results; discussion of the post hoc findings; discussion of the practical implications; strengths and limitations of the work; suggestions for future research; and finally, concluding remarks.

Mindfulness and Performance

In following past research, which has examined mindfulness in relation to performance (Brown et al., 2007; Dane & Brummel, 2013; Weinstein et al., 2009), the current study clearly demonstrated and supported the notion that mindfulness plays a significant role in performance. This, however, was only found for the corporate sample and for the objective variable, *performance level* (Hypothesis 2a). This suggests that mindfulness may not play a significant role in enhancing participants' recall of performance under pressure (Hypotheses 1a, 1b), but that it does relate to enhanced actual performance.

For the corporate sample, mindfulness appears to significantly correlate with participants' actual levels of performance, such that those participants who were higher in mindfulness held higher levels of employment (i.e., management/ leadership roles), supporting hypothesis 2a. It is important to acknowledge that while the results for the athletic sample were not significant, they were still partially supported. The low sample size may be a factor contributing to the lack

of a significant finding (de Vaus, 2004). For this reason, it cannot be dismissed that this relationship may also be found within this sample.

In further exploring the positive correlation between mindfulness and performance level (Hypothesis 2a), it was highlighted in the introduction that for corporate leaders, the ability to focus on task relevant cues may be essential for effective leadership (refer back to p.3). Dane (2011) discussed the role of mindfulness in relation to task expertise, attention, and the work environment, arguing that the "... impact of mindfulness on task performance depends on both the task environment in which one operates and one's ability to perform the task" (p. 1004). It was suggested that in dynamic environments, high performing leaders who focus their attention directly on the *present-moment* may potentially achieve greater performance on a variety of tasks (Dane, 2011). This suggestion may reflect the current finding, where high performing leaders would be expected to accomplish a variety of tasks to a high level, and potentially within challenging timeframes and contexts. It is likely that those individuals who can do this would perform well at higher levels of management or leadership, which may reflect the significant link between high performing leaders (as determined by leadership level) and mindfulness; where these leaders have the ability to engage in focused attention on the task at hand, and be less distracted, thus leading to greater performance level.

In further exploring the results for Hypothesis 2a, as discussed in the introduction, leaders working in dynamic environments are required to control their emotions and behaviours in ways which are constructive. It was suggested that those individuals who are high in mindfulness "... observe their thoughts and feelings without reacting to them in maladaptive ways and therefore are better able to behave constructively even when unpleasant thoughts and feelings are present" (Bowlin & Baer, 2012, p. 411). Given the importance of this, and the significant finding between mindfulness and performance level, it can be suggested that those individuals who were high in mindfulness reached these higher levels of employment as a direct result of being able to engage in effective emotion regulation, through being more mindful.

Scholars have also demonstrated that mindfulness relates positively to a range of tasks such as positive judgements (reducing negativity bias) (Kiken & Shook, 2011), problem solving and creativity (Ostafin & Kassman, 2012), attentional performance and cognitive flexibility (Moore & Malinowski, 2009)

and executive functioning (i.e., cognitive processes) (Zeidan, Johnson, Diamond, David, & Goolkasian, 2010). These studies may highlight the significant finding between mindfulness and corporate performance level in the current study. Given the tasks and abilities described above can be identified as key to effective leadership, this may contribute to whether individuals advance up the corporate ladder.

Finally, in relation to Hypothesis 2a, EnginDeniz, Ari, Akdeniz, and Özteke (2015) explored whether mindfulness predicted decision self-esteem (e.g., competence and self-esteem as a decision maker) and the styles used for making a decision (e.g., the way we perceive and understand situations). As mentioned earlier, the results of their study highlighted a negative relationship between mindfulness and elements of the decision making style, *defensive avoidance*. Defensive avoidance suggests that, “the decision maker escapes conflict by procrastinating, shifting responsibility to someone else, or constructing wishful rationalizations to bolster the least objectional alternative” (Mann et al., 1997, p. 2). Given that decision making is essential to high performance leadership, EnginDeniz et al. (2015) support the current study’s findings. Those individuals who have low levels of mindfulness may have low levels of self-esteem and may be unable to use their initiative when seeking solutions to problems, or may procrastinate, thus reducing the likeliness of climbing the ranks within the corporate setting.

While Hypothesis 1a and 1b were unsupported, such that there was no significant association between mindfulness and subjective recall of performance under pressure, this outcome can be explored by examining notions of *attention*. Herndon (2008) explored the benefits of mindfulness in relation to attention to internal stimuli (e.g., thinking processes/ patterns) or external stimuli (e.g., objects in the environment around us). Herndon (2008) sought to determine whether the benefits of mindfulness in relation to well-being was, in some part, increased by greater attention to external stimuli and less to internal stimuli. It was argued that internal attention, as related to negative psychological behaviours such as neuroticism (i.e., anxiety, self-consciousness, and worry), prevents mindfulness (Brown & Ryan, 2003) and that by paying more attention to the external environment, as described by *present moment awareness* (Brown & Ryan, 2003), this reduces levels of neuroticism by lessening the amount of internally-directed attention. In the current study, the average response for subjective recall of

performance under pressure was either ‘no change’ or ‘slight overperformance’, this was for both corporate and sports samples. It could be that no significant relationship was found between mindfulness and the subjective measure (self-recall of performance under pressure) as those high in mindfulness may tend to focus more on external stimuli (e.g., the physical environment around them) as opposed to internal stimuli (e.g., ruminating on past, present, or future performance), and as such little thought is given to subjective beliefs around performance. As Masters and Maxwell (2008) acknowledge, “attention that is focused internally inevitably generates self-evaluation by individuals of whether their current standard of performance matches the standard of performance that they have as a goal” (p. 160). For those high performers who are highly mindful, it may be that they have less internal focused attention (i.e., less focus towards their feelings, or less rumination regarding their performance).

Decision Reinvestment and Performance

Exploring hypotheses 3a, 3b, 4a, and 4b, current research that explores decision reinvestment suggests that those individuals who are higher in reinvestment are more likely to perform poorly under pressure (Laborde, Raab, & Kinrade, 2014; Malhotra, Poolton, Wilson, Ngo, & Masters, 2012; Masters & Poolton, 2012; Poolton et al., 2011). In the current study, it was hypothesised that decision reinvestment would have a negative relationship with performance at both the subjective (self-recall of performance under pressure) and objective (actual performance) level. The results indicated that there was a significant negative correlation between both of these variables; however, only in the corporate sample.

These results, for the corporate sample, highlight the significant role that decision reinvestment plays in reducing actual performance level, as well as self-reported beliefs of performance under pressure, and can be discussed/ understood in light of working memory and skill acquisition. Research suggests that when in high pressure situations, uncertainties regarding the situation, in addition to its consequences, result in the mind trying to “... compete for working memory resources” (Kinrade, Jackson, & Ashford, 2010, p. 313). For example, Beilock (2007) acknowledged that “... pressure exerts two effects such that a performer’s working memory is consumed by worries *and* they are enticed into paying more attention to the step-by-step processes that govern performance” (as cited in

Kinrade, Jackson, Ashford, et al., 2010, p. 1133). It is suggested that the extent to which these processes impact performance is dependent upon the difficulties of the task at hand. In line with decision reinvestment, it can be argued that this is taxing on cognitive processes, as Kinrade, Jackson, Ashford, et al. (2010) suggest

Decision-making in time-constrained, complex environments conceivably involves elements that place significant demands on working memory (e.g., implementation and evaluation of a game plan or strategy) as well as more proceduralized elements that *run off* with minimal conscious involvement... (p. 1133).

The extent to which decision reinvestment consumes working memory, can determine the extent to which performance may be impaired. Research indicates that those individuals who can engage in effective decision making under pressure, to the extent that there is limited disruption to the process, have more positive outcomes such as better relationships/ friendships, greater work satisfaction and performance, and enhanced mental health in comparison to those who do not (Rosenbloom et al., 2012). The current study highlights how high levels of reinvestment are negatively related to performance level. This may be no surprise given that the presence of pressure is a significant trigger for the engagement of conscious control strategies or ruminative thought (Birrer et al., 2012; Laborde, Raab, et al., 2014; Masters & Maxwell, 2008). Therefore, individuals high in reinvestment are perhaps less likely to climb the corporate ladder.

While the results for the athletic sample were not significant, this may be explained due to a lack of power in the sample (de Vaus, 2004) and so it cannot be dismissed that this relationship may also be found within this sample.

Movement Reinvestment and Performance

Movement reinvestment is widely associated with physical motor movements, and is defined as the “manipulation of conscious, explicit, rule based knowledge, by working memory, to control the mechanics of one’s movements during motor output” (Masters & Maxwell, 2004, p. 208). It was hypothesised that movement reinvestment would have a negative relationship with subjective recall of performance under pressure and performance level for both the corporate and

the athletic samples (Hypotheses 5a, 5b, 6a, and 6b), such that those higher in movement reinvestment show lower levels of subjective recall of performance under pressure and lower levels of performance. Given that in the corporate industry performance is primarily based on cognitive performance, opposed to physical or motor performance, this may explain why no significant finding was found for the corporate sample. Interestingly, the opposite correlation was found for the athletic sample than predicted. This relationship, however, was not significant and, therefore, failed to support the hypothesis.

Moderation Analyses

Current research has empirically demonstrated that mindfulness plays a positive role in performance, while decision reinvestment and movement reinvestment plays a negative role. Consistent with this literature, it was hypothesised that decision reinvestment and movement reinvestment would moderate the relationship between mindfulness and subjective recall of performance under pressure (Hypotheses 7a, 7b, 9a, 9b) and performance level (Hypotheses 8a, 8b, 10a, 10b) for both samples.

The results of the study found no significant moderation effect between mindfulness and decision reinvestment or movement reinvestment on the subjective measure of performance (subjective recall of performance under pressure), suggesting that levels of decision reinvestment and movement reinvestment did not influence the relationship between mindfulness and subjective recall of performance under pressure. A significant moderation effect was, however, found between mindfulness and decision reinvestment and the objective measure of performance (performance level) for the corporate sample only. No significant moderation effect was found for movement reinvestment in either sample.

The results indicated that those corporate participants who were high in mindfulness and high in decision reinvestment, showed greater performance level than those who were low in mindfulness but high in reinvestment, supporting Hypothesis 8a, that decision reinvestment would moderate the relationship between mindfulness and performance level. This result appears to show decision reinvestment acting as a 'splitting factor', which causes performance level to be either very high or catastrophically low (refer back to p.41 for the two-way

interaction plot), and warrants discussion in relation to Cusp Catastrophe Theory (Fazey & Hardy, 1988).

In its original development within the performance context, Cusp Catastrophe Theory was used to illustrate the relationship between cognitive anxiety, physiological arousal, and performance among athletes. The nature of the interaction between anxiety and arousal was thought to determine whether a performer experienced minor declines in performance, or extreme declines - described as 'catastrophic in nature' (Cox, 2012, p. 186). Despite being highly complex, Cusp Catastrophe Theory provides a three-dimensional illustration of the moderating interaction within the current study as displayed in Figure 5 p.41 and Figure 6 p.48. Cusp Catastrophe highlights that a single dependent variable (e.g., performance level in the current study) can display continuous and discontinuous changes (i.e., high or low performance levels) in direct response to a constant change among two other independent variables (e.g., decision reinvestment and mindfulness in the current study) (Hardy, 1996). In more general terms, changes in levels of decision reinvestment and mindfulness, significantly impact on the level of performance.

In linking Cusp Catastrophe to the results of the present study, it can be seen that decision reinvestment acts as a splitting factor, while mindfulness determines performance level. Levels of mindfulness regulate how close performance level may be to a critical or 'catastrophic' change. To provide an example, the theory can be used to illustrate how at high and low levels of decision reinvestment, changes in mindfulness can result in a significant drop in performance level. In examining Figure 11, the model suggests that at low levels of decision reinvestment, changes in mindfulness should lead to small and continuous changes in performance level. At high levels of decision reinvestment changes in mindfulness may lead to small changes in performance level when mindfulness is low, but may lead to large changes in performance level when mindfulness is high. Additionally, the model illustrates that at high levels of mindfulness, decision reinvestment has a positive linear relationship with performance level, while at low levels of mindfulness, decision reinvestment has a negative relationship with performance level.

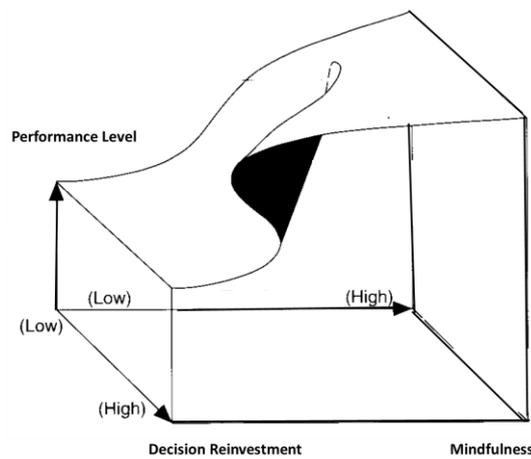


Figure 11. Cusp Catastrophe Model for the present study.

Understanding cusp catastrophe in relation to the present study has strong implications, highlighting that for individuals who are low in mindfulness and high in decision reinvestment, there comes a point when performance level (the objective variable in the current study) reaches a maximum level before dropping off. For corporate leaders this may mean that for those who are high in decision reinvestment and low in mindfulness there comes a point when they are likely to reach maximum leadership potential. Conversely, those high in reinvestment and high in mindfulness are more likely to continue to climb the corporate ladder and reach those higher levels of leadership (i.e., CEO).

Understanding the nature of mindfulness in this relationship could be key to understanding how to improve the performance level of individuals who are high in decision reinvestment. This finding warrants the need for future research to examine this.

In briefly describing the lack of significant finding between movement reinvestment, mindfulness, and performance, it can be suggested that since performance within the corporate sector is primarily cognitive, as opposed to being measured by physical movements, this may be why movement reinvestment plays no significant role in the relationship between mindfulness and performance. That said, given that movement reinvestment is well established in the sport setting, it is surprising that no significant finding was found for the athletic sample. It may be important to acknowledge, however, that given a low sample size for the athletic sample, this may be a contributing factor to the lack of significant findings (de Vaus, 2004).

Post Hoc Findings

Given the significant moderation finding between mindfulness and decision reinvestment on performance level, it was decided to examine decision reinvestment in its two factors (decision reinvestment and decision rumination) to explore whether a single factor was having more or less of an effect on the relationship. The findings indicated that factor 1, decision reinvestment, which measures an individual's propensity to consciously monitor the processes which occur prior to making a decision (Laborde, Dosseville, et al., 2014), did not significantly moderate the relationship between mindfulness and performance level. Decision rumination, however, which assesses an individual's tendency to think about bad decisions made in the past (Laborde, Dosseville, et al., 2014), significantly moderated the relationship between mindfulness and performance level, indicating a similar relationship to the scale as whole.

Overall, the results suggest that those participants high in mindfulness and high in decision rumination perform exceptionally better than those individuals low in mindfulness and high in decision rumination. These results suggest that while mindfulness is important in performance, and in the clinical setting is known to reduce rumination (Hawley et al., 2014; Koster, De Lissnyder, Derakshan, & De Raedt, 2011), which is important for well-being (Brown & Ryan, 2003), in the corporate setting some level of rumination (as determined by the DSRS) is actually beneficial to performance, provided mindfulness is also present. This new finding has been termed, *mindful rumination*, and it is argued that in the high performance corporate setting, engaging in mindful rumination is beneficial to making an informed decision under pressure and consequently results in greater performance.

Practical Implications

This research explored the influence of mindfulness on performance at both a subjective (self-recall of performance under pressure) and objective (actual performance) level. The results indicated that mindfulness plays a significant role in performance level, suggesting that individuals high in mindfulness are more likely to reach high levels of leadership or seniority within employment. This finding recognises the significance of mindfulness at high levels of performance, and highlights the potential for mindfulness interventions to be used in the future

for enhancing performance at high levels of leadership. Alternatively, mindfulness interventions may be a career development tool used to help lower level employees to rise up the corporate ladder.

Additionally, this research explored high performance leadership from a cognitive perspective (e.g., decision making processes under pressure), which goes above-and-beyond traditional understandings of effective leadership. As mentioned previously, the majority of leadership literature focuses on particular traits or behavioural patterns (Northouse, 2014). The lack of examination of cognitive functioning in relation to decision making processes, however, provided space to explore leaders' abilities to sustain high performance in pressure or evaluative situations in direct relation to cognitive mechanisms; which this study has done.

Introducing notions of reinvestment from sport psychology into I/O psychology literature, this study provides a space for future leadership research to explore and understand performance failure, as well to explore how to enhance performance and reduce mechanisms such as choking under pressure.

Finally, this research has found that some level of rumination, within the corporate setting, is beneficial for performance, and this has been termed *mindful rumination*. In the clinical setting it has been widely argued that mindfulness is beneficial in reducing levels of rumination, which ultimately enhances well-being by reducing or eliminating dysfunctional outcomes such as depression, anxiety, and stress. It appears, however, that in the organisational context, rumination is actually beneficial to performance level, provided there are also high levels of mindfulness. This is a significant implication for understanding what contributes to effective performance at high levels of leadership.

Strengths of the Current Study

The study explored performance at both a subjective (self-recall of performance under pressure) and an objective (actual performance) level. This adds strength to the study, and, to some extent, reduces biases related to self-perceptions of performance; by having an actual level of performance alongside general beliefs. Using two forms of performance adds validity and uniqueness to the study. Additionally, this study used already validated measures for analysing mindfulness and reinvestment, which adds to the validity of the study.

The current study differs from previous research, as it explored conditions of mindfulness and highlighted where mindfulness is effective within high performance leadership. Specifically, the study showed that in relation to decision reinvestment, mindfulness is hugely instrumental in enhancing levels of corporate performance. Additionally, the research has translated notions of *reinvestment* from the sport psychology literature into the organisational psychology literature, which is a first, and thus opens a platform for future research to examine this. The research has demonstrated the complex relationship between mindfulness and decision reinvestment, such that decision reinvestment acts as a splitting factor, causing performance to be either very high or very low at different levels of mindfulness. This was discussed in relationship to Cusp Catastrophe Theory and is worthy of future research.

This research adds to the current literature which suggests that mindfulness is beneficial for performance; however, it adds a new concept, *mindful rumination*, which suggests that at high levels of performance, rumination regarding decision making under pressure is beneficial, but only to the extent that there is high levels of mindfulness.

Limitations of the Current Study

The current study lacked a large sample size for the athletic sample, and this, therefore, influenced the power of the sample, and consequently may have contributed to the non-significant findings for the sample (de Vaus, 2004). The sample size could have been larger had there not been strict time constraints for data collection.

The variance associated with the measurement method used in the current study, widely known as Common Method Variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) is a limitation which may have resulted in misleading results. Given that the study used a self-report method this produces variances in responses associated with, for example, halo effects and social-desirability (e.g., participants portraying themselves in a more positive light). Despite anonymity, and encouraging honest participation, participants may not have answered all questions in an honest manner, and this, therefore, is important to remember when interpreting the results.

The questionnaire was not tailored to sports and corporate participants separately. Questions regarding decision reinvestment and movement

reinvestment were general, and not in direct relation to sporting performance or corporate performance. This may have influenced responses. It may be possible that an individual experiences different decision making styles or understanding of movements in a sports setting than in a corporate setting.

Finally, in respect to the objective measure (performance level) it is important to note that it was acknowledged that there is the possibility of having an individual hold a high level of seniority, yet be an ineffective leader, or perform poorly, and vice-versa. While this measure may be seen as a limitation, the objective measure indicates that high levels of performance may be required. For example, it is likely that a Director of an organisation will be required to engage in complex decision making, which may be vital to the functioning of the organisation. This same requirement for a general employee is less likely. Moreover, as this study is examining performance under pressure, it is unlikely that those individuals at the lower levels of performance within the corporate and the sports sectors are placed within such highly pressurised or evaluative situations.

Future Research

The current study highlights that in corporate settings decision rumination is beneficial to performance, but only when there are high levels of mindfulness, this warrants future intervention studies to conduct mindfulness interventions for enhancing levels of mindfulness; particularly for those individuals who are high in decision reinvestment or decision rumination. Alternatively, other interventions may be explored and used for those who are already high in mindfulness but lack mindful rumination. Future research may wish to explore how mindful rumination may be encouraged. For example, leadership coaches may encourage mindful rumination, such that rumination regarding a decision is carried out for a short 'mindful' period, before then letting go of the thoughts.

Given the introduction of reinvestment theory in the current study, and to the I/O psychology discipline, this lays a foundation for future research to continue exploring notions of reinvestment in organisational life. Additionally, reinvestment literature provides insight into ways of enhancing performance and reducing the likeliness of reinvestment (see for a review, Masters & Poolton, 2012). As an example, future research may wish to explore how leadership coaches can utilise programs that encourage implicit mechanisms/programs of

instruction to reduce reinvestment. It is suggested that implicit approaches to learning, which have been developed to ameliorate the effects of reinvestment in populations with movement problems, may be more effective than explicit approaches (i.e., rules or instruction), and may help individuals in organisations to perform better under conditions of pressure or evaluation, and thus warrants further examination.

The results of the study showed decision reinvestment and decision rumination acting as a ‘splitting factor’, causing performance to be either very high or very low, and this was discussed in relation to Cusp Catastrophe Theory. Given that Cusp Catastrophe has not been utilised within the organisational or behavioural context for some time, with the last documented articles dating back to the early 80’s (see Guastello, 1982; Sheridan & Aberson, 1983), the findings of the current study warrant its further exploration.

Finally, while this research examined performance under pressure, pressure was estimated based on a self-perception question as well as performance level. Future research may wish to examine pressure within an experimental context, perhaps by inducing pressure situations and exploring how these situations relate to mindfulness or may trigger reinvestment. Additionally, future research may wish to define pressure more specifically (i.e., time pressure), and explore notions of mindfulness and reinvestment within these specific pressure contexts.

Concluding Remarks

In conclusion, the current study investigated the relationship between mindfulness, reinvestment, and performance, at both a subjective (self-recall of performance under pressure) and objective (actual performance) level, across two samples in which high performance is critical. The research demonstrates that mindfulness plays a significant role in performance level for corporate leaders. Moderation and post-hoc analyses found that mindfulness and decision reinvestment appeared to function together, and that for those individuals who are high in decision reinvestment or decision rumination, performance level (e.g., corporate leadership) can be significantly increased if there is also high levels of mindfulness. The results emphasise a newly developed term, *mindful rumination*, and the importance of this for high performance leaders.

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Appendix A

High Performance Leaders: The Influence of Reinvestment and Mindfulness

Section 1: Academic Background

(1) Please indicate which of the following best describes your academic background.

- Currently studying (Sport and Leisure)
- Currently studying (Management)
- Currently on Sir Edmund Hillary Scholarship Programme
- Alumni (Sport and Leisure)
- Alumni (Management)
- Alumni (Sir Edmund Hillary Scholarship Programme)
- Other (please specify: _____)

Section 2: Performance in Sport/ Art

(1) Do you currently participate in a sport/ art?

Yes

No (move on to section 3)

(2) If you answered 'yes' to Question (1), which sport/art do you play? If you play multiple sports/ arts seriously, please indicate your main focus.

(3) Thinking about your participation in your main sport/ art, what is the highest level that you have played/ performed?

- International
- Multinational (e.g., Super Rugby)
- National
- Regional
- University Sports/ Arts Club
- Local Sports/ Arts Club
- Interschool
- Social
- Non Competitive

(4) Imagine yourself participating in an important event in your sport/ art. How likely are you to overthink/ underthink because of the pressure? Answer as honestly as possible.

- Highly Likely
- Likely
- Somewhat Likely
- Somewhat Unlikely
- Unlikely
- Highly Unlikely

(5) Would you expect this overthinking/ underthinking to make you perform:

- Better
- Worse

(6) Recall the last time that you participated in a very important competition/ performance. Relative to what you know was your best ability at the time, did you underperform or overperform?

- | | |
|---------------------------|--------------------------|
| Extreme overperformance | <input type="checkbox"/> |
| Moderate overperformance | <input type="checkbox"/> |
| Slight overperformance | <input type="checkbox"/> |
| No change | <input type="checkbox"/> |
| Slight underperformance | <input type="checkbox"/> |
| Moderate underperformance | <input type="checkbox"/> |
| Extreme underperformance | <input type="checkbox"/> |

Section 3: Performance in Corporate Settings

(1) Thinking about your own employment, what is the highest position that you have held in an organisation?

- | | |
|-------------------------------|--------------------------|
| Director | <input type="checkbox"/> |
| C-Suite Manager (e.g., CEO) | <input type="checkbox"/> |
| Senior Manager | <input type="checkbox"/> |
| Regional Manager | <input type="checkbox"/> |
| General Manager | <input type="checkbox"/> |
| Supervisor | <input type="checkbox"/> |
| Team Leader | <input type="checkbox"/> |
| General Employee | <input type="checkbox"/> |
| Other (please specify): _____ | |

(2) Imagine yourself participating in an important event, such as a business meeting/ presentation. How likely are you to overthink/ underthink because of the pressure? Answer as honestly as possible.

- Highly Likely
- Likely
- Somewhat Likely
- Somewhat Unlikely
- Unlikely
- Highly Unlikely

(3) Would you expect this overthinking/ underthinking to make you perform:

- Better
- Worse

(4) Recall the last time that you performed in a very important event. Relative to what you know was your best ability at the time, did you underperform or overperform?

- Extreme overperformance
- Moderate overperformance
- Slight overperformance
- No change
- Slight underperformance
- Moderate underperformance
- Extreme underperformance

Section 4: Decision-Reinvestment Questions.

Below are a number of statements about your decision making. The possible answers go from 'extremely uncharacteristic' to 'extremely characteristic'. There are no right or wrong answers so tick the answer that best describes how you feel for each question.

(1) I'm always trying to figure out how I make decisions.

- Extremely Uncharacteristic (0)
- (1)
- (2)
- (3)
- Extremely Characteristic (4)

(2) I'm concerned about my style of decision-making.

- Extremely Uncharacteristic (0)
- (1)
- (2)
- (3)
- Extremely Characteristic (4)

(3) I remember poor decisions I make for a long time afterwards.

- Extremely Uncharacteristic (0)
- (1)
- (2)
- (3)
- Extremely Characteristic (4)

(4) I'm constantly examining the reasons for my decisions.

- Extremely Uncharacteristic (0)
- (1)
- (2)
- (3)
- Extremely Characteristic (4)

(5) I get “worked up” just thinking about poor decisions I have made in the past.

- | | |
|--------------------------------|--------------------------|
| Extremely Uncharacteristic (0) | <input type="checkbox"/> |
| (1) | <input type="checkbox"/> |
| (2) | <input type="checkbox"/> |
| (3) | <input type="checkbox"/> |
| Extremely Characteristic (4) | <input type="checkbox"/> |

(6) I sometimes have the feeling that I’m observing my decision-making process.

- | | |
|--------------------------------|--------------------------|
| Extremely Uncharacteristic (0) | <input type="checkbox"/> |
| (1) | <input type="checkbox"/> |
| (2) | <input type="checkbox"/> |
| (3) | <input type="checkbox"/> |
| Extremely Characteristic (4) | <input type="checkbox"/> |

(7) I often find myself thinking over and over about poor decisions that I have made in the past.

- | | |
|--------------------------------|--------------------------|
| Extremely Uncharacteristic (0) | <input type="checkbox"/> |
| (1) | <input type="checkbox"/> |
| (2) | <input type="checkbox"/> |
| (3) | <input type="checkbox"/> |
| Extremely Characteristic (4) | <input type="checkbox"/> |

(8) I think about better decisions I could have made long after the event has happened.

- | | |
|--------------------------------|--------------------------|
| Extremely Uncharacteristic (0) | <input type="checkbox"/> |
| (1) | <input type="checkbox"/> |
| (2) | <input type="checkbox"/> |
| (3) | <input type="checkbox"/> |
| Extremely Characteristic (4) | <input type="checkbox"/> |

(9) I am alert to changes in how much thought I give to my decisions.

- Extremely Uncharacteristic (0)
- (1)
- (2)
- (3)
- Extremely Characteristic (4)

(10) I'm aware of the way my mind works when I make a decision.

- Extremely Uncharacteristic (0)
- (1)
- (2)
- (3)
- Extremely Characteristic (4)

(11) I rarely forget the times when I have made a bad decision, even about the minor things.

- Extremely Uncharacteristic (0)
- (1)
- (2)
- (3)
- Extremely Characteristic (4)

(12) When I am reminded about poor decisions I have made in the past, I feel as if they are happening all over again.

- Extremely Uncharacteristic (0)
- (1)
- (2)
- (3)
- Extremely Characteristic (4)

(13) I'm concerned about what other people think of the decisions I make.

- | | |
|--------------------------------|--------------------------|
| Extremely Uncharacteristic (0) | <input type="checkbox"/> |
| (1) | <input type="checkbox"/> |
| (2) | <input type="checkbox"/> |
| (3) | <input type="checkbox"/> |
| Extremely Characteristic (4) | <input type="checkbox"/> |

Section 5: Everyday Experiences Questions

Below is a collection of statements about your everyday experience. Using the scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be.

(1) I could be experiencing some emotion and not be conscious of it until some time later.

- | | |
|-----------------------|--------------------------|
| Almost always | <input type="checkbox"/> |
| Very frequently | <input type="checkbox"/> |
| Somewhat frequently | <input type="checkbox"/> |
| Somewhat infrequently | <input type="checkbox"/> |
| Very infrequently | <input type="checkbox"/> |
| Almost never | <input type="checkbox"/> |

(2) I break or spill things because of carelessness, not paying attention, or thinking of something else.

- | | |
|-----------------------|--------------------------|
| Almost always | <input type="checkbox"/> |
| Very frequently | <input type="checkbox"/> |
| Somewhat frequently | <input type="checkbox"/> |
| Somewhat infrequently | <input type="checkbox"/> |
| Very infrequently | <input type="checkbox"/> |
| Almost never | <input type="checkbox"/> |

(3) I find it difficult to stay focused on what's happening in the present.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(4) I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(5) I tend not to notice feelings of physical tension or discomfort until they really grab my attention.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(6) I forget a person's name almost as soon as I've been told it for the first time.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(7) It seems I am "running on automatic" without much awareness of what I'm doing.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(8) I rush through activities without being really attentive to them.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(9) I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(10) I do jobs or tasks automatically, without being aware of what I'm doing.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(11) I find myself listening to someone with one ear, doing something else at the same time.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(12) I drive places on "automatic pilot" and then wonder why I went there.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(13) I find myself preoccupied with the future or the past.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(14) I find myself doing things without paying attention.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

(15) I snack without being aware that I'm eating.

- Almost always
- Very frequently
- Somewhat frequently
- Somewhat infrequently
- Very infrequently
- Almost never

Section 6: Movement Specific Questions.

Below are a number of statements about your movements in general. The possible answers go from 'strongly disagree to 'strongly agree'. There are no right or wrong answers so tick the answer that best describes how you feel for each question.

(1) I remember the times when my movements have failed me.

- Strongly disagree
- Moderately disagree
- Weakly disagree
- Weakly agree
- Moderately agree
- Strongly agree

(2) If I see my reflection in a shop window, I will examine my movements.

- Strongly disagree
- Moderately disagree
- Weakly disagree
- Weakly agree
- Moderately agree
- Strongly agree

(3) I reflect about my movement a lot.

- Strongly disagree
- Moderately disagree
- Weakly disagree
- Weakly agree
- Moderately agree
- Strongly agree

(4) I try to think about my movements when I carry them out.

- Strongly disagree
- Moderately disagree
- Weakly disagree
- Weakly agree
- Moderately agree
- Strongly agree

(5) I am self-conscious about the way I look when I am moving.

- Strongly disagree
- Moderately disagree
- Weakly disagree
- Weakly agree
- Moderately agree
- Strongly agree

(6) I sometimes have the feeling that I am watching myself move.

- Strongly disagree
- Moderately disagree
- Weakly disagree
- Weakly agree
- Moderately agree
- Strongly agree

(7) I am aware of the way my body works when I am carrying out a movement.

- Strongly disagree
- Moderately disagree
- Weakly disagree
- Weakly agree
- Moderately agree
- Strongly agree

(8) I am concerned about my style of moving.

- Strongly disagree
- Moderately disagree
- Weakly disagree
- Weakly agree
- Moderately agree
- Strongly agree

(9) I try to figure out why my actions failed.

- Strongly disagree
- Moderately disagree
- Weakly disagree
- Weakly agree
- Moderately agree
- Strongly agree

(10) I am concerned about what people think about me when I am moving.

- | | |
|---------------------|--------------------------|
| Strongly disagree | <input type="checkbox"/> |
| Moderately disagree | <input type="checkbox"/> |
| Weakly disagree | <input type="checkbox"/> |
| Weakly agree | <input type="checkbox"/> |
| Moderately agree | <input type="checkbox"/> |
| Strongly agree | <input type="checkbox"/> |

Section 7: Mindfulness Questions.

Below are a number of statements related to an aspect of mindfulness. The possible answers go from 'never or very rarely true' to 'very often or always true'. There are no right or wrong answers so select the answer that best describes how you feel for each question.

(1) I'm good at finding the words to describe my feelings.

- | | |
|---------------------------|--------------------------|
| Never or very rarely true | <input type="checkbox"/> |
| Rarely true | <input type="checkbox"/> |
| Sometimes true | <input type="checkbox"/> |
| Often true | <input type="checkbox"/> |
| Very often or always true | <input type="checkbox"/> |

(2) I can easily put my beliefs, opinions, and expectations into words.

- | | |
|---------------------------|--------------------------|
| Never or very rarely true | <input type="checkbox"/> |
| Rarely true | <input type="checkbox"/> |
| Sometimes true | <input type="checkbox"/> |
| Often true | <input type="checkbox"/> |
| Very often or always true | <input type="checkbox"/> |

(3) It's hard for me to find the words to describe what I'm thinking.

- Never or very rarely true
- Rarely true
- Sometimes true
- Often true
- Very often or always true

(4) I have trouble thinking of the right words to express how I feel about things.

- Never or very rarely true
- Rarely true
- Sometimes true
- Often true
- Very often or always true

(5) When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

- Never or very rarely true
- Rarely true
- Sometimes true
- Often true
- Very often or always true

(6) Even when I'm feeling terribly upset, I can find a way to put it into words.

- Never or very rarely true
- Rarely true
- Sometimes true
- Often true
- Very often or always true

(7) My natural tendency is to put my experiences into words.

- Never or very rarely true
- Rarely true
- Sometimes true
- Often true
- Very often or always true

(8) I can usually describe how I feel at the moment in considerable detail.

- Never or very rarely true
- Rarely true
- Sometimes true
- Often true
- Very often or always true

Thank you for participating in this questionnaire.

If you wish to receive a summary of the overall results please email me jah57@students.waikato.ac.nz with the subject heading: *High Performance Research Results*. Results will be expected to be emailed out early-mid 2016.

Appendix B

Invitation letter to invite potential participants.

Hi [insert appropriate title],

I am a psychology graduate student at the University of Waikato. As part of my Master's thesis I am undertaking research on high performance leaders. The aim of my research is to explore associations between high performance and theories of reinvestment and mindfulness, in evaluative or pressure situations among sports/ arts leaders and corporate leaders.

I have created an online questionnaire designed to assess these different variables and would like to invite you to help in recruiting participants by forwarding on my contact details along with an invitation to participate in the research, to potential participants (for example your students).

Your help would be hugely appreciated, however, is completely voluntary.

In the event that you forward my contact details to potential participants, I ask that you copy and paste the text at the end of this email, which outlines the research, and provides an electronic link to the questionnaire.

If you have any questions regarding this research or the questionnaire please feel free to contact myself or my supervisors.

Additionally, if you are personally interested in participating in the research, please click the electronic link below which directs you to an information sheet which details the research and your rights as a participant, and access to the questionnaire.

Kindest regards,
Jacinda Herring
(jah57@students.waikato.ac.nz)

Supervisors:

Dr. Maree Roche (mroche@waikato.ac.nz)

Prof. Rich Masters (rmasters@waikato.ac.nz)

To go to the questionnaire please click here: [electronic link to questionnaire]

Please note that the questionnaire has been set up to be mobile friendly, however, it may not display correctly on all mobile devices. If you have any issues using your mobile device to complete the questionnaire you may need to try using a computer.

This research project has been approved by the Psychology of Research and Ethics Committee at the University of Waikato. Any questions about the ethical conduct of this research may be sent to the convenor of the Psychology Research and Ethics Committee (Dr James McEwan, Tel: 07 838 4466 ext 8295, email: jmcewan@waikato.ac.nz)

[COPY AND PASTE THE BELOW TEXT]

Hi there,

I am a psychology graduate student at the University of Waikato. As part of my Master's thesis I am undertaking research on high performance leaders. The aim of my research is to explore associations between high performance and theories of reinvestment and mindfulness, in evaluative or pressure situations among sports/ arts leaders and corporate leaders.

I have created an online questionnaire designed to assess these different variables and would like to invite you to participate in the research.

The questionnaire is completely voluntary, and if you decide to participate in this research you have the right to refuse to answer any particular question(s). Additionally, the questionnaire is designed to be completely confidential, so does not require you to provide your name or any other personal details which may make you identifiable.

The questionnaire is relatively short and should take approximately 5-10 minutes to complete.

If you are interested in completing the questionnaire please click the link at the end of this email which will direct you to an information sheet where you can then continue on to complete the questionnaire.

If you have any questions regarding this research or the questionnaire please feel free to contact myself or my supervisors.

Kindest regards,
Jacinda Herring
(jah57@students.waikato.ac.nz)

Supervisors:
Dr. Maree Roche (mroche@waikato.ac.nz)
Prof. Rich Masters (rmasters@waikato.ac.nz)

To go to the questionnaire please click here: [electronic link to questionnaire]
Please note that the questionnaire has been set up to be mobile friendly, however, it may not display correctly on all mobile devices. If you have any issues using your mobile device to complete the questionnaire you may need to try using a computer.

This research project has been approved by the Psychology of Research and Ethics Committee at the University of Waikato. Any questions about the ethical conduct of this research may be sent to the convenor of the Psychology Research and Ethics Committee (Dr James McEwan, Tel: 07 838 4466 ext 8295, email: jmcewan@waikato.ac.nz)

Appendix C

Groups or pages which the questionnaire was distributed:

- The University of Waikato (UoW) Alumni
- UoW Faculty of Arts and Social Sciences
- UoW Waikato Management School
- UoW Corporate and Executive Education Alumni
- UoW Sport and Leisure Studies
- UoW Psychology Students Association
- UoW I/O Psychology Graduates