

Demanding Success: Examining the Effects of Rational Emotive Behaviour Therapy on
Performance-Related Outcomes

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A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of
Philosophy awarded by Staffordshire University

December 2017

Abstract

Rational Emotive Behavior Therapy (REBT) is a psychotherapeutic approach based on the premise that when faced with adversity, irrational beliefs determine unhealthy negative emotions and maladaptive behaviors, whereas rational beliefs lead to healthy and adaptive alternatives. Using the ABC(DE) model the process of REBT aims to dispute and replace irrational with rational beliefs, ultimately providing a model of human functioning. Although the detrimental effects of irrational beliefs on psychological health are established, less is known about the deleterious effects on human behavior and performance. The thesis adds to the extant literature in two ways. First, the primary aim of this thesis were to examine effects of REBT, and irrational and rational self-statements on performance-related outcomes. A secondary aim of the thesis was to provide an insight into the effective application of REBT with elite athletes, and those with a physical disability. Using the context of sport, five studies were conducted in this thesis. Three applied field-based studies were conducted in Part I, exploring the effects of REBT on psychological, physiological, and performance outcomes in elite athletes. The findings indicated the effects of REBT (i.e., irrational beliefs, self-efficacy, perception of control, physiological markers, and performance markers) were most evident when delivered to an athlete on an individual basis and with a greater number of sessions. Data also indicated when the delivery of REBT was individually specific and sufficient in dose the effects on IBs and associated outcomes were immediate and maintained, signifying a fundamental shift towards a rational view of adversity (e.g., failure, setbacks, and rejection). In Part II, two experimental studies were conducted to examine the effects of irrational and rational self-statements on markers of performance. In contrast to findings from Part I the results showed no distinction in psychological (anxiety), physiological (heart rate), cognitions (eye gaze data), and performance outcomes (BHT and HPT) between irrational and rational approaches to an acute competitive task. Collectively

the thesis findings provide partial support to a growing evidence-base demonstrating the value of REBT as an effective means of enhancing an athlete's psychological approach and response to adversity/challenge (e.g., competition). The findings also offer a nuanced view between IBs/RBs and maladaptive/adaptive responses to adversity, overcoming what appears to be an overly simplistic dichotomy depicted within previous literature that IBs hinder, whereas RBs are wholly adaptive towards performance. Meeting the second thesis aim, in Chapter 7 valuable professional practice insights into the effective application of REBT with elite athletes and those with a physical disability were discussed. Elite sport and performance contexts are inherent with challenges and practitioners would be prudent to balance the short and long-term benefits of REBT on performance, and the detrimental effects of IBs on psychological health. Ultimately, research that examines the efficacy of interventions originally conceived within clinical settings such as REBT mark a shift in perspective for effective psychological support and alter the boundaries of techniques available to practitioners. Limitations and recommendations for future researchers are provided.

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Acknowledgments

My PhD journey began on the 5th of January 2014. I am extremely fortunate to have been encouraged, supported, and directed by a number of people during my PhD Journey. I would therefore like to take this opportunity to thank those who made the completion of the PhD not only bearable, but a positive and meaningful experience on which I will look back with many fond memories.

I must first extend my gratitude to my supervisory team of Associate Professor Jamie Barker and Dr Martin Turner. Their continued guidance, encouragement, and expertise has contributed substantially to the richness of the thesis. As a supervisory team their enthusiasm to ensure the PhD journey was one filled with as many jokes as there were academic challenges is certainly an approach I will carry with me from here forwards. Notwithstanding the realms of the PhD I was also welcomed and immersed into a vibrant world of sport psychology, being offered extensive opportunities not typically afforded to a PhD student.

My deepest appreciations and love extend to my other half Aimee, who was both instrumental in encouraging me to undertake the PhD and ensured I crossed the finish line with gentle encouragement and numerous cups of tea. She certainly did not sign up to a PhD and I thank her for sticking with me during my many absences, passively listening to my research ‘updates’, and my incessant excuses to not spend time with her. I am looking forward to paying back some, if not all of the time that we should have spent together on various adventures.

I would also like to thank John Wood for his relentless and unconditional support for whatever endeavours I have followed. He has provided a blue-print for parental support and without him I would not have been able to pursue such a meaningful, rewarding, and yet challenging line of work.

Special thanks should also be extended to Dr Matthew Slater for his friendship, continued guidance, and his unique ability to model both healthy anger and rage for the ‘images of research competition’. I would also like to thank all the PhD students, sport and exercise colleagues, and the technical support staff (Mark Bailey & Sarah Higgins) who I have worked alongside, providing me with much wisdom, the utmost patience, and plenty of moral support.

I would like to thank all those who have offered their time to help conduct or participate in my research.

Finally, I would like to thank the individual who stole my decrepit laptop at the end of my first year. In doing this they inadvertently coerced me into buying a new and improved laptop that undoubtedly facilitated my ability to spin the many plates associated with the PhD process.

Andrew

(December, 2017)

Publications and Presentations Based on Thesis Material

The research reported in the present thesis has contributed to the following publications and dissemination activities:

Journal Publications

Wood, A.G., Barker, J.B., & Turner, M.J. (2017). A case study with an elite archer:

Developing performance using rational emotive behaviour therapy (REBT). *The Sport Psychologist*, 31, 78-88.

Wood A.G., Turner, M. T., & Barker, J.B. (in press). Investigating the influence of irrational self-statements on visual search behaviour, persistence and skilled motor performance. *Sport, Exercise, and Performance Psychology*, accepted 30th of March 2017.

Wood, A.G., Barker, J. B., & Turner, M. J. (in press). Examining the effects of rational emotive behaviour therapy on performance outcomes in elite Paralympic athletes. *Scandinavian Journal of Medicine and Science in Sports*, accepted 25th of May 2017.

Wood, A.G., Barker, J. B., & Turner, M. T. The Effects of a Rational Emotive Behaviour Therapy (REBT) workshop on Performance in Elite Blind Footballers. Manuscript submitted for peer review.

Book Chapters

Wood, A.G., Barker, J. B., & Turner, M. T. (2017). *Rational Emotive Behaviour Therapy to Help Young Athletes Build Resilience and Deal with Adversity*. In C. Knight & C. Harwood & D. Gould (Eds.). *Sport psychology for young athletes*. Routledge.

Wood, A.G., & Woodcock, C. (2017). “Is it really that bad” A case study applying Rational Emotive Behaviour Therapy (REBT) with an Elite Youth Tennis Player.

Wood A.G., Turner, M. T., & Barker, J.B. (In press). *Using Rational Emotive Behaviour Therapy to Promote Psychological Wellbeing with a Paralympic Athlete*. In G. Breslin, & H. Leavey (Eds.). *Mental health and well-being interventions in sport: A case study analysis*.

Dissemination

Wood, A.G. (2017). Irrational Beliefs in Sport – Helpful or a Hindrance? Oral presentation delivered at Psychology in the Pub, British Psychological Society: West Midlands Branch, Stoke-on-Trent.

Wood, A.G., Barker, J.B., & Turner, M. J. (2016). Examining the Effects of Rational Emotive Behaviour Therapy on Performance in Elite Paralympic Athletes. Oral presentation delivered at the British Psychological Societies Annual Division of Sport and Exercise Psychology Conference, Cardiff.

Wood, A.G., Barker, J.B., & Turner, M. J. (2016). Investigating the Effects of Rational and Irrational Cognitions on Performance: Testing the Predictions of Rational Emotive Behaviour Therapy. Oral presentation delivered at the West Midlands British Psychological Society Conference, Birmingham.

Wood, A.G., Barker., J. B., & Turner, M. J. (2015). The Effects of a Single Integrated Rational Emotive Behaviour Therapy (REBT) on Penalty Shootout Performance in Elite Blind Footballers. Poster presented at the Division of Sport and Exercise Psychology Conference, Leeds.

Wood, A.G., Barker., J. B., & Turner, M. J. (2015). Irrational Beliefs, Helpful or a Hindrance? Five-minute challenge. Oral presentation delivered at the Division of Sport and Exercise Psychology Conference, Leeds.

Wood, A.G., Barker, J.B., Turner, M.T., & Woodcock, C. (2015) “Smarter Thinking”. Presented at the Images of Research Competition, Staffordshire University.

- Wood, A.G.** (2015). "I must be successful" – Investigating the influence of irrational beliefs on performance in elite athletes. *West Midlands Branch Newsletter*, 4, 11-12.
- Wood, A.G.**, Turner, M. J. & Barker, J.B. (2015). Exploring the Effect of Rational Emotive Behaviour Therapy on Irrational Beliefs and Performance in Elite Paralympic Athletes. Oral Presentation delivered at the West Midlands British Psychological Society Conference, Coventry.
- Wood, A.G.**, Barker., J. B., & Turner, M. J. (2015). 'I Must be Successful'. Three-minute thesis presentation delivered at the Glyndwr & Staffordshire University Joint Conference. (Runner-up), Stoke-on-Trent.
- Wood, A.G.**, Barker., J. B., & Turner, M. J. (2015). Exploring the Effects Irrational Beliefs on Athletic Performance. Oral presentation delivered at the Glyndwr & Staffordshire University Joint Conference, Stoke-on-Trent.
- Wood, A.G.**, Turner, M. J., & Barker, J. B. (2015). A Case Study With an Elite Archer: Developing Performance Using Rational Emotive Behaviour Therapy (REBT). Oral presentation delivered at the Association for Applied Sport Psychology Student Conference (Winner of Best Oral Presentation), Loughborough.

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Chapter 1

Thesis Overview

1.1 Introduction

A belief is proposed to represent an evaluation or opinion on a subject, open to cognitive biases with the appearance of being true (Shermer, 2011). Indeed, the ability to hold beliefs in fictitious or created entities is considered instrumental in ensuring the functioning, development, and survival of homosapiens over the extinction of other human species (Harari, 2014). Beliefs provide a guidebook to reality, an imagined order, helping humans to understand what is right and wrong, how to behave, and are thus central to one's personality (i.e., a set of psychological qualities which are enduring and make us distinct in the way we think feel and behave).

The underlying theoretical foundations of this PhD thesis is Rational Emotive Behaviour Therapy (REBT; Ellis, 1957), which holds that rather than the adversity, it is one's beliefs about that adversity that determines the functionality of how we respond and strive towards goal achievement. In this thesis and in-line with REBT theory, beliefs are characterised as irrational or rational. Irrational beliefs (IBs) are defined as rigid, extreme, illogical, and dysfunctional for goal achievement. Where instead, rational beliefs (RBs) are flexible, non-extreme, logical, and functional for goal achievement (Dryden & Branch, 2008). All humans have an inherent propensity for both RBs and IBs, which are proposed to have served adaptive functions for human survival and reproduction (David & DiGiuseppe, 2010). Today however, IBs are largely considered detrimental, whilst RBs are considered central for psychological health. Indeed, a great deal is understood about the role of rational and irrational beliefs in psychological health, but in contrast, very little is understood about the role of irrational and rational beliefs in performance. Those operating in performance contexts (e.g., military, emergency services, business) are required to manage a wide variety of cognitive and motor perceptual skills to complete a task and achieve a given goal. As such

contemporary research has attempted to glean insights into human performance across many domains (e.g., business, military, medicine). The area of competitive sport offers a rich and dynamic natural laboratory in which to assess performance and the execution of complex skills within dynamic and ever changing conditions (Moran, 2009). In sport, successful performance is considered in part, a result of how well an athlete is able to psychologically deal with the demands of competition (Jones, Meijen, McCarthy, & Sheffield, 2009). Elite sport also encapsulates a domain that is widespread with irrational and rational beliefs.

1.2 Thesis Organisation

In the present thesis, the effects of REBT on performance-related outcomes were examined using the context of elite sport for two reasons. First, elite sport is demanding, as such REBT offers a promising intervention that provides athletes with the foundations on which to function adaptively and pursue performance excellence when encountered with various stressors. Second, elite sport offers an appropriate laboratory in which to investigate the effects of irrational and rational beliefs on performance. Chapter 2 (literature review) outlines the central tenets of REBT theory, followed by an exploration into the theories that may explain the mechanisms between irrational and rational beliefs and emotional consequences. The review then examines the effects of REBT, and the associations between irrational and rational beliefs on emotional, cognitive, physiological, behavioural, and performance consequences.

To address aim one of the thesis, in Part I, the effects of REBT were ideographically examined on important psychological (e.g., self-efficacy, perception of control, achievement orientation, pre-performance anxiety), physiological (systolic and diastolic blood pressure) and performance markers. An ideographic approach was used to provide an in-depth exploration into the effects of REBT on performance outcomes in elite sport, and contribute

to the emerging professional practice literature. The application and receipt of REBT was also examined (i.e., single-case, pre/post-test cross over design) using both one-to-one and workshop formats within a specialised sample of elite able-bodied and Paralympic athletes within ecologically valid settings. The findings from Part I informed the development of methodological protocols, outcomes measures, and study hypotheses to be examined within Part II. Addressing thesis aim two, in Part II a rigorous and controlled experimental examination (repeated measures counter-balanced design) into the effects of irrational and rational self-statements across a range of performance markers was conducted. Specifically, this included: motor-skill performance, hazard perception performance, cognitive processes (e.g., eye gaze data), task persistence, physiological consequences (e.g., changes in heart rate), and psychological outcomes (e.g., pre-performance anxiety, concentration disruption). Meeting aim three of this thesis, in Chapter 7 professional practice insights into the application of REBT, as well as applied challenges of working with athletes with a physical disability or visual impairment are also discussed in reference to future recommendations. In Chapter 8 the main thesis findings were discussed regarding the aims and objectives, study limitations, and recommendations for future researchers and practice.

1.3 Thesis Aims and Objectives

1. To examine the effects of REBT on key performance indicators and measures of performance (see chapters three- five).

Objectives:

- 1a.** To examine the effects of REBT on psychological, physiological, and performance outcomes.
- 1b.** To conduct an idiographic and applied examination into the effects of REBT within ecologically valid settings.
- 1c.** To investigate the application of REBT using a one-to-one and group based modality.

- 2 To determine the effects of irrational and rational self-statements on performance outcomes (see chapter six).

Objectives:

2a. To examine the effects of irrational and rational self-statements on pre-performance anxiety and motor-skill performance using an experimental research design.

2b. To examine the effects of irrational and rational self-statements on visual search behaviour and task persistence using an experimental research design.

- 3 To explore and understand the applied practice of REBT with elite athletes (see chapters three-five and seven).

Objectives:

3a. To document and glean professional practice insights into the application of REBT using both a one-to-one and group based modality in sport.

3b. To detail professional practice insights into applying REBT with elite able bodied and elite athletes with a disability.

Chapter 2

Literature Review

2.1 Theory of Rational Emotive Behaviour Therapy

2.1.1 History of REBT. REBT is a psychotherapeutic approach developed by Albert Ellis in 1955. Pronounced as the first form of cognitive behaviour therapy (David, Szentagotai, Eva, & Macavei, 2005), one's cognitions, emotions, and behaviours are central in the development and maintenance of psychological health (Dryden & Branch, 2008). Ellis hypothesised that emotional problems were largely results of dysfunctional thinking, that is IBs (DiGiuseppe, Doyle, Dryden & Backx, 2014), therefore proposing that through changing ones core beliefs, emotional problems can be minimised. For example, if one held an irrational belief in respect to success/failure when faced with an important presentation (adversity), this would determine maladaptive emotions (anxiety), behaviours, and cognitions that would hinder goal achievement.

Originally trained as a psychoanalyst, Albert Ellis became disenchanted with this approach after finding that many of his clients failed to improve even after gaining insight into the origins of their disturbances. After drawing upon the readings of ancient Greek and Asian philosophers (e.g., Guatama Buddha, Confucius, Lao Tzu, Marcus Aurelius, Epicurus, Epictetus), Ellis concluded that humans largely contribute to their dysfunctional thinking and feelings. Hereby, endorsing the stoic philosophy that "men are not disturbed by things, but by the view which they take of them" (Epictetus, 55-135 A.D.) as the central tenet to a more effective and efficient form of psychotherapy. Established in 1955 during the cognitive revolution, REBT was originally termed "Rational Therapy" (RT), and was focussed mainly on cognitions. Nevertheless, RT was criticised for an overemphasis on cognitions and suggestions as a surface level intervention (McMahon, 2011). In an attempt to recognise the important role and connection between thoughts and emotions Albert Ellis, added the term "Emotive" (Ellis, 1962). It was not until 1994 that Ellis included the "Behavioural" element

into REBT (Ellis, 1994). The inclusion of the term ‘behavioural’ was influenced by Corsini (1994), who after recognising the numerous behavioural techniques integrated within REBT encouraged Ellis to include the term within its title. While the theory of REBT was founded from both ancient and modern philosophy, REBT also draws heavily from the epistemology of science to better explain human functioning and disturbance (Ellis, 1994). Ellis purported when obtaining knowledge about the self, others and the world a scientific method and empirical way would be best applied (Digiuseppe et al., 2014). Accordingly, REBT is underpinned by Popper’s (1962) proposition of falsifiability, based upon the premise of acknowledging and attempting to falsify our proposed hypothesis. In sum, the epistemology of science (i.e., empirical, logical, and pragmatic) informs the categorisation of irrational and rational beliefs as well as the framework by which practitioners promote rational beliefs to enhance psychological health.

2.1.2 The ABC(DE) Model. The ABC(DE) model is central to cognitive behavioural therapy and most notably REBT (see Figure 2.1; David, Lynn, & Ellis, 2010). This framework denotes that cognitions, emotions, and behaviours are cognitively penetrable (David, Miclea, & Opre, 2004), Whereby, human responses (e.g., feelings, behaviours) are a product of unconscious or conscious processes, thus changes in cognitions will result in changes in human responses. Cognitive behavioural therapies ascribe varying levels of importance to different levels of cognitions. For example, REBT is centered upon ones irrational and rational beliefs in comparison to methods such as Cognitive Therapy (CT; Beck, 1964) that is focused upon the role of automatic thoughts and schemas (Beck, 1995). In practice REBT practitioners use a situational ABC (DE) model based upon the premise, people experience undesirable activating events (A; or adversity¹), about which they have

¹ Adversity represents a specific activating event representing a thwarting of one’s goals related to failure, rejection, or poor treatment (Ellis, 1994; Ellis & Dryden, 1997).

rational and irrational beliefs (B; David et al., 2005). These beliefs then lead to four intimately interconnected levels of cognitive, emotional, behavioural, and physiological consequences (C). REBT theory posits that IBs about adversity (e.g., failure, rejection and ill-treatment) lead to unhealthy negative emotions (e.g., anxiety, depression, guilt) and dysfunctional behaviours. Whereas RBs about adversity lead to healthy negative emotions (e.g., concern, sadness, remorse) and functional behaviours (Dryden & Branch, 2008). Once generated, these consequences (C) commonly become the activating event (A), producing secondary IBs and meta-emotions (i.e., becoming anxious about being anxious). Ultimately, the ABC (DE) model explains how two individuals can respond, that is think, feel, and behave differently based on what they tell themselves about the situation (Maclaren, Doyle, & Diguseppe, 2016).

Ellis (1994) proposed that humans are both rational (self and socially helping) and irrational (self and socially defeating) beings. RBs are flexible, consistent with reality, logical, functional, and helpful to the individual in pursuing respective goals, by contrast IBs are rigid, inconsistent with reality, illogical, dysfunctional, and hinder goal achievement (W. Dryden & Branch, 2008). To emphasize and support a rational philosophy practitioners use three main strategies to actively dispute (D) the clients IBs and replace them with more adaptive and effective rational alternatives (E). First, a REBT practitioner would encourage the client to seek *empirical* evidence that confirms or disproves the truth of the irrational belief. Second, REBT presents a *logical* argument, questioning whether their irrational belief follows from a rational preference. Finally, REBT proposes whether clients IBs are *pragmatic*, that is, asking whether holding such beliefs have been helpful or a hindrance for them (Dryden & Neenan, 2015). Although, REBT is philosophically underpinned, irrational and rational beliefs are psychologically defined, and therefore must meet at least one criterion

within the disputation phase to be classified as a rational belief. Accordingly, REBT literature has used the terms healthy, functional, and adaptive interchangeably to characterise a response that is facilitative of goal achievement. For example, the terms functional and dysfunctional are used to define the type of cognitions, whereas, adaptive and maladaptive are used in reference to behaviours, and finally the terms healthy and unhealthy are used for emotions and psychophysiological responses (David et al., 2010). Indeed, when disputing an individual's IBs REBT practitioners are not restricted to cognitive techniques of disputation, but also harness emotive (rational emotive imagery; Lipsky, Kassino, & Miller, 1980) and behavioural methods (i.e., in-vivo desensitisation, risk-taking, shame attacking; Ellis, 2003), to comprehensively dispute individuals IBs (Dryden & Neenan, 2015). The breadth and depth of dispositional techniques are fundamental to REBT because one's beliefs are not always consciously accessible, but represented in the implicit rather than the explicit memory system (David, 2003), and therefore cognitive techniques alone would be insufficient to encourage a rational shift. Irrational and rational beliefs are central to REBT theory, where IBs hamper adequate functioning and RBs contribute to positive coping and resilience in the face of adversity (David et al.). In sum, the application of REBT that is the reduction of IBs and promotion of RBs may help performance via the aforementioned effects on emotion and behavioural functionality. Nevertheless, to further understand the effects of beliefs on performance and human functioning it would be prudent to understand their origins and evolutionary role for human survival.

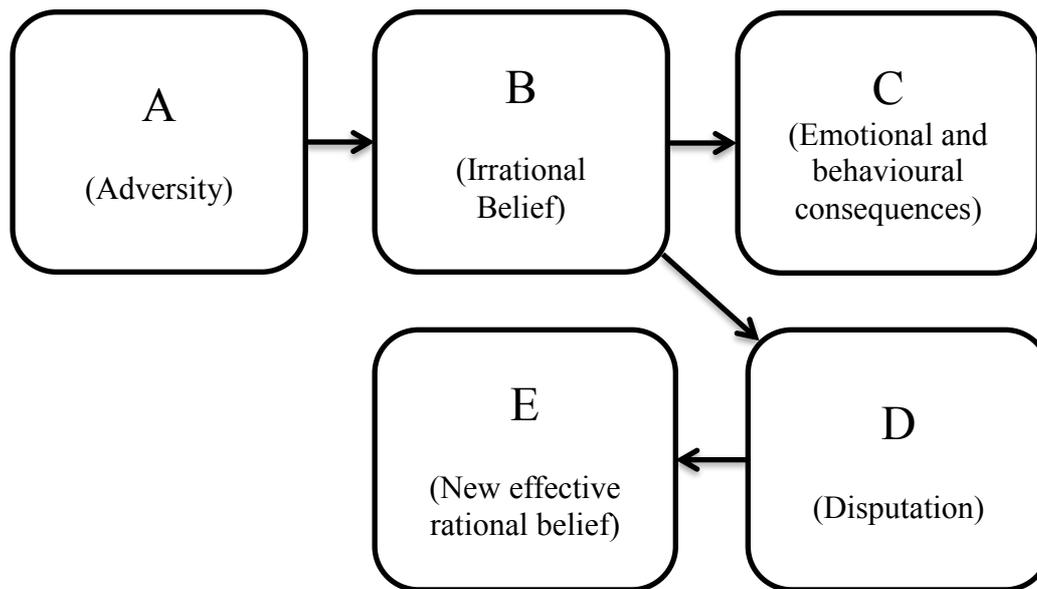


Figure 2.1. A schematic of the ABCDE model used within the REBT process.

2.1.3 Origins of irrational and rational beliefs. To understand and explain the individual differences in beliefs researchers have explored both environmental factors based upon a social science model (e.g., cultural/educational) and evolutionary science, centred upon biological predispositions to understand the determinants of irrational and rational beliefs (David & DiGiuseppe, 2010; Neenan & Dryden, 2004). From an evolutionary perspective irrational and rational beliefs are proposed to have a strong biological basis that appears frequently during its evolutionary history and positively affects human reproduction, hereby harbouring adaptive functions (David & DiGiuseppe, 2010). For example, demandingness, frustration intolerance, and anger would have served an adaptive function when ones mating status was challenged by a rival, resulting in a forceful and drastic response to nullify the challenge. However according to the mismatch theory in today's society such extreme, dogmatic, and rigid beliefs are proposed to be maladaptive, instead leading to emotional (e.g., unhealthy anger, depression, anxiety) and social problems (e.g., social isolation, antisocial behaviour; David & DiGiuseppe, 2010). Although the biological basis of IBs is intuitively appealing, identifying the precise causal determinants is proposed

to be unreasonable, subsequently there is an absence of research supporting the biological basis for irrationality which remains open for debate.

Though limited in empirical support previous researchers have put forth the social science model to better understand and explain the mechanisms and interplay between one's beliefs and their environment (Cosmides & Tooby, 2006). According to this paradigm, the environment (e.g., social, cultural, parental) introduces irrational and rational meaning into one's understanding of themselves and the world. Beliefs are independent of intelligence (David & DiGiuseppe, 2010) and are formed after a variety of subjective, emotional, and psychological experiences in environments created by their cultural background, friends, family, peer's groups, teachers, education, and life experiences, to name a few (Shermer, 2012). Thus, researchers hypothesised those exposed to environments prevalent with IBs and dysfunctional behaviours are likely to develop IBs, likewise with RBs (David & DiGiuseppe, 2010). For example, a study by Barlow and Coren (2004) indicated that children reared in environments rich in IBs (i.e., parents who display high levels of psychopathology and IBs) also reported higher levels of IBs. These experiences are proposed to formulate a system of intricately linked beliefs that largely influences their worldview and one's perception of reality. Once exposed, such beliefs are said to be maintained and reinforced through a number of cognitive biases that distort one's perception across a variety of contexts (Shermer, 2011).

Nevertheless, from a scientific standpoint there exists a false dichotomy between the biological and environmental influences, none more so than on irrational and rational beliefs. Whilst the biological perspective purports irrational and rational beliefs are inherent and harbour adaptive qualities, environmental factors also influence their subsequent development. Thus, phenotypic characteristics, including irrational/rational beliefs of an organism are the joint product of genes and environment. To explain, a common perception

that the brain is a blank canvas merely influenced by the subsequent experiences was repudiated for its simplistic view (Cosmides & Tooby, 2006). Many aspects of human cognition, such as IBs seem to be a universal human trait. Accordingly, the human mind presents a base of regulatory circuits that are functional and domain specific. Thus, both irrational and rational beliefs included within these circuits shape an individuals interpretations of their experiences as frames of meaning, in turn facilitating the understanding of others actions and intentions (Cosmides & Tooby, 2006). Therefore, all humans share certain assumptions about the world and are predisposed to irrational and rational beliefs, moreover the type of belief is not directly predicted by their genes, instead a predisposition implies that both environments and gene interact to assimilate irrational and/or rational beliefs. In sum, an individual's endorsement of irrational/rational beliefs and ability to respond adaptively to adversity is in part a function of the interaction between environmental factors and their genes (David & DiGiuseppe, 2010). Thus, one's beliefs are cognitively penetrable and having important implications for practitioners who are looking to use REBT to dispute and replace IBs with rational alternatives. The term 'belief' is ubiquitous in human language and scientific theories (i.e., self-efficacy, religious). Accordingly in-line with REBT theory researchers have established what defines and distinguishes an irrational and rational belief; indeed having important theoretical and applied ramifications.

2.1.4 Distinctions in irrational and rational beliefs. As defined within REBT beliefs are concepts that we hold to be true (David et al., 2010), acting as a filter between the world we encounter and our subsequent actions. These beliefs are proposed to exist as cognitive processes and cover various areas of content (i.e., performance, comfort, achievement, control, affiliation) whilst referring to the self, others, and life conditions (Szentagotai & Jones, 2010). These beliefs are distinguished into irrational and rational

beliefs. The term irrational is characterised as unhelpful, illogical, and inconsistent with the social reality, whereas the term rational is characterised as helpful, logical, and consistent with social reality (Dryden & Branch, 2008). After initially proposing 11 irrational belief types (Ellis, 1962), subsequent developments within REBT suggest irrational and rational beliefs fall into four main categories. The four-core irrational and rational beliefs each comprise of one primary and three secondary beliefs. The primary core irrational belief is a 'demand' and refers to absolutistic "musts", "should" and "oughts". Following this are three secondary IBs of: 'awfulizing' referring to an individual's belief that the situation is worse than it could be, 'frustration intolerance' refers to individual's belief that they will not be able to endure situations or have any happiness, and 'global evaluation and self/other/life-downing' which appears when individuals overgeneralize and become overly critical of themselves or others (DiGiuseppe et al., 2014; Montgomery, David, DiLorenzo, & Schnur, 2007). According to REBT theory in the face of adversity, IBs leads to dysfunctional and unhealthy negative emotions (e.g., anger, anxiety, depression) that are associated with maladaptive behaviours (e.g., avoidant and/or escape based behaviours; Dryden & Branch, 2008). In contrast, the primary rational belief is a 'flexible and a non-extreme preference' stressing desires instead of demands. Followed by three secondary beliefs of: 'anti-awfulizing' that presents a realistic evaluation of badness, 'frustration tolerance' referring to an individual's belief that they can tolerate discomfort, and finally unconditional self/other/life acceptance that emphasises that no person can be evaluated on a single global rating (DiGiuseppe et al.). Unconditional self/other/life –acceptance is a key tenet of REBT and a condition that fosters psychological well-being (Ellis, 1962). Unconditional Self-Acceptance (USA) is explained as "an individual fully accepting himself whether he behaves intelligently, correctly, or competently and whether or not other people approve, respect or love him" (Ellis, 1977, pg 101). As such clients engaged in REBT process are encouraged to

accept that they, others, and life are fallible and too complicated to be globally evaluated as completely bad or stupid. Instead, being taught people are valuable in themselves even when they behave unfavourably (Szentagotai & Jones, 2010), helping unconditional acceptance of themselves/others/life when they fall short of their own or others expectations, therefore rating actions and behaviour over the person. Given the centrality and dichotomous (healthy vs. unhealthy) effects of irrational and rational beliefs on emotion, significant attention has been given to examine its effects and efficacy on psychological health.

2.1.5 Empirical support for REBT. Since the introduction of REBT there has been a plethora of studies that have made critical contributions (Bond & Dryden, 2000) towards REBT theory. Furthermore, its effect and efficacy as an intervention to develop psychological health has been well supported within the literature (Browne, Dowd, & Freeman, 2010; David et al., 2005). REBT has received support from over 100 published empirical evaluations (Si & Lee, 2008) and three meta-analyses regarding the application of REBT on psychological disturbance. In a meta-analysis of 70 studies, the effects of Rational Emotive Therapy (RET) were compared to baseline, control groups, cognitive behaviour modification, behaviour therapies, or other psychotherapies (Lyons & Woods, 1991), reporting an effect size of 0.95. Although the findings showed REBT to be an effective form of therapy, conclusions were moderated due to methodological flaws and an absence of follow-up data. In development, a meta-analysis of 28 controlled studies reported RET to be superior to placebo and no treatment, as well equally effective in comparison to other therapies (e.g., systematic desensitization). Specifically reporting an effect size of 1.62, the meta-analysis results showed increases in rational thinking were matched with improvements in participants subjective wellbeing and behavioural outcomes that improved during follow-up periods (Engles, Garnefski, & Diekstra, 1993). This suggested when applying REBT there may exist a delayed effect, a consequence of disputing and replacing ones engrained and

deep-rooted beliefs. Although supporting the efficacy of REBT as an intervention that enhances psychological health, the findings were restricted to an adult population. A subsequent meta-analysis by Gonzalez et al. (2004) reviewed the impact of REBT on treatment outcomes in children and adolescent populations, reporting effect-sizes of .50. The study also reported various noteworthy findings having implications for applied practice. First, in contrast to previous meta-analyses REBT was reported to be more effective than alternative treatments (e.g., human relations education, self-concept, and enhancement training). Second, REBT was equally effective for both children and adolescents with and without presenting issues. Thus, highlighting REBT may offer a pro-active intervention that develops psychological health rather than simply a problem-focussed intervention. Finally, the intervention effects were positively associated with longer session duration (Gonzalez et al., 2004), suggesting a dose effect when applying REBT.

In sum, REBT is originally a psychotherapeutic intervention that treats clinical cases that present with symptoms of mental illness. Nonetheless, research has evidenced the positive effects of REBT as an intervention in clinical, sub-clinical, and non-clinical groups, as well as across a broad spectrum of age ranges (9-70) for both males and females (David et al., 2005). Therefore, not restricted to clinical contexts the aforementioned findings support the applicability and versatility of REBT as an intervention to enhance human functioning beyond clinical settings. To further understand the effects and mechanisms by which REBT may enhance human functioning, researchers have examined the association between irrational and/or rational beliefs on emotional consequences.

2.1.6 Irrational beliefs and emotions. Research investigating the association between beliefs (B) and consequences (C) has received much attention, most notably in relation to emotional consequences (David et al., 2010). IBs have been consistently associated with emotional disorders within both clinical and non-clinical populations

(Bernard, 1998; David, Freeman, & DiGiuseppe, 2010a). For example research has reported IBs to be associated with trait anxiety, trait anger, trait depression (e.g., Bernard, 1998), speech anxiety, test anxiety (e.g., Goldfried & Sobocinski, 1975), major depressive disorders (Macavei, 2005), and guilt (David, Schnur, & Belloiu, 2002). More recently, the association between IBs and emotional distress (e.g., anxiety, depressive symptoms) has been verified in both clinical and non-clinical settings (David et al., 2005; Montgomery et al., 2007; Szentagotai et al., 2008). Further, supporting the applicability and effects of REBT as an intervention within non-clinical populations (i.e., performance contexts). Whilst, the efficacy and effect of REBT had been established, few studies have systematically evaluated the research associating IBs and psychological distress until a recent meta-analysis by Višlā, Flückiger, Holtforth and David (2016). Based upon 100 different samples, from 83 studies, and across 13 different countries Višlā et al. (2016) reported a moderate positive association between IBs and general distress ($r = .36$), depression ($r = .33$), anxiety ($r = .41$), anger ($r = .25$), and guilt ($r = .29$; Visla, Fluckiger, Holtforth, & David, 2016). Furthermore, the strength of relationship between IBs and different emotional disturbances (e.g., anger, anxiety, guilt) were moderated by age, education, and clinical status. In sum, there exists a plethora of literature that has associated IBs with unhealthy negative emotions. Although the type of negative emotion experienced is in part a function of the adversity one encounters, researchers have evidenced the interplay of irrational/rational beliefs to be associated and predictive of differing emotions.

2.1.7 Irrational beliefs as predictors of emotion. Although many theorists suggest anxiety includes several affective elements such as, guilt, fear, shame, anger, excitement (Gray, 1979; Izard, 1972), research and clinical accounts in REBT describe the interplay of IBs as predictors of specific emotional problems (David, 2003). That is, IBs are characterised by four core beliefs of demand, awfulizing, frustration intolerance and self-downing/global

evaluation, some or all of which interact to determine unhealthy negative emotions (i.e., anxiety, depression, unhealthy anger, guilt, shame, hurt, unhealthy jealousy, & unhealthy envy; Dryden & Branch, 2008). To illustrate, the IBs of demand and awfulizing have been associated with symptoms of anxiety, whereas depressive symptoms have been associated with demand and global evaluation/self-downing (David, 2003). Symptoms of anger have been related to demand, frustration intolerance, self-downing/global evaluation. In addition, the unhealthy emotion of guilt has been associated with demand (moral/personal code of conduct) and self-downing/global evaluation. When encountering adverse events, IBs are hypothesised to lead to unhealthy negative emotions (i.e., concern, sadness, healthy anger, remorse, disappointment, sorrow, healthy jealousy, healthy envy). Researchers have evidenced the association between IBs and psychological distress, as well elucidating the interplay between ones beliefs and negative emotions. However, relatively less is understood about the mechanisms by which irrational and rational beliefs may lead to unhealthy negative emotions when encountering adversity. Subsequently, researchers have offered various theoretical explanations into the association between irrational and/rational beliefs and emotion formation. Indeed, greater understanding into such mechanisms may help explain the effects of beliefs on alternative consequences (i.e., behaviour, cognitive, physiological) and actual performance.

2.2 REBT Theory and Emotion

2.2.1. Cold versus hot cognitions. In an attempt to understand the influence and mechanisms between cognitions and healthy and unhealthy emotions, early researchers proposed the two-factor theory of emotions (Schachter & Singer, 1962). The two-factor theory explained that emotion was a result of physiological and most importantly cognitive

representations; the latter being central to emotion formation and was made up of schemas, inferences, attributions, and automatic thoughts. Such representational cognitions were likened to what Abelson and Rosenberg (1958) termed as a “cold cognition”. Although previous researchers suggested “cold cognitions” were closely related to emotions (e.g., Weiner, 1985), contemporary theorists (Lazarus, 1991) posit that “cold cognitions” alone would not be sufficient for the formation of emotions. To explain, researchers instead proposed the role of “hot cognitions” as the primal and proximal cognitive cause of emotional development (Hyland & Boduszek, 2012). Likened to a cognitive appraisal or an evaluative cognition the effects of “cold cognitions” are mediated by “hot cognitions” in reference to themselves and personal well-being (Ellis, David, & Lynn, 2010). Congruent with REBT theory “cold cognitions” are comparable to how individuals represent the activating event (A) in their mind, whereas “hot cognitions” represent ones evaluation (B) of the “cold cognitions”(A). In REBT the central role of ones core beliefs in determining an individual’s emotional response. Thus, instead of treating a symptom in isolation the process of REBT changes beliefs (“hot cognition”) that promotes a rational philosophy to life, treating a wider range of emotional disorders (i.e., hurt, anger, depression, anxiety, envy, shame; Trower & Jones, 2001). In sum, research on hot cognitions partly explains how beliefs influence emotion formation, as well alluding to the notion that hot cognitions are consciously accessible (David et al., 2005). Nevertheless, in an attempt to form a comprehensive understanding of emotion formation, researchers offered the cognitive theory of emotion formation (Ellis, 1994) to help explain how beliefs may also be processed unconsciously (David, Schnur, & Belloiu, 2002).

2.2.2. Ellis’ cognitive theory of emotion. REBT theory of emotion formation is based on the premise that ones beliefs can be consciously and unconsciously processed (David et al., 2005); further, hypothesising that emotions which lead from IBs are qualitatively

different from those mediated by RBs (David et al., 2005; Ellis, 1994). It would be prudent to note that the qualitative conception of emotion as proposed within REBT is distinct to directional interpretations of anxiety symptoms as proposed by Jones, Swain and Hardy (1993). Thus, not being the intensity or the perception but the quality that distinguishes the functionality of an emotion (i.e., sadness vs. depressions; concern vs. depression; Dryden & Branch, 2008). Accordingly, Ellis's cognitive theory states both IBs and RBs mediate the formation and functionality of the resulting emotions (David & Szentagotai, 2006). Specifically, IBs lead to unhelpful negative emotions and maladaptive behaviour, whereas RBs lead to helpful negative emotions (David et al., 2005). This binary vs unitary distinction of emotion has received much attention within the REBT literature. Ellis (1962) initially proposed emotions were assessed upon its intensity, thus presenting a unitary model of distress. Subsequently, Cramer and colleagues conducted a series of studies to elucidate the quantitative versus qualitative distinction in emotion (e.g., Cramer, 2004, 2005; Cramer & Fong, 1991). Supporting Ellis' original hypothesis (unitary model of emotion) the results showed IBs were positively correlated with both functional and dysfunctional negative feelings. In addition, Wessler (1996) put forth that no other major theory of emotion acknowledged binary model of distress and therefore repudiate claims of a binary model of distress.

On the contrary, and more recently researchers have rebutted such claims, highlighting both theoretical and methodological limitations of the aforementioned studies (e.g., David et al., 2002). First, the aforementioned studies failed to consider that IBs are held implicitly and only activated during real-life stressful scenarios, instead using imagined situations as part of their methodologies (Ellis, 1994; Szentagotai et al., 2008). Second, from a theoretical perspective, a positive correlation between IBs and both depression (unhealthy negative emotion) and sadness (healthy negative emotion) would not discount the binary model;

instead, it could be claimed that those with unhealthy emotions will also experience healthy emotions at the same time (i.e., depression and sadness; David & Cramer, 2010).

Nonetheless, more recently David and colleagues reported positive correlations between IBs and dysfunctional feelings (e.g., David et al., 2002; David, Schnur, & Birk, 2004; David et al., 2005), as well, showing IBs were related to concern (healthy negative emotion), whilst RBs were associated with anxiety (unhealthy negative emotion; Harris, Davies, & Dryden, 2006). In addition, from a theoretical standpoint the binary model of distress is indirectly supported by Schacter and Singer's (1962) two-factor theory, proposing that cognition and the same arousal response can lead to different emotional states (i.e., anger vs. excitement; David & Szentagotai, 2006).

The binary model of distress presents a significant theory of emotion formation, putting forward the claim that not all negative emotions experienced require intervention, instead emphasising the notion that negative emotions can be helpful for an individual to reach their respective goals. For example, if one were to approach an exam with feelings of concern (healthy negative emotion), this could feasibly lead to adaptive behaviours such as greater preparation and increased effort towards revision; on the contrary if one approached an exam with anxiety (unhealthy negative emotion), this may lead to concentration disruptions (e.g., worrying over the outcome) and avoidant behaviours. Recent reviews of the binary vs unitary model of distress favor the binary model of distress due to its support across various cognitive paradigms (David & Cramer, 2010; Hyland & Boduszek, 2012).

In sum, REBT can be explained by two different approaches in the conceptualisation of emotional disturbances (i.e., unitary vs. binary). Furthermore, a binary model of emotion should not be confused with directional (e.g., facilitative vs. debilitating anxiety) interpretations of emotion (i.e., anxiety; Jones et al., 1993). Instead, according to the binary model emphasis is placed upon qualitative distinction in emotional functionality when

encountering adversity. Although, contemporary research favours the binary view of emotion formation, more empirical research is warranted before drawing conclusions regarding the validity of one approach over the other. Furthermore, to offer greater insight into the association between irrational/rational beliefs and emotion formation and human functioning researchers have also referred to the appraisal theory of emotion (Lazarus, 1991).

2.2.3. REBT and cognitive appraisal paradigm. REBT has provided one of the most significant psychological treatments developed during the 20th century. Although the efficacy and effect of REBT could be seen to support Ellis's cognitive theory of emotions, it remains less visible in the mainstream emotion research due to the lack of experimental research examining the assumptions of REBT on emotion formation (David, Ghinea, Macavei, & Kallay, 2005). Consequently, there is an emerging body of research beginning to elucidate the organisation and interrelations between one's beliefs, distress and ensuing consequences using the Cognitive Appraisal Theory (CAT; Lazarus, 1991; e.g., David, 2003; David, Schnur, & Belloiu, 2002; David, et al., 2005). To develop and improve the explanatory value of Ellis's cognitive theory of emotion formation researchers likened REBT to the Cognitive Appraisal Theory (CAT; Lazarus, 1991), furthermore, the CAT provides a framework that would help examine the binary model of emotions (Hyland & Boduszek, 2012). The CAT is argued to be the most prominent and extensively studied theory of emotion formation in contemporary literature (Lazarus, 1991; Lazarus & Folkman, 1984), and the concept of appraisal is widely used as an approach to stress and emotion (Lazarus, 1991). Ziegler (2001) first suggested that CAT and REBT theory shared many salient concepts, none more central than the concept of cognitive appraisal, which although implicit, forms a large part of the ABC model (Ellis, 1994). To explain, an appraisal is an evaluative cognition that intervenes between the encounter and the reaction (Ziegler, 2001). Essentially, Ziegler (2001) proposed that a person's beliefs and appraisals are both evaluative concepts

that are proximal antecedents of emotion. To illustrate this point, David and Szentagotai (2006) provided a comprehensive amalgamation of both REBT and appraisal theory further illuminating the mechanisms of change underpinning emotion formation (see Table 2.1).

Table 2.1

A hypothesised model of emotion formation based on both REBT theory and appraisal theory (David & Szentagotai, 2006)

Appraisal Theory (Smith et al., 1993) REBT			REBT Theory in the Appraisal Theory's Terms; An hypothesised model Core		
Emotion	Core relational theme	Appraisal Components	Emotion: Dysfunctional and Functional	Core relational theme	Important appraisal components
Anger	Other-blame	Motivationally relevant Motivationally incongruent Other - accountability (e.g., the others life conditions)	Anger	Other-blame	Motivationally relevant. Motivationally incongruent with DEM. Other – accountability (i.e., the others life, conditions).
			Annoyance		Motivationally relevant. Motivationally incongruent with preferences. Other – accountability (i.e., the others life, conditions).
Guilt	Self-blame	Motivationally relevant Motivationally incongruent Self - accountability (e.g., myself)	Guilt	Self-blame	Motivationally relevant. Motivationally incongruent with DEM. Other – accountability (i.e., myself).
			Remorse		Motivationally relevant. Motivationally incongruent with preferences. Self – accountability (i.e., myself).
Fear - Anxiety	Danger-threat	Motivationally relevant Motivationally incongruent	Fear-Anxiety	Danger-threat	Motivationally relevant. Motivationally incongruent with DEM. Low of uncertain

		Low or uncertain emotion-focussed potential			emotional-focussed potential (i.e., AWF, FI).
			Concern		Motivationally relevant. Motivationally incongruent with preferences. Low of uncertain emotional-focussed potential (i.e., non AWF, FT).
Sadness	Irrevocable loss; Helplessness about loss.	Motivationally relevant. Motivationally incongruent. Low problem focused potential. Negative future expectations.	Depression	Irrevocable loss; Helplessness about harm or loss.	Motivationally relevant. Motivationally incongruent with DEM. Low problem-focussed potential (i.e., SD). Negative future expectations.
			Sadness		Motivationally relevant. Motivationally incongruent with preferences. Problem-focussed coping potential (i.e., non-SD). Positive future expectations.

Appraisal components are separated into primary-, secondary-, and re-appraisals. Motivational relevance and motivational congruence make up a primary appraisal, and while motivational relevance involves evaluating the relevance of the situation to a persons goals, motivational congruence evaluates the extent to which the situation is congruent to a persons goals (Smith, Haynes, Lazarus, & Pope, 1993). Essentially this appraisal depicts a person's representation of the environment and their goals. It is here through the appraisal process that a person evaluates a set of circumstances in reference to their well-being (Lazarus & Folkman, 1984). Comparably, REBT theory postulates

that events are appraised in terms of the extent to which they hinder or facilitate goal achievement. Therefore, when encountering a challenging situation that is motivationally relevant and low in motivational congruence the person's primary core belief of demand (irrational) or preference (rational) will mediate the functionality of the resulting negative emotion (David, 2003; David & Szentagotai, 2006).

Secondary appraisals are made up of four components related to both their resources and options for coping within a threatening situation (Smith et al., 1993). These include: accountability, problem-focussed coping potential, emotion-focussed coping potential and future expectancy. Previous researchers suggest that the irrational belief of self-downing mediates the association between low problem-focussed potential and dysfunctional emotions during adverse situations (David, 2003; David et al., 2002). Similarly, both high levels of awfulizing and frustration intolerance beliefs were proposed to mediate the association between low emotion-focussed coping and dysfunctional emotions during negative situations. An individual's self-downing is thought to mediate a person's future expectancies and dysfunctional emotions, whereas, accountability appears to refer to the relation between IBs and either the self (i.e., self-accountability), others/life conditions (other/life-accountability; David & Szentagotai, 2006). Accordingly, research supports the association between both: primary core beliefs (i.e., demand and preferences) and primary appraisals and secondary core beliefs (i.e., awfulizing/non-awfulizing, frustration intolerance/frustration tolerance, & self/other/life: downing/acceptance) with secondary appraisals (David et al., 2002; David & Szentagotai, 2006). The findings from David et al. (2002) further supports the binary model of emotions for three reasons. First, appraisals were associated with both dysfunctional and functional emotions. Second, IBs were associated with dysfunctional emotions (e.g., anxiety, depression, guilt anger and finally) and finally, RBs were

associated with functional emotions (e.g., concern, sadness, annoyance, regret). These findings support the central premise of the ABC model within REBT theory that is, a person's beliefs (B) or appraisal delineates the personal significance of any situation and thus is proximal to the formation of emotion. Thus, although the situation (adversity) will contribute, a person's appraisal (beliefs) will directly determine the resulting emotion. As proposed in CT and 2nd wave therapies, thoughts do not operate in a vacuum (i.e., cognitions) and alone present an inadequate theory of mind, behaviour and emotion (Lazarus, 1991). Similarly to ABC(DE) model the appraisal theory purports that the interaction between ones cognitions, emotions, goals, beliefs, and coping options informs the ability to manage the person environment relationship. Indeed, Lazarus (1999, pp. 87-88) articulates the resemblances and central role of both beliefs and cognitive appraisals as a determinant of emotion, whilst alluding to the functionality of a person's response:

“...because we have appraised events in a particular way, most often based on unwise or inaccurate assumptions, motives, and beliefs. Much of the time, these assumptions results in emotions that are inappropriate to the realities of the situation we are facing” (Lazarus, 1999, p88).

In sum, the incorporation of the cognitive appraisal paradigm with REBT theory, although complex provides a model that may further explain and predict the specific and sequential effects of beliefs on emotions (David et al., 2005). Nevertheless, when operating in domains such as elite sport, successful performance is in part a function of an individual's ability to deal with the inherent dynamic and demanding nature of competition. Hence the CAT may also explain the transactional nature of ones IBs and RBs, that is, the moment-to-moment fluctuations in emotion (healthy vs. unhealthy) when encountering adversity (Lazarus, 1989).

To illustrate, Lazarus and Folkman's (1984) transactional model underlines the importance of re-appraisals, proposing that both stress and coping are involved in an ongoing dynamic process, in turn transacting with the environment (Hanton, Fletcher, & Coughlan, 2005). A person's re-appraisal refers to a modified appraisal based upon new information from the environment or the person (David & Szentagotai, 2006). Therefore, when a person experiences a stressful situation (A), the generated consequences (C) derived from the beliefs (B) then become the secondary activating event (A) producing secondary beliefs (B) and meta-emotions (C; i.e., a person can become anxious about being anxious). Subsequently, a secondary belief acts as a re-appraisal, preventing the formation of secondary emotional disturbances and managing a person's self-criticism (Szentagotai et al., 2008). This is asserted to be a distinct component of REBT, increasing its efficacy in comparison to alternative cognitive behavioural therapies. Although such conclusions are by no means unequivocal and remain to be challenged, empirical research would suggest that both Ellis' cognitive theory of emotion and CAT are intimately related and theoretically compatible. The literature alludes to theoretical overlap and similarities between REBT theory and CAT to understand emotion formation and the mechanisms by which one's beliefs determine functional and dysfunctional consequences to adversity (e.g., behaviours, physiological, cognitive). Not restricted to emotion formation, researchers have put forth REBT as an adaptable model of optimal human functioning, and as a result various concepts have penetrated into broader domains such as: cognitive psychology, psychology of stress, coping, and resilience literature (Ellis et al., 2010; David et al., 2010). In turn, providing a framework that is both applicable and appropriate across a broad range of settings (David et al., 2010). Despite this, the effects of REBT, and irrational and rational beliefs on performance have been overlooked within the literature. In addition, research

investigating the relationships and effects of IBs/RBs on cognitive, behavioural, and physiological consequences has received relatively less attention and requires further investigation in comparison to emotions (David et al., 2005). Greater understanding into these areas would advance and help to elucidate the precise effects of irrational and rational beliefs on human's ability to function and ultimately perform.

2.3 REBT Across Performance Contexts

2.3.1 Irrational beliefs and behavioural consequences. The theory of REBT is based on the premise that in response to adversity beliefs determine the functionality of the emotion (healthy/unhealthy) and behaviour (adaptive/maladaptive; Szentagotai & Jones, 2010). IBs are proposed to generate unhealthy negative emotions and in turn facilitate tendencies to use avoidant and self-defeating behaviours. Instead RBs lead to healthy negative emotions and engage in approach behaviours (Ellis, 1994). In contrast to emotion formation, there is an absence of empirical research investigating the effect of REBT and the associations between IBs/RBs and behaviour (dysfunctional/functional; David et al., 2005). This scarcity can be explained by first, the late introduction of the behavioural facet of Rational Emotive Therapy (RET) and second, the inherent methodological difficulties in ascertaining the causal effects of beliefs on behaviour itself (Szentagotai & Jones, 2010). For example, in clinical settings dysfunctional behaviours (e.g., disordered eating, social avoidance, & anger expression) are difficult to quantify. In addition, due to the complexity of mental illness there may exist confounding extraneous variables that cannot be controlled and threaten the internal validity of the study findings.

Nonetheless, from the limited research tentative associations have been evidenced between four core IBs and various behaviours categorised as maladaptive. First, the central irrational belief of 'demand' has been associated with behaviours such as: increased anger expression (Watson, Sherbak, & Morris, 1998), decreased performance in social context,

(Silverman & DiGiuseppe, 2001), self-harming (Harrington, 2005), and behavioural avoidance (Bridges & Roig, 1997). The irrational belief of ‘awfulizing’ has been associated with behaviours such as: submissive interpersonal style (Goldberg, 1990), increased expression and suppression (Silverman & DiGiuseppe, 2001). The irrational belief of ‘frustration intolerance’ has been associated with behaviours such as: decreased anger control (Watson, Sherbak, & Morris, 1998), social isolation, procrastination, and marital problems (Jones & Trower, 2004). Finally, the irrational belief of ‘global evaluation/self-downing’ has been associated with behaviours such as: defensiveness to negative feedback (Chamberlain & Haaga, 2001) and increased anger suppression and expression (Jones & Trower, 2004). The findings broadly support the association between IBs and a variety of self-defeating behaviours (Szentagotai & Jones, 2010). Therefore, in-line with REBT theory and previous research it could be suggested IBs will determine maladaptive behaviours indicative of reduced performance, whereas RBs will determine adaptive behaviours indicative of superior human functioning and enhanced performance. Nonetheless, there is a dearth of research examining the causal influences of irrational and/or rational beliefs on behavioural performance and ultimately goal achievement and warrants a more rigorous and systematic investigation.

The ABC (DE) model central to REBT helps to understand the aetiology of mental disorders and human functioning across a broad range of settings (Ellis et al., 2010). REBT was originally developed as a therapeutic approach in the field of clinical psychology, yet its directive and pragmatic nature makes it an effective approach across various spheres (Criddle, 2007). Robin (1993) first advocated the use of REBT with performers (i.e., actors, artists) to help manage performance anxiety. Specifically, it was suggested that IBs in reference the familiarity, task difficulty, level of stress, expectations to cope, and one’s self-worth were at the core of performance anxiety. For example performers may believe: “ I

must perform perfectly” and “I must not experience any discomfort in performance”. In reference to frustration intolerance one may believe: “I can’t stand the hassle of possibly being rejected” and “I can’t stand the physical discomfort I experience when performing”. For awfulizing suggested performers may engage in “It’s the end of the world if I don’t do well”, whereas for the evaluation of global rating: “I am totally worthless when I believe I have done poorly and not achieved my personal best”. Robin (1993) further supported the value of REBT as an effective technique to deal with the root cause of performance anxiety rather than techniques such as muscle relaxation that managed the physiological symptoms of performance anxiety. Whilst REBT promotes psychological health, it may offer a model of functioning that allows performers to make decisions and effectively respond when faced with an adversity (i.e., under stress) in a manner that is helpful for goal achievement. Greater understanding into the effects of REBT, more specifically the effects of IBs and RBs has implications for not only those operating in highly demanding performance environments (e.g., aviation, sport, military, emergency services) but also for those subjected to everyday stressors (e.g., business; Driskell & Salas, 2013). Ultimately, not restricted to mental health REBT appears to offer a valuable framework for human functioning and adaptively responding to adversity across any applied setting that requires the understanding, description, and prediction of human activity. Although relatively sparse, there is an emerging line of research that is beginning to examine the effects of REBT, and irrational and rational beliefs across a variety of performance contexts.

2.3.2 REBT and academic achievement. To date, educational settings have received the most attention within the literature, examining the application of the ABC(DE) model and the effects of IBs on important psychological outcomes and academic achievement. Previous researchers have estimated that approximately 10% of children and adolescents experience emotional and behavioural issues serious enough to

necessitate professional help (Banks & Zionts, 2009). Often, these issues affect both the student and other student success in school. Accordingly, findings from several experimental studies report that Rational Emotive Education (REE), a derivative of REBT provides an effective intervention to increase academic achievement. Indeed, Bank and Zionts (2009) articulate the distinction in functionality between irrational and rational beliefs, amid thinking that leads to, versus thinking that interferes with goal attainment. Specifically, in-line with REBT theory IBs lead to unhealthy negative emotions (e.g., anxiety, excessive anxiety, guilt, & anger) which are characterised by maladaptive behaviours (e.g., aggression, withdrawal and reduced academic and emotional resilience) that by their very nature hinder academic success. On the contrary RBs lead to healthy negative emotions and adaptive behaviours that facilitate academic success. Thus, the main aim of REE is to dispute IBs and replace them with rational alternatives, or reaffirm existing RBs within students. A recent study by Balkis (2013) using 290 undergraduate students reported that RBs were positively related to academic life satisfaction and academic life achievement, whereas IBs were negatively correlated to academic procrastination. Research also shows that academic achievement is negatively related to irrational thinking (e.g., Motaedin & Ebdi, 2007), where specific IBs are associated with academic failure for students (Sapp, 1966). As well, a global endorsement of IBs has also been negatively correlated with academic performance (Eppler & Harju, 1997) and low perception of control (Thompson, Sobolew-Shubin, Galbraith, Shwankovsky, & Cruzen, 1993). Not restricted to examining the associations between irrational and rational beliefs with academic achievement, research has also supported the effects of interventions adopting REBT principles across a variety of psychological outcomes and performance within children and adolescence. For example, REBT has been successful in reducing frustration

tolerance and improving academic performance (Shannon & Allen, 1998), improving self-concept and coping capabilities (Morris, 1993), reducing anxiety (Rosenbaum, McNurry, & Campbell, 1991), reducing depression (Wilde, 1994) and improving social skills (Flanagan, Povall, Dellino, & Byrne, 1998). In addition, a study using 105 undergraduate university students reported IBs predicted exam-related distress (Montgomery et al., 2007). Not restricted to academic settings researchers have also examined the effects of REBT within business and organisational settings.

2.3.3 REBT and business settings. In contrast to educational settings the domain of business presents a contrasting culture focussed upon winning, beating competitors, increasing productivity, and increasing profits (Criddle, 2007). To meet these demands companies support their employees to be both efficient and effective within their role to enhance their productivity. Business settings are often unpredictable and dynamic, where changes in economical climates have ramifications for the job security of its employees (Turner & Barker, 2014b). The prospect, experience, or survival of job redundancy is associated with both psychological and physical ailments (e.g., stress relatedness). Specifically, job loss has been associated with, anxiety, aggression, passivity, and depression (Leana & Feldman, 1988), whereas job insecurity has been associated with lower job satisfaction, increased self-reported physical and psychological distress (Dekker & Schaufeli, 1995). Those who outlast redundancy are exposed to mental health risks due to increased uncertainty, increased workloads, and negative feelings towards co-workers, as well as feelings of guilt, anxiety, stress, and depression. As a result, workers reported reduced productivity, commitment to the organisation and a lack of motivation (Worrall, Cooper, & Campbell, 2000). Considering its applicability there is a scarcity of research applying REBT in business settings to re-actively and/or pro-actively manage mental health issues and performance

of its employees. Amongst the literature, Turner and Barker (2014b) examined the effects of an intensive REBT programme on IBs in staff members undergoing redundancy within a blue-chip organisation. Using a single-group repeated measures design, participants reported reductions in total IBs, other-downing, need for achievement, and a demand for fairness. In addition, social validation data indicated perceived psychological and performance benefits as a result. Although promising, due to the contextual constraints the study included a low sample size and no control-group. In sum, the effects of REBT in business settings are scant, but promising due to difficulties in directly attributing performance outcomes to employee actions no studies document the effects of REBT on subjective or objective indicators of behaviour or performance. One domain that is receiving increasing interest within the literature is that of elite sport.

2.4 REBT and Elite Sport

2.4.1. Demands of elite sport. The way in which athletes feel, think, and behave impacts upon their athletic performance, providing a medium to examine the psychology of human behaviour (Turner, 2016). Beyond the fame, glory, and prestige lies a dark underside to elite sport, characterised by overtraining, over exposure, burnout, and inherent with both professional and personal scrutiny. Questions are asked as to why some athletes are able to manage, even thrive whilst others suffer with severe impairments to their health (e.g., depression, burnout) and performance (Rumbold, Fletcher, & Daniels, 2012). The process of REBT encourages individuals to respond to adversity in a functional and adaptive manner facilitating goal achievement (Dryden & Branch, 2008). Here, elite sport can be highly challenging, offers clear performance outcomes, furthermore, the demands and stressors of elite sport are comparable to the Adversity (A) proposed in the ABC (DE) model. More broadly, competition presents a useful setting in which to explore how performance is

developed, maintained, or disrupted in individuals during a motivated performance situation (Salvador, 2005). To better ascertain the effects of REBT on human behaviour and performance, the domains of elite sport (Part I) and other competitive settings (Part II) offers a rich and dynamic laboratory in which to do so (Moran, 2009).

To perform successfully in sport competition it is vital that elite sport performers have the ability to cope with the demanding stressors placed upon them (Haney & Long, 1995; Holt & Dunn, 2004). Accordingly, with such varied demands placed on athletes it is not surprising that there is an extensive body of evidence identifying the demands (i.e. stressors) performers' experience (Mellalieu, Neil, Hanton & Fletcher, 2009). Most recently research has proposed that stressors can originate from three main sources; competitive, organisational, and personal (e.g., Hanton et al., 2005; McKay et al., 2008; Weston et al., 2009). Whilst offering a comprehensive assessment into the stressors, there exists, however, a dearth of research with elite athletes with a disability. This is surprising considering there has been a rapid growth in the representation of athletes with a disability at major competitions (Arnold, Wagstaff, Steadman, & Pratt, 2016). To illustrate, the Paralympics is the second largest multisport event in the world (Legg & Steadward, 2011), where competitors have increased from 400 (1960) to 4250 (2012). Whilst emerging (e.g., Blumenstien & Orbach, 2015; Arnold et al., 2016) there is a paucity of research that has examined the issues and effects of interventions with specific populations, such as athletes with a disability (Barker, Mellalieu, McCarthy, Jones, & Moran, 2013). From the scant literature, research has focussed on the participation of athletes with a disability in sport (Jaarsma et al., 2014), used case-based approaches (e.g., Bawden, 2005), or explore the demands of athletes with a disability (e.g., Arnold et al., 2016). However, few have put forth an applied and rigorous examination into the effects of an intervention on athletic performance. Accordingly, the use of single-case research designs have been offered as an

empirical and rigorous methodology by which to examine the issues and effectiveness of interventions with elite athletes with a disability (Barker et al., 2013).

In sum, much less is understood about the effects of psychological interventions on elite athletes with a disability. Furthermore, there is increasing demand to provide support for those operating in Paralympic sport. Whilst researchers proposed there are more similarities than differences (Arnold et al., 2016; Dieffenbach & Statler, 2012), there are intricacies and considerations to be made when working with elite athletes with a disability (i.e., compromised self-identity, diminished self-worth, body image issues, and depression; Skordilis, Skafida, Chrysagis, & Nikitaras, 2006), accordingly, requiring further examination using more rigorous applied methodologies (e.g., single-case research designs). Furthermore, researchers have put forth REBT as a potentially efficacious intervention to be applied with individuals with a disability (Ellis, 1997). Specifically, researchers suggested the process of REBT may promote self-acceptance, overcome frustration intolerance, and self-downing. However, no research to date has empirically examined these postulations. Not restricted to individual characteristics of athletes, researchers have proposed the reciprocal nature of IBs and the context of elite sport, having ramifications on psychological health, as well as performance.

2.4.2. The context of elite sport and irrational beliefs. Elite sport is a unique environment and the challenges athletes encounter are not typically experienced by members of the general population (Lebrun & Collins, 2017). The breadth of stressors athletes encounter are inherent and in most cases unavoidable; and researchers denote that what predicts sporting achievement is what an athlete brings to an adversity, rather than the situation itself (Collins, MacNamara, & McCarthy, 2016). This view of athletic achievement is similar to the ABC(DE) framework central to REBT, where the Adversity (A) is accepted to be true/uncontrollable, instead it is one's belief (B) about the adversity that dictates the

functionality of one's response towards goal achievement. In the context of elite sport, an athlete's endorsement of irrational and/or rational beliefs to adversity (i.e., failure, rejection, or poor treatment) will dictate the extent by which emotions and behaviours are adaptive towards their ambitions and performance excellence. The protective and adaptive function of RBs for mental illness and goal achievement are heightened in elite sport, and as researchers suggest elite sport may also socialize and perpetuate the endorsement of IBs (Turner, 2016).

The commanding and controlling nature of sporting organisations often results in low levels of autonomy and high levels of athletic identity (Cresswell & Eklund, 2007). For athletes' who are unable to accept themselves as fallible and imperfect human beings (irrational view) are reported to be more susceptible to distress when encountering adversity, through harsh self-criticism and a focus upon personal inadequacies (Flett & Hewitt, 2005). A recent cross-sectional study reported a core rational belief of unconditional self-acceptance to be negatively associated with maladaptive perfectionism and burnout in junior elite soccer players (Hill, Hall, Appleton, & Kozub, 2008). Further, burnout has been positively correlated to major depressive disorders (Cresswell & Eklund, 2007). In a study of 46 Gaelic footballers assessed fluctuations in symptoms of burnout and IBs over an eight-week period (Turner & Moore, 2015). The findings reported baseline IBs significantly predicted increases in emotional and physical exhaustion (one dimension of burnout) over an eight-week period. Research also evidenced athletes with high levels of unconditional self-acceptance were more objective in their evaluation of their performance, less likely to denigrate those who provided negative evaluations, and to be significantly less defensive when receiving negative feedback (Chamberlain & Haaga, 2001). Ultimately, the core irrational belief of self-downing infers that an athlete would rate their entire self-worth upon one performance, rather than rating the behaviour alone (Kaplan & Flum, 2010). An athlete whose self-worth is contingent on their success may disproportionately heighten the negative consequences of failure prior to a

competition and experience unhealthy anxiety, or experience pro-longed low mood (i.e., unhealthy sadness) after performing poorly that will hinder goal achievement. Such a response is exemplified in the following quote:

“I ran to be known as the greatest runner, the greatest of all time. I could not eat or sleep for a week after I lost in the 1992 Olympics. I have to win or die.” (Noureddine Morceli, 1993).

The quote from Noureddine Morceli reflects an irrational view of success and/or failure prevalent within elite sport, where researchers indicate the endorsement of IBs has ramifications for one's psychological health and thus ability to perform. For example, an athlete who holds IBs will feel highly anxious (unhealthy negative emotion) before competition because the prospect of failing will conflict with their primary belief of demanding success (e.g., “I would like to win, therefore I absolutely must”) and irrationally reinforcing their secondary beliefs of awfulizing and self-downing (e.g., “if I do not win, it would be awful and therefore this would make me a complete failure”). Whereas, an athlete with RBs will feel concerned (healthy negative emotion) because the prospect of failing will to a lesser extent conflict with their preference for success (e.g., “I really want to win”) thus, reinforcing their secondary beliefs of anti-awfulizing and self-downing (e.g., “if I am not successful, it is not awful and it doesn't mean I'm a complete failure, instead I have only failed this time”; Turner & Barker, 2014a).

Irrational beliefs may also be detrimental for youth athletes in middle to late adolescence (the investment years; Côté, 1999), where participation in competitive sport can be extremely stressful (Goyen & Anshel, 1998). Although it is a transition that presents much opportunity, rather than focusing on nurturing athletic development, athletes can enter this period inherently fixated upon success, failure, and perceived self-worth. Here shifts can be made from a strong preference of success (“I more than anything want to perform well, but

there is nothing to say that I must”) to a demand (“I more than anything want to perform well, and therefore I must”). This has important ramifications for athletes in late adolescence who are approaching athletic, psychological, psychosocial, and academic/vocational transitions (e.g., Wylleman & Lavallee, 2004).

In U18’s professional soccer academies, players making the final and competitive transition into professional soccer are exposed to ego driven climates, typified by a win at all costs mentality that is largely reinforced by coaches, parents, and the athletes themselves (Harwood, Drew, & Knight, 2010). Being ill-prepared for missing the cut can exacerbate an athletes IBs (e.g., “I must make it, otherwise it would be terrible and would make me a complete failure”), encouraging an irrational and motivational shift from “want to” to “have to.”. Turner, Slater, and Barker (2014) suggested that it is the coming together of IBs and the pressured nature of academy settings (i.e., sporting environments) that encourages the development of unhealthy negative emotions in response to adversity. This having significant implications for both well-being and performance (Cockerill, 2002).

Amongst the psychological challenges (i.e., organisational and competitive), in some cases (i.e., professional athletes) athletes are protected against the hardship and injustice members of the general population experience. When travelling to competition/tournaments, travel, logistics, clothing, and accommodation are all arranged by the team manager. Athletes are guided on dietary intake, training plans, access to high-class facilities, and expert medical support/advice that is not available to members of the public. Paradoxically, this exceptional treatment and regular experience of bespoke training may encourage an irrational shift from “I want to be” to “I must be treated” fairly/respectfully otherwise it would be “terrible” and “this would be intolerable” (Botteril, 2005).

Collectively the evidence indicates IBs are deleterious for psychological outcomes relevant to mental health. Furthermore, elite sport presents a highly demanding context in

which an athlete is expected to function in the pursuit of performance excellence. In addition, social and cultural environments appear to perpetuate the prevalence of IBs.

Accordingly, not simply does the context of elite sport offer an appropriate laboratory in which to investigate the effects of irrational and rational beliefs on performance; REBT may offers a promising intervention that provides athletes with the foundations on which to function adaptively and pursue performance excellence.

2.4.3. The application of REBT in sport. REBT may offer a novel and meaningful technique that first, targets the root cause of an individual's psychological issues (Dryden & Neenan, 2015) for both able bodied and athletes with a disability. Second, pro-actively instilling a rational philosophy that allows athletes to better manage, overcome, and function when encountering both acute and chronic stresses. In turn having implications on both psychological health and athletic performance (Turner, 2016). In 1994, Albert Ellis hypothesised the association between core RBs (e.g., unconditional self-acceptance) and IBs (e.g., frustration intolerance) with participation in exercise and sport. For example, those with a high frustration tolerance were considered to better tolerate the physical and psychological discomfort and overcome short-term hedonic costs typical of physical activity. Although partially alluding to the benefits of RBs and sporting performance, Ellis (1994) provided no empirical support for such claims and largely focussed the commentary towards exercise behaviours. Considering research in stress, emotion, coping, and performance is an area of major investigation within sport psychology literature (Lindahl, Stenling, Lindwall, & Colliander, 2015), few have drawn associations between the applicability of REBT and athletic performance.

To explain, researchers proposed this brevity (see Appendix 1.1 for a collated overview of REBT literature in sport) may have been explained by the clinical

connotations surrounding REBT (Marlow, 2009), and that concepts specific to REBT are often implicitly referred to within the sport psychology literature without reference to the originating theory (Larner, Morris, & Marchant, 2008). Further, during the 1980's and 1990's it was commonly believed that therapeutic-based approaches were only applicable for the treatment of severe psychopathology with the mentally disordered, whereas psychological skills for performance development offered the only logical means of enhancing performance (Silva, 1989). Accordingly, prior to the last decade (pre-2005) much of the literature in sport psychology remained fixated on second wave conceptualisations of human performance (Gardner & Moore, 2006). Nevertheless, and more recently there has been an increase in sport psychologists investigating and applying interventions traditionally associated with clinical contexts. For example, a prominent approach used by sport psychologists is the cannon of psychological skills (Andersen, 2009). Such techniques include: goal setting, self-talk, pre-performance routines, relaxation, and imagery to enhance performance. Although largely based on the principles of CBT, REBT is distinct to Psychological Skills Training (PST). To illustrate using the ABC (DE) model, PST primarily focuses upon altering the adversity (A) or the emotional (i.e., imagery), behavioural (i.e., pre-performance routines), and cognitive consequences (C; i.e., self-talk). Whereas, REBT is focussed upon altering an individuals evaluative cognitions, that is their beliefs (B) about the adversity (A) in turn facilitating a functional response (C) and providing a elegant and fundamental change within the client (Dryden & Neenan, 2015). Albeit, PST is proposed to be a valuable cornerstone of applied sport psychology some athletes require greater and more fundamental changes in their beliefs (B) to overcome issues that have disturbed their performances (Turner & Barker, 2014a).

Not restricted to REBT, alternative models originally associated with clinical contexts have emerged within the existing literature. For example, mindfulness and acceptance based models (see Gardner & Moore, 2012) have been introduced as a tool to enhance athletic performance and the overall psychological well-being of athletes. Therapies based on emotional freedom techniques, such as eye movement desensitisation reprocessing (EMDR) have been utilised as a less conscious intervention. Typically used to treat trauma victims, EMDR has been evidenced to manage anxiety based disorders in sport (i.e., yips, lost movement syndrome; Bennett, Hays, Lindsay, & Olusoga, 2013; Rotheram, Maynard, Thomas, Bawden, & Francis, 2012). Furthermore, principles of motivational interviewing (Miller & Rollnick, 2002) that establish a strong therapeutic alliance are purported to be paramount in establishing a relationship and eliciting behaviour change in sport psychology consultations (Tenenbaum & Eklund, 2007). In sum, the application of clinical models within the sporting context marks a shift in perspective for effective interventions to enhance an athlete's psychological wellbeing and performance. To this end, to supplement the largely anecdotal accounts of practitioners adopting REBT (e.g., Winter & Collins, 2015; Rumbold et al., 2012) there exists an emerging line of applied research that has harnessed elite sport as a valuable and appropriate setting in which to garner the effects of REBT, and IBs and/or RBs on markers of performance.

Previous researchers have predominantly focused largely on the effects of REBT on emotional consequences. However, psychologists are able to investigate humans on four levels: behavioural, cognitive, subjective experience (i.e., emotions), and physiological processes (David & Cramer, 2010). The following section draws upon the REBT and sport psychology literature to review the effects of REBT and the

association between IBs and/or RBs on emotions and cognitions associated with athletic performance, physiological consequences, and performance itself.

2.5 REBT and Anxiety

2.5.1. Competitive anxiety and performance. Psychologists have also explored the areas of stress, emotion, coping, and closely related topic areas such as choking under pressure, burnout, and fear of failure in an attempt to enhance athletic performance (Lindahl et al., 2015). Amongst such topics the relationship between competitive anxiety and sports performance is one of the most investigated strands of research within sport psychology (Woodman & Hardy, 2001). Early research within sport psychology hypothesised that anxiety negatively effected performance, however this view was purported to be an over simplification (Cheng, Hardy, & Markland, 2009). From an evolutionary perspective anxiety was suggested to offer functional qualities that protect and prepare an individual to deal with threatening situations (Ohman, 2000). Accordingly, researchers put forth anxiety to harbour functional qualities towards performance. For example, anxiety may energise and focus ones attention (Carver & Scheier, 1986) as well as enhance ones motivational qualities (Eysenck, 1992). As a result, Jones (1995) proposed the model of debilitating and facilitative competitive state anxiety. That is, when encountering an important competition an athlete will perceive their symptoms of anxiety as either facilitative (i.e., helpful) or debilitating (i.e., unhelpful), whereby, facilitative anxiety has been associated with higher levels of performance in comparison to debilitating anxiety (Jones, Swain, & Hardy, 1993). Research suggested the directional interpretation to be determined by an athlete's perception in their ability to cope with environment in the pursuit of their goal (Jones, 1995). Therefore, irrespective of the intensity, an athlete directional interpretation was deemed an important predictor of performance (Jones & Hanton, 2001). To explain, two separate athletes could perceive the same intensity of somatic anxiety (i.e., increased heart rate), whereas depending

on their perceived control one athlete could perceive these symptoms as facilitative, whilst the other would perceive it as debilitating towards their performance. Considering the importance of anxiety towards athletic performance there exists a line of research that examined the effects of REBT on competitive anxiety using the context of elite sport.

2.4.2 Effects of REBT on anxiety in sport. Practitioners first conducted an applied examination into the effects of a group psycho-education programme on 40 Australian rules football players (Bernard, 1985). The findings showed participants reported enhanced perceptions of control and subjective improvements in their performance. Although promising the programme also included concentration training and goal-setting strategies therefore making the precise effects difficult to discern. Following this, researchers investigated the effects of six one-to-one REBT psycho-education sessions on heightened anxiety in six female collegiate gymnasts (Elkow & Ostrow, 1991). The findings showed reductions in anxiety in five out of the six gymnasts, as well improved performance in three of the six gymnasts. Additionally, using five lecture based REBT sessions researchers reported significant reductions in trait anxiety in 11 high school female soft-tennis players after receiving five lecture-based REBT sessions (Yamauchi & Murakoshi, 2001). Collectively, the findings supported the application of REBT as an effective intervention to reduce anxiety in elite athletes. However, concrete conclusions regarding the effects on performance were difficult to draw due to the lack of objective markers, control groups, and lack of detail concerning the intervention delivery (Turner et al., 2014). In an attempt to overcome previous shortcomings more recent research attempted to conduct a more systematic and rigorous examination into the effects of REBT on competitive anxiety.

First, researchers examined the effects of six 90-minute group REBT workshops on the directional interpretation of trait anxiety in 60 competitive ten-pin bowlers (Larner, Morris, & Marchant, 2007). In comparison to both a traditional anxiety management

(imagery + relaxation conditions) intervention and a control group the results showed the REBT intervention significantly reduced participants IBs and enhanced a facilitative interpretation of trait anxiety. These findings indicated that rather than reducing ones anxiety the reduction of IBs brought around shifts in directional interpretation (facilitative vs. debilitating). Indeed, such findings draw comparisons to the healthy (concern) and unhealthy (anxiety) emotions described in REBT theory. To support such findings qualitative research reported self-directed demands and evaluations of awfulizing propagated feelings of debilitating anxiety; whereas facilitative anxiety was reported to precede a lower frequency of self-directed demands within ten-pin bowlers (Larner et al., 2008). To continue the investigation, Turner and Barker (2013) examined the effects of three one-to-one REBT counselling sessions (20 minutes) and two homework assignments in four elite youth cricketers. Although, not assessing the directional interpretation the findings reported reductions in IBs, cognitive anxiety, and subjective improvements in performance.

Using a workshop format, researchers reported short-term reductions in IBs in elite soccer academy athletes after receiving a single REBT session (Turner et al., 2014). Furthermore, after receiving three REBT workshops elite soccer academy players reported long-term reductions in IBs (i.e., need for achievement and demand for fairness) and both psychological and performance benefits (social validation data; Turner, Slater, & Barker, 2015). Collectively, the applied findings evidenced that REBT was effective in reducing IBs and bringing about meaningful changes in anxiety, either through reductions or shifts in directional interpretation. To explain these findings Turner and Barker (2013) suggested two possible mechanisms by which REBT may have brought around changes in anxiety. First, IBs were thought to negatively distort an athletes perception (or inference) of an event and perceiving it as too demanding in comparison to their perceived coping resources (Lazarus & Folkman, 1984). Therefore, the process of replacing IBs with rational alternatives may lead to

more functional inferences of important competitions, and a reduction in cognitive anxiety. Second, IBs augment the negative ramifications of failure, and thus elevating the severity of cognitive anxiety, whereas RBs whilst sufficiently motivating the athlete for performance, reduce the gravity of potential failure, in turn reducing cognitive anxiety. In sum, the research indicates REBT was effective in reducing IBs and anxiety within elite athletes, using both one-to-one and group based modalities. However, such studies were largely focussed on ascertaining changes in IBs and anxiety (Turner & Barker, 2014), and reliant upon subjective measures (e.g., self-report, social validation). Emotional consequences to adversity are not experienced in isolation (David & Cramer, 2010) as such researchers have also examined the effects of REBT on cognitive consequences.

2.6 REBT and Cognitive Consequences

2.6.1. Irrational beliefs and cognitions. REBT theory proposes IBs generate cognitive consequences, such as inferences/descriptions (i.e., people's hypotheses, or conclusions, about events) that are less functional compared to those generated by RBs (David, 2003). To illustrate an athlete who harbours IBs about an important upcoming competition, may feel anxious (unhealthy negative emotions) and may generate dysfunctional cognitive consequences (e.g., overestimating the probability of threat or experiencing task irrelevant thoughts; Dryden & Branch, 2008). Whereas, for an athlete who harbours RBs will feel concern (healthy negative emotion) and lead to functional cognitive consequences; for example: being realistic about the probability of threat occurring, realistic appraisal of coping with the situation, and greater number of task relevant thoughts (Dryden & Branch, 2008). Not restricted to anxiety, the functional distinction in cognitive consequences is also prevalent across other emotional responses (e.g., depression vs. sadness, unhealthy vs. healthy anger, guilt vs. remorse). For example, an individual who experienced healthy anger would not see malicious intent in others actions and therefore better able to empathise with

others perspective, whereas those who experience unhealthy anger would see malicious intent in the motives of others and plot exact revenge (Dryden & Branch, 2008), the former presenting a noticeably adaptive cognitive consequence compared to the latter. Furthermore, when encountering adversity (A) IBs (B) are proposed to exaggerate and lead to an unhelpful cognitive consequence (C) that becomes a distorted perception (A) (or inference; Ellis & Dryden, 1997), subsequently the following IBs serves to propagate a somewhat dysfunctional cognitive cycle of IBs and unhelpful cognitive consequences.

Previous research has examined the association between irrational/rational beliefs and specific cognitive consequences. In an early study by Harrel, Chambless and Calhoun (1981) 220 undergraduate students were asked to answer a series of questions based upon five hypothetical situations. The findings reported IBs were positively associated with the frequency of negative self-statements. However, much like early REBT research the measures of IBs were criticised for being contaminated with affective items, thus artificially increasing the association between IBs and emotional disturbances (David & Cramer, 2010). In light of this, using newer measures the association between IBs and specific automatic thoughts were replicated (e.g., Bond & Dryden, 1997; Bond & Dryden, 2000). Whilst both constructs (Automatic thoughts and IB) appear to be related and independently evidenced to predict emotional reactions in stressful situations, the relationship between these items as predictors of psychological distress has received little empirical examination. For example, Szentagotai and Freeman (2007) examined the relationship between IBs and automatic thoughts as predictors of psychological distress. Results reported that both IBs and automatic thoughts (or cognitive consequence) were related to distress and that the association between IBs and distress was mediated by their automatic thoughts.

Research shows that when encountering stressful situations core IBs (B) interact and evaluate the activating event (A), that in turn lead to specific automatic thoughts that are less

functional and contribute to psychological distress. Accordingly, the assessment of cognitive consequences may offer a valuable indicator of enhanced functioning. However, researchers have failed to evidence the corresponding associations with behavioural outcomes indicative of enhanced functioning/performance. As such the sport psychology and more specifically the self-talk literature offers a fruitful means by which to examine and assess the effects further.

2.6.2. Cognitive consequences in sport. Within the sport psychology literature cognitive consequences are comparable to an individual's self-talk, in turn having implications on athletic performance. The mental skill of self-talk is frequently included and proposed to be an essential part of sport psychology interventions (e.g., Hanton & Jones, 1999). Overcoming previous shortcomings, a review by Hardy (2006) conceptualised self-talk as verbalisations or statements to the self, that are multidimensional in nature, that have interpretive association with content of statements, somewhat dynamic, and serve an instructional and motivational function. Previous research has evidenced self-talk to serve seven functions, these include: valence (e.g., positive vs. negative), overtness (e.g., internal vs. external), self-determined self-talk (e.g., perception of choice over self-talk), motivational (e.g., motivational interpretation of self-talk), functional (e.g., instructional vs. motivational) and the frequency of self-talk (Hardy, 2006).

Whilst self-talk may constitute many of the aforementioned functions much research within self-talk has focussed on valence (e.g., positive vs. negative). However, findings reporting associations between positive and negative self-talk and positive performance outcomes remain largely equivocal (e.g., Van Raalte, Cornelius, Hatten, & Brewer, 2000). Instead, researchers posit self-talk can be better characterised in terms of facilitative and debilitating dimensions (Peters & Williams, 2003). To clarify the functionality (helpful vs. unhelpful) of one's cognitive consequences towards goal achievement and ultimately

performance, research in attentional focus may offer a productive and objective line of investigation.

2.6.3. Cognitive anxiety and attentional focus. The effects of self-talk are proposed to influence an athlete's attentional shift (Landin & Herbert, 1999). Nevertheless, as proposed in REBT theory fluctuations in an athlete's attention could be indicative of functional/dysfunctional cognitive consequences. Specifically, research within cognitive anxiety may serve as a starting platform to further understand the influence of irrational and rational beliefs on cognitive consequences and more specifically attentional focus. Within the sport psychology literature cognitive anxiety is not defined as an unhealthy negative emotion, instead referring to an athlete's response to a perceived threat and is often associated with worry, cognitive forms of apprehension that are associated with unfavourable outcomes (Cheng et al., 2009). Cognitive anxiety in an athlete may manifest in different patterns of attentional focus and impact performance. For example, anxiety has been shown to increase the conscious control of movements and result in performance decrements (Baumeister, 1984). Self-focus has also been characterised as a state of heightened awareness of self-shortcomings regarding performance when encountering stress (Cheng et al., 2009). Therefore, individuals who are anxious scan the environment for cues and become overtly pre-occupied with the self (Wicklund, 1991). This proposition is consistent with the assumption that a cognitive bias to focus on internal threat-related stimuli is a vulnerability factor in trait anxiety (Calvo & Cano-Vindel, 1997). Although, such research is focussed upon debilitating effects of cognitive anxiety on attentional focus, research also proposes a two-patterned response in attentional shifts as a consequence of cognitive anxiety.

Anxiety is proposed to take up and reduce an athlete's cognitive resources available for a task (Janelle, 2002), and direct attention to task irrelevant stimuli (Wilson, 2008). However, research has reported such debilitating effects can be offset by an athlete's

confidence in being successful, hereby allocating extra mental resources to the task and maintaining performance whilst under high levels of anxiety (Eysenck & Calvo, 1992). Contemporary research has reported threat states to be associated with disrupted gaze control during sporting (e.g., Moore, Wilson, & Vine, 2013) and surgical performance tasks (Vine, Freeman, Moore, Chandra-Ramanan, & Wilson, 2013). Most recently Vine et al. (2015) examined the effects of stress on 16 commercial pilots attention control patterns. The results reported that pilots who appraised the situation as more threatening recorded higher search rates and a reduced ability to inhibit distraction from threatening stimuli, subsequently, disruptions in eye gaze were associated with reductions in simulator performance under stress. The available evidence demonstrates the effects of anxiety on impaired/enhanced attentional shifts indicative of a challenge or threatened state when approaching a stressful performance situation.

Although, not explicitly associated with REBT theory, on theoretical grounds this line of research shares a fundamental premise, that one's cognitive appraisals is central (Lazarus, 1991) in determining functional/dysfunctional responses, which may impact and predict performance when encountering stressful situations. Whilst promising, no research has used objective eye gaze markers to examine the effects of IBs/RBs on the functionality of cognitive consequences and performance. To this end, the measurement of attentional focus presents an objective means to test the postulations of REBT theory, as well elucidate the associations by which irrational/rational beliefs may influence performance. As outlined in the previous sections humans can be assessed cognitively (e.g., cognitions, processes) and subjectively (e.g., emotions). Additionally, previous researchers have begun to use physiological outcomes as objective means to explore the effects of IBs/RBs on human functioning.

2.7 Physiological Consequences and Performance

Within the literature the association between irrational and/or rational beliefs has largely been studied using verbal reports of feelings, and very few have utilised objective markers to better test the postulations of REBT (Ellis et al., 2010). Further, an individual's IBs and RBs in some instances are thought to process outside of one's awareness; consequently, compounding the inherent limitations of self-report measures (Blascovich & Mendes, 2000; David et al., 2005; Williams & Krane, 1992). Providing greater objectivity, there exists a line of research that use psychophysiological measures to predict athletic performance during motivated performance situations (Turner, Jones, Sheffield, Barker, & Coffee, 2014; Turner, Jones, Sheffield, & Cross, 2012). Drawing on the biopsychosocial model and the theory of challenge and threat states in athletes (TCTSA; Jones et al., 2009) researchers have evidenced that task performance situations can be evaluated as challenging or threatening depending on a distinct two-patterned cardiovascular response (Blascovich & Mendes, 2010). For those who evaluate an upcoming performance as threatening exhibit increased vascular resistance and reduced cardiac efficiency, whilst people who evaluate their situation as challenging exhibit increased cardiac efficiency and decreased vascular resistance (Turner et al., 2014). Considering the value of physiological measures to objectify the effects of irrational and rational beliefs, the area has received little attention, and no studies have drawn associations with performance.

2.7.1. Physiological consequences. From the scant evidence base Rimm and Litvak (1969) conducted the first examination into the effects of irrational and rational beliefs on physiological consequences; Specifically, using a self-verbalisation paradigm they examined the physiological effects of irrational self-verbalisations on galvanic skin response (GSR), respiration rate, and respiration depth. Nonetheless, the results reported that the irrational self-statement had no significant effect. Furthermore, the findings were criticised for the inaccurate definition of irrational self-statements, instead conceptualising them as a

combination of inferences and negative cognitive evaluations. In development, a study by Goldfried and Sobocinski (1975) reported that those holding greater IBs about social rejection were associated with higher self-reported physiological/emotional arousal compared to those who did not hold such beliefs. However, this study was criticised for the lack of both objective physiological measures and distinction between emotional and physiological arousal. Using objective measures of galvanic skin response Master and Gershman (1983) examined distinctions in physiological arousal between rational and irrational self-verbalisations. Results showed in response to a stimulus situation (i.e., statement sentences) a significantly greater galvanic skin response was recorded in reaction to the irrational self-statements compared to rational and neutral control statements. However, the authors proposed that the conditioning rather than REBT theory better explained the study findings.

Previous research failed to clearly define emotional and physiological arousal, as well excluded key indicators of physiological arousal such as blood pressure (Harris et al., 2006). Furthermore, an overreliance on correlational designs prevented the identification of causal effects of IBs/RBs on physiological outcomes (e.g., Goldfried & Sobcinski, 1975). As such, the precise effects of IBs and/or RBs across a variety of physiological outcomes remained unclear. In development, a study by Harris et al. examined the distinction in psychological and physiological responses to a real-life stressful situation between those who harbour IBs compared with RBs. The results reported those who held IBs displayed increases in systolic blood pressure, whereas those with RBs showed decreases in diastolic blood pressure. To explain Harris et al. purported that mental rigidity (i.e., IBs) was matched by autonomic rigidity (i.e., increased systolic blood pressure), whereas mental flexibility (i.e., RBs) was associated with autonomic flexibility (i.e., reduction in systolic blood pressure). This study went beyond previous research, providing an objective marker that supported a two-patterned distinction in emotion and physiological consequences of irrational and rational beliefs (Ellis

& DiGiuseppe, 1993). In addition, such findings highlighted the benefits of REBT as an intervention to enhance physical health. Moving beyond physiological measures researchers used biological indicators to examine the postulation that RBs are accompanied by biological indicators of health, whereas IBs are associated with ill-health (i.e., disease related physiological responses; David & Cramer, 2010). In a cross-sectional study of 853 healthy adults, researchers reported IBs to be positively correlated to C-reactive protein, interleukin-6, tumour necrosis alpha factor, and white blood cells. Hereby suggesting that IBs were associated with indicators of increased inflammation in a healthy population (Papageorgiou et al., 2006). In addition, IBs have been associated with a higher frequency of chronic illnesses (Lichtenberg, Johnson, & Arachtingi, 1992), more severe asthma symptoms (Silverglade, Tosi, Wise, & D'Costa, 1994), eating disorders (Moller & Bothma, 2001), and bulimia (Phillips, Tiggemann, & Wade, 1997).

The precise relationship between irrational/rational beliefs and physiological responses are complex and results have been varied (David, 2014), in light of this questions are asked as to under what conditions, and how are physiological indicators affected by IBs and RBs (David et al., 2005). Thus, greater examination is required into the understanding the hypothesised mechanisms and associations between the two constructs. Physiological markers may also offer an objective marker to better examine and ascertain the effects of REBT, and irrational and rational beliefs on human behaviour and performance when responding to adversity.

2.8 REBT and Motor Performance.

2.8.1 Effects of irrational and rational manipulations on performance. An early line of research used experimental manipulations to investigate the effects of irrational/rational cognitions (self-verbalisations) on behavioural performance using a variety of visual-spatial tasks (e.g., trail making and mirror tracing tasks). Specifically, such studies

were based on the hypotheses that IBs are proposed to lead to an exaggeration of the importance of performing well and being accepted by others, which lead to unreasonable and self-imposed demands that are largely unattainable (Bonadies & Bass, 1984). Whereas, RBs are proposed to reduce excessive concerns of failure and likely to lead to healthy negative emotion (e.g., concern) and exert a positive influence on performance.

First, researchers reported irrational self-talk led to significantly more errors on a mirror-tracing task compared to rational self-talk and a control condition (Schill, Monroe, Evans and Ramanaiah, 1978). Furthermore, irrational self-talk was reported to be associated with underachievement and reduced behavioural efficiency, whereas rational self-talk was reported to have a facilitative effect on task completion (Bonadies, & Bass, 1984; Schill et al., 1978). Although the findings suggested IBs were unhelpful, whereas RBs helpful for performance, alternative studies partially contradicted these findings. Research showed that irrational self-verbalisations were associated with significant increases in state anxiety prior to a difficult performance task, however neither irrational or rational verbalisations were related to persistence during an impossible puzzle task (Rosin & Nelson, 1983). These studies provide partial support for the hypothesis linking IBs, dysfunctional emotions and self-defeating behaviours (as evidenced by reduced task performance). Nonetheless, findings remain equivocal due to a lack of critical mass of research, a sole reliance on self-report measures, statistically underpowered samples, exclusion of control group/conditions, and favouring the use of artificial procedures (Harris et al., 2006).

To further examine the effects of IBs/RBs, as well the value of REBT as an intervention to promote adaptive behaviours in response to adversity, researchers have utilised case-studies with athletes in elite sport. More recently Si and Lee (2008) investigated the effects of REBT as a psychological skills program with an elite table-tennis players behaviours commonly associated with frustration intolerance during major competitions.

Using a detailed triangulated methodology for assessment (i.e., video footage, interviews, observations, and self report measures), the results showed that REBT was effective in reducing the athletes maladaptive behaviours. As a result both the athlete and coach credited the intervention for the success at the 2004 and olympic games. Using a similar approach and again integrated into a psychological skills program Marlow (2009) examined the effects of a series of one-to-one REBT sessions with an elite youth ten-pin bowler. Retrospectively the athlete reported subjective improvements in adaptive behavioural changes and performance.

Collectively, these findings support the promising effects of REBT on adaptive behavioural changes indicative of enhanced performance within ecologically valid settings. Furthermore, through the experimental manipulation of irrational and rational approaches to performance tasks previous studies indicate IBs may hinder behavioural outcomes and ultimately performance. Nevertheless, these studies failed to objectively assess performance, used REBT as part of a broader psychological-skills programme, and have not compared its effects with alternative interventions and/or control groups. Hence, conclusions regarding the efficacy of REBT intervention remain difficult to draw. Ultimately, to date there is little empirical research that has been dedicated to examine the effects of REBT on objective markers of performance within athletic contexts.

2.8.2. REBT and athletic performance. In sport a successful performance is in part considered a function of an athletes' ability to psychologically deal with the demands of competition (Jones et al., 2009); and one's beliefs about adversity may impact an athletes ability to perform. According to REBT theory IBs lead to unhealthy emotions, maladaptive cognitions, and behaviours (Dryden & Branch, 2008), thus suggestive of reduced performance that hinders goal achievement. Instead, RBs lead to healthy emotions adaptive cognitions, and behaviours that may help performance and facilitate goal achievement.

In 2003, Goldman first documented the application of REBT as a psychological skills package for athletic performance as a pamphlet written for dissemination at the Albert Ellis Institute (Centre for REBT). Specifically, Goldman (2003) explained the mechanisms by which REBT as a self-talk tool modifies both the competitor's arousal level and the resulting impacts on primary and secondary disturbances. Subsequently, rational self-talk would be associated with healthier levels of arousal and skill execution, in part drawing similarities between REBT and Hanins' Individual Zones of Optimal Functioning (IZOF) model. Furthermore, Goldman (2003) predicted the debilitating effects of irrational self-talk on the functionality of emotion, arousal level (percentage), and the functionality of the subsequent behaviours, that in turn predicted athletic performance. Although plausible, no empirical investigations were provided to support such postulations and therefore remained untested.

Within the literature there exist few studies that have attempted to report the effects of REBT on athletic performance, from which most studies have favoured the adoption of subjective and anecdotal accounts to support the efficacy of REBT. For example, Bernard (1985) applied a rational emotive training program with Australian Rules football players. The data showed athletes were better able to control their thoughts to directly influence performance. As well, previous researchers studied the effects of REBT on anxiety and important psychological outcomes utilising social validation to garner perceived benefits on athletic performance (e.g., Turner & Barker, 2014a). Again, whilst such findings are promising there are no studies that equivocally indicate IBs are detrimental for performance, neither is there evidence that the rigorous application of REBT brought about objective changes in athletic performance.

2.9 Rationale for the Current Program of Research

The positive effects of REBT on psychological health and the detrimental effects of IBs on psychological distress (i.e., emotion) are established and empirically supported within

both clinical and non-clinical populations (Lyons & Woods, 1991; Višlā et al., 2016). Furthermore, the ABC(DE) model used within REBT is proposed to offer a model of optimal human functioning (David et al., 2010b). Nonetheless, research investigating the effects of REBT and IBs and/or RBs on human behaviour (Szentagotai & Jones, 2010) and performance is sparse and largely ignored in comparison to the plethora of research investigating the effects on psychological health. This is surprising considering REBT may offer a potentially valuable intervention to promote both psychological health and performance (Turner, 2016).

Collectively, from the available evidence researchers indicate that when encountered with adversity (e.g., failure, rejection, or poor treatment) IBs will lead to maladaptive and unhealthy, emotional, cognitive, physiological, and behavioural consequences indicative of reduced athletic performance. Where, instead RBs will lead to adaptive and healthy alternatives indicative of enhanced athletic performance. Moving beyond the original application of REBT as a psychotherapeutic intervention there is an emerging line of research that examines the use of REBT as a tool for performance enhancement. From a methodological standpoint, the context of elite sport offers an appropriate laboratory and stimulus to explore the potential value of REBT on performance. Although, the findings have been promising, research in the area has largely focused on the measurement of anxiety and subjective changes in performance (e.g., Turner & Barker, 2013, Turner et al., 2014; Turner et al., 2015). Hereby, failing to include cognitive, physiological, behavioural, and objective performance markers that may better elucidate the effects of REBT on athletic performance. In addition, researchers have integrated REBT within a psychological skills program making the precise effects that is the reduction in IBs and promotion of RBs on the outcomes difficult to ascertain. Furthermore, while the use of case-based approaches appears to glean idiosyncratic insights within ecologically valid settings, these studies do not provide an

empirical, rigorous, or systematic investigation into the precise effects on athletic performance or outcomes associated with superior performance (e.g., Si & Lee, 2008; Marlow, 2009). Previous experimental studies have suggested an irrational approach compared to a rational one may hinder performance (e.g., Bonadies & Bass, 1984; Kombos et al., 1989; Schill et al., 1978). However promising, methodological shortcomings (i.e., lack of control groups, the use of imagined rather than real life scenarios; multi-modal interventions), population sample(s), reliance on subjective measures of emotion (i.e., anxiety) and performance (i.e., social validation), and a lack of critical mass constrain the generalisability of the findings.

In sum, REBT is an effective intervention that has been shown to enhance psychological health (David et al., 2005), but whether and to what extent REBT can promote performance is yet to be fully understood. The primary aims of this PhD thesis were to first, conduct an examination into the effects REBT on psychological, physiological, and performance outcomes with elite athletes; and second, to examine the associations between irrational and rational self-statements on key psychological outcomes and markers of performance. As such, elucidating a nuanced view into the effects of irrational and rational beliefs on adaptive functioning that has been under represented within the contemporary. Finally, the secondary aim of this PhD thesis was to provide professional practice insights into the application of REBT with elite athletes (able-bodied & a physical disability).

Part I: Applied Phase

Chapter 3

Developing Performance Using Rational Emotive Behaviour Therapy (REBT): A Case-study with an Elite Archer.

3.1 Introduction

The literature review details the theory and research of REBT, highlighting how the ABC(DE) model offers a valuable intervention to develop performance and facilitate goal achievement. The review delineates the effects of irrational and rational beliefs on the functionality of emotions, behaviours, cognitions, physiology, and ultimately performance when encountering adversity. Within part I of the present thesis elite sport has been used as an appropriate achievement context in which to further understand the effects of REBT, and irrational and rational beliefs on performance. However, whether and to what extent REBT can promote performance has received little attention and yet to be fully understood. The aim of the present chapter was to report a case-study that provided an idiographic examination into the application and effects of one-to-one REBT programme on important psychological and performance outcomes with an elite archer.

Although scant, early REBT researchers reported the promising effects of REBT on athletic performance (e.g., Bernard, 1985; Elko & Ostrow, 1991). Most recently, a line of research systematically investigating the effects of REBT on athletic performance has emerged. To illustrate, Larner et al. (2007) reported that reductions in IBs and increases in RBs decreased the negative directional interpretation of anxiety experienced by athletes. Furthermore, elite youth cricketers reported reductions in IBs and cognitive anxiety after receiving three, one-to-one REBT sessions (e.g., Turner & Barker, 2013). Using a workshop-based modality, elite soccer academy athletes reported short-term reductions in IBs after receiving a single REBT workshop (e.g., Turner et al., 2015), as well as long-term reductions in IBs after receiving multiple REBT workshops (e.g., Turner et al., 2014). Collectively, research demonstrates the potential of REBT to develop important psychological outcomes

relevant to athletic performance. However, to date this research has not used objective markers of performance to better ascertain the effects of REBT, as well how changes in individuals IBs and/or RBs may influence athletic performance.

All humans have a propensity for both rational and irrational beliefs, where individual differences are buffered by biological traits and cultural/educational influences (Neenan & Dryden, 2004). The dysfunctional and maladaptive responses associated with IBs are magnified within sport where athletes are expected to thrive when encountering competitive, organisational, and personal stressors in pursuit of performance excellence (Weston, Thelwell, Bond, & Hutchings, 2009). An athletes' inherent fixation upon success and failure, perceived self-worth, and an experience of high quality treatment may encourage an irrational shift from "want to" to "have to" (Botterill, 2005). REBT aims to facilitate profound change in one's thinking, feelings, and behaviours, shifting from an irrational to a rational philosophy that addresses the root cause of a symptomatic issue. Ultimately, a rational philosophy accelerates an individual's recovery from failure towards constructive goal directed actions.

Research suggests that individuals' beliefs are comparable to that of a primary appraisal (Lazarus, 1991), hereby, influencing an individual's particular representation of reality (Hyland & Boduszek, 2012). Therefore, irrespective of the adversity, athletes have autonomy over their emotional and behavioural response (i.e., functional/helpful vs. dysfunctional/unhelpful responses; Dryden & Neenan, 2015). It is both unrealistic and unhelpful to expect an athlete to respond indifferently, or with immediate positivity after experiencing an adversity (e.g., failed selection), instead REBT encourages a healthy negative response (Dryden & Neenan). Within the anxiety-performance literature the regulatory subcomponent of the three-dimensional model (Cheng et al., 2009) re-conceptualises and supports the adaptive vs. maladaptive distinction in negative emotions.

Explicitly, athlete's perceived control to cope and attain goals under stress is proposed to influence both the intensity and adaptive quality of anxiety. For example, an athlete who holds IBs will feel highly anxious (dysfunctional emotion) before a major competition because the prospect of failing will conflict with their primary belief of demanding success (e.g., "I would like to win, therefore I absolutely must") and irrationally reinforcing their secondary beliefs of awfulizing, and self-downing (e.g., "if I do not win, it would be awful and therefore this would make me a complete failure"). An athlete would then place greater demands on themselves, in turn reducing their perception of control and coping. Whereas, an athlete with RBs will feel concerned (functional emotion) because the prospect of failing will to a lesser extent conflict with their preference for success (e.g., I really want to win), thus, reinforcing their secondary beliefs of anti-awfulizing and self-downing (e.g., "if I am not successful, it is not awful and it doesn't mean I am a complete failure, instead I have only failed this time"; Turner & Barker, 2014a). Athletes with RBs will place less demand on themselves and experience a greater perception of control.

The investigation of REBT and sporting performance whilst emerging remains sparse (Turner & Barker, 2014a), additionally there exists no case study documenting the application and effects of REBT with an elite athlete, using both psychological and actual measures of performance. Further, few studies (e.g., Turner et al., 2015) have examined the acute and maintained effects of REBT. The value of case studies for sport psychologists has been brought to recent attention, providing a beneficial insight into the application, influence, and effects of sport psychology interventions (Giges & Van Raalte, 2012). In-line with aims one of this thesis, the present case study examined the effects of a one-to-one REBT programme with an elite athlete on IBs, self-efficacy, perception of control, and athletic performance. In addition, meeting aims three of the thesis the present case provided a detailed practitioner account and an athletes experience throughout the entirety of an REBT

program, informing practitioners looking to adopt REBT within their practice. The participant provided informed consent to undertake the research and institutional ethics approval was granted for the procedures of the study (see Appendix 2.2).

3.2 Needs Analysis

Zara (Pseudonym) was a 44-year-old nationally ranked elite level archer who had been competing in archery at this level for 4 years, representing both county and district teams. Zara trained four days a week split between the local and regional archery centres. Initially, a meeting was organised with Zara by the consultancy team (lead and second author). The use of consultancy teams has been advocated as an effective way of developing the consultancy process and supporting the training of neophyte and current sport psychology practitioners (Pitt, Thomas, Lindsay, Hanton, & Bawden, 2015). During the initial contact with Zara she presented exaggerated bouts of anxiety prior to and during competition, which was having a detrimental effect upon her performance. In addition, these dips in performance were exemplified during indoor archery competitions that Zara considered the easier format compared to outdoor competition (e.g., less extraneous variables, shorter distance, greater margin of error). To compound this issue, Zara felt she did not have control or was able to regulate her emotions when encountering challenging situations (i.e., recovering her form). To investigate further I administered the Shortened General Attitudes and Belief Scale (SGABS: Lindner, Kirkby, Wertheim, & Birch, 1999), in turn indicating the presence of high IBs and low RBs (Lindner et al., 1999). Upon further correspondence it became apparent that when Zara perceived low expectations from herself and others (i.e., difficult competition, a longer shooting range, competing against superior opponents) her performance thrived, whereas when the expectation to be successful was elevated (i.e., indoor competition, relatively novice opponents, and perfect conditions) her performance suffered. The following extract was taken from email correspondence where Zara commented on feelings similar to

that of “the end of the world”, after her form during a competition took an unexpected decline. Such a statement is indicative of the extreme and unhelpful beliefs commonly associated with REBT, in turn leading to unhealthy emotions and maladaptive behaviours.

“60 arrows in the morning were good and then the 60 in the afternoon were not as good. Some arrows went wayward and I even had a miss. This made me feel quite sick to my stomach because I felt I was doing the same form etc. I told another archer who said 'it's not the end of the world' but it kind of felt like that to me. I checked my equipment; it was fine so it must have been me. Other archers were puzzled and seem astonished that my arrows could be so off”

This discrepancy in performance and psychological control between outdoor and indoor competitions suggested Zara could be harbouring an irrational approach to failure and success underpinned by demands instead of asserted preferences (Dryden, 2009). Zara was experiencing a somewhat common paradox within high performance sport; the more she demanded success the harder it became for her to attain. Information collated from the needs analysis provided sufficient justification that the application of REBT would provide an appropriate intervention for Zara’s case (see Turner & Barker, 2014). To ascertain intervention effects, self-report and performance scores were collected at pre-, middle, post-intervention, and at a three and six follow-up time points (see Figure 3.1). These included measures of total irrational and rational beliefs (SGABS; Lindner et al., 1999), strength of self-efficacy beliefs and perception of control in eight performance markers, and competition performance scores. In line with single-case research, statistical analysis (i.e., paired samples t-test) was conducted to compare nine pre-intervention and nine post- onset of intervention competitive performance scores (Barker, McCarthy, Jones, & Moran, 2011). To provide social validity, a semi-structured interview was conducted with Zara at the end of the REBT program (Page & Thelwell, 2013). Questions were oriented around changes in dependent variables, the intervention process, and objective archery performance (Hrycaiko & Martin, 1996).

3.3 The Application of REBT

The central purpose of REBT is to actively challenge and dispute the client's irrational philosophy and replace it with an effective new rational alternative. REBT is proposed to be at its most effective on a one-to-one basis, over a series of sessions. The lead author was a supervised trainee Sport and Exercise Psychologist registered within the Division of Sport and Exercise Psychology (DSEP), an accredited primary practitioner in REBT, and delivered the seven one-to-one REBT sessions with Zara. Each session lasted for approximately 60 minutes and was conducted over a 3-month period. The REBT intervention was separated into education, disputation, and reinforcement phases, guided by the ABCDE model (see Figure 3.1). For an overview of applying REBT in sport see Turner and Barker (2014a).

3.3.1 Education phase. The education phase aimed to teach the client that it is their beliefs (B) that determine their emotional and behavioural consequences (C), rather than the adversity alone (A) (Dryden & Branch, 2008). Here, an emphasis was placed on ownership and control over Zara's emotional and behavioural response. Thus, irrespective of the adversity (A), Zara would gain autonomy over the functionality of her emotions and behaviours through the alteration of her beliefs (B). Before addressing the beliefs (B), Zara was asked to outline how she would like to respond (C), a response that would be helpful in the pursuit of her goal of performing well. Therefore, instead of feeling extremely anxious (dysfunctional emotion) Zara wanted to feel nervous (functional), display behaviours that were adaptive in regaining her form, and ultimately, revert back to her previous form. The following transcript examples the process involved in eliciting IBs:

Practitioner: What are you telling yourself about the situation (A), which leads you to feel and act like this (C)?

Zara: That I should be scoring higher, especially during easy indoor competitions

Practitioner: Why is it that should you be scoring higher?

Zara: Because I can shoot a lot better than I was shooting, especially during indoor shoots. I just have to shoot better than I do outdoors.

Practitioner: Would it be fair to say that because you would like to perform well when you expect to do so, that you believe you have to.

This led to establishing the irrational belief: “I would like to perform well when I compete in relatively easy competitions, therefore I must, if not it would be awful, and this would be unbearable for me”. Such a process is then repeated with other challenging situations encountered. Throughout the education phase the client’s emotional responsibility was emphasised, highlighting the B (Belief) – C (Consequence) connection, rather than the adversity (A) being solely responsible for her response (Dryden & Neenan, 2015). To reinforce Zara’s self-awareness an ABC diary was provided as an inter-session task (Ellis & Dryden, 1997). During this phase, it was important to consider factors that influenced the practitioner-client relationship that facilitated the receipt of REBT. From the outset, Zara’s expectations and goals were addressed and regularly reviewed. Throughout the intervention it was important for the practitioner to consider taking the pace of the sessions, interpersonal style (e.g., level of disclosure, humor, formality), and matching the influence base (e.g., expertise, likeability) to Zara’s preference (Dryden & Neenan, 2015). The education phase developed Zara’s self-awareness, moreover it provided the building blocks to access and dispute her core IBs, which can be difficult to access, and stubborn to change. (Neenan & Dryden, 2004). At its early conception REBT was mainly an active-directive therapy. However, contemporary advocates consider that as the REBT intervention progresses, to encourage an active and self-directed client (Dryden & Neenan, 2015).

3.3.2 Disputation phase. The disputation phase was the most critical aspect of the REBT intervention and took place over three sessions. Practitioners have typically advised that each session is 45 minutes or longer in a three-session schedule, to ensure a comprehensive disputation process (Dryden & Neenan, 2015; Turner & Barker, 2014). Disputing an individual’s belief is a challenging and sensitive process. Therefore it was important for the practitioner to manage the levels of humor (Sultanoff, 2013), as well as

including elements of practitioner self-disclosure, to help normalise Zara's position (Peterson, 2002). Adopting an ABCDE model, the practitioner rather than disputing the adversity (A), disputed (D) Zara's existing IBs (B) and strengthened her new effective (E) RBs, thus promoting healthy emotions, and adaptive behaviours (Ellis & Dryden, 1997). REBT acknowledges that the adversity (A) is assumed to be true and for the time being accept that it cannot be altered. The intervention provides an elegant solution instead of an immediate practical solution allowing the client to better manage and respond adaptively in any situation that arises, thus promoting long-term fundamental changes. To illustrate, when Zara became increasingly anxious of her 'poor' performance scores, REBT would not challenge possible misperceptions over whether it was a poor performance (A). Instead, through the promotion of her RBs (B) about that situation, REBT would facilitate a helpful emotion allowing Zara to respond in an adaptive manner. The following extract from Zara provides an example of an analogy that helped Zara to understand this process:

“We spoke of “minimising the dip”, so the recovery time is quicker and is a more helpful response, instead of having a total flip out with several more errors after those six, and it worked and you know minimise that and it works.”

From the onset of the disputation phase it was important for the practitioner to manage Zara's expectations and highlight the challenging nature of the disputation phase. To avoid confusion and ensure a comprehensive disputation process the practitioner used a directive and formulaic approach to dispute Zara's IBs, starting with the most significant: “I would like to perform well when I compete in relatively easy competitions, therefore I must, if not it would be awful and this would be unbearable for me”. This process involved three strategies based upon evidence, logic, and pragmatics (DiGiuseppe, 1991). The following transcript outlines the initial disputation process, referring to evidence, logic, and pragmatics.

Practitioner: What *evidence* is there that you have to perform to your potential when you compete in easy competitions?

Client: Well if I know I can shoot that well, I have to.

Practitioner: Where is the evidence that because you expect to do so, that you have to shoot well?

Practitioner: What do you think about the belief, because you expect to perform well that you absolutely must?

Client: Well that would make sense to me.

Practitioner: Is this *logical* that because you want something that you must have it?

Client: That is what drives me on, I have to perform well.

Practitioner: Has there ever been a time where you wanted something but was unable to attain it?

Practitioner: How *helpful* is thinking that you have to perform well?

Client: Well that should be helpful for me.

Practitioner: How helpful has this belief been for your short and long-term goals?

This disputation process was then repeated with Zara's awfulizing belief (e.g., it would be awful) and frustration intolerance belief (e.g., "this would be unbearable for me"). As exemplified, Socratic questioning was adopted, in which the practitioner asked a series of progressive and open questions that encouraged self-reflection (Dryden & Branch, 2008). As the disputation unfolded Zara verbalised her understanding and agreement of the disputation process, however, her para-verbal communication conveyed a somewhat uncertain undertone. Zara became uncomfortable and teary during one session. Indeed, it is common for clients to harbor doubts during the disputation process, so it was important for the practitioner to elicit and collaboratively address these doubts (Dryden & Neenan, 2015). Zara voiced her concerns that releasing this dogmatic demand for success would reduce her motivation towards archery; this was particularly poignant because for Zara her determination was an attribute she saw as her main strength. This is a common misconception of REBT, where clients implicitly conclude that through abandoning rigid and dogmatic beliefs this will reduce their motivation to overcome adversity and reach their intended goal, this being incorrectly associated with promoting a philosophy of indifference (Dryden & Branch, 2008). Instead, the new RBs rather than softening the importance of the adversity facilitated a constructive view of the situation helping them to achieve their goals (Turner & Barker, 2014). The meaningful replacement of Zara's demand with a very strong preference became

her turning point in the REBT program. Accordingly, a set of new and effective RBs (E) was established: “I really really really want to perform well, but that doesn’t mean I have to. If I don’t it is not the end of the world. I will feel rubbish, but I can accept that”. After two sessions of disputing and replacing her IBs with new RBs Zara was able to comprehend that losing her IBs would not reduce her motivation, instead alleviating a do or die approach, which had been hindering her performances. The following extract was taken from a follow-up interview outlining her struggle to dispute and quell her motivational concerns.

“You know sayings such as I would love to shoot to my potential but I don’t have to, that was difficult for me, to me that almost suggested that you might as well not try, but that’s not what it meant. That’s when we added an extra part to the sentence, I struggled to get my head around it, it was like climbing a mountain without the right equipment, I still have the first rational statement laminated in my case for competition”.

To reaffirm the new RBs the practitioner asked Zara to attempt to dispute the new beliefs with evidence, logic, and pragmatics. The inevitable failure to dispute the new RBs helps to reaffirm the new RBs and remove old IBs. This disputation process was then repeated again with other significant IBs. Using the ABCDE model, Zara understood that she could largely influence and determine how helpful her emotional and behavioural responses were when encountering adverse situations. To supplement the ABCDE model, REBT provides various impactful methods that can be used to dispute the client’s IBs (see Turner & Barker, 2014; Dryden & Neenan, 2015). Specifically, with Zara a ‘badness scale’ was used to challenge her awfulizing beliefs and help her gain perspective on the major and minor incidents that she encountered in her life. Zara was asked to place a numerical degree of badness of a series of example adversities onto a scale between 0-100% (Ellis, Gordon, Neenan, & Palmer, 1997). The practitioner then provided Zara with a series of sport specific adversities (e.g., missing an arrow in the final) of which she rated highly on the badness scale. Following this, Zara was provided with a series of major adversities (e.g., loss of a loved one) of which she attempted to rate highly on the badness scale. This process

eloquently highlighted for Zara that her perceptions about the severity of the situation were disproportionate with reality and a dip in performance was not “the end of the world”.

3.3.3 Reinforcement phase. The reinforcement phase is typically introduced towards the latter stage of an REBT intervention and can be completed concurrently with the first two phases. First, an important aspect of REBT is to provide homework tasks to help self-reflection and re-affirmation of its principles (Ellis & Dryden, 1997). Furthermore, cognitive, emotional, and behavioural methods were used to reinforce and internalise Zara’s rational philosophy. Cognitive methods involved working through self-help ABCDE worksheets as well as creating rational self-statements. Incorporating the influential research of Wolpe (1958) REBT utilises behavioural assignments allowing clients to actively seek and test out their newly developed rational philosophies in challenging situations (Froggat, 2005). In this case, Zara was asked to purposefully approach indoor competitions, where expectations to be successful were high. Due to the intimate overlap between behavioural, cognitive, and emotive methods (Ellis, 2004), this assignment allowed Zara to cognitively (e.g., “my performance scores dropped a bit, but it wasn’t awful”) and emotionally (e.g., “It didn’t feel like the end of the world, just annoyed”) dispute her irrational philosophy with logic, evidence, and pragmatics, as well as overcoming avoidance tendencies associated with anxiety.

As the intervention progressed it was important to gauge how Zara’s shift in beliefs impacted upon her well-being and performance (Turner & Barker, 2014). During what would be the last session together (7th), the practitioner and Zara were able to discuss and reflect upon the previous six sessions. Zara cited that “it seems ridiculous now looking back at my previous beliefs”, as well as noting she felt very positive about her archery and was enjoying it a lot more. Whilst, facilitating positive affect is not the primary objective for REBT, it encourages the client to abandon self-rating and self-esteem, in its place endorsing

Unconditional Self-Acceptance (USA; Chamberlain & Haaga, 2001). USA is defined as “the individual fully and unconditionally accepting themselves whether or not they behave intelligently, correctly, or competently, and whether or not other people approve, respect, or love them” (Ellis, 1977, p. 101). The combination of abandoning self-rating and accepting herself as a fallible human being may explain why Zara’s enjoyment of archery improved. Additionally, in-line with Self-determination Theory (SDT; Ryan & Deci, 2000) Zara’s shift from a ‘have to’ to ‘want to’ was likened to a self-determined motivation, a state manifesting in greater interest, excitement, confidence, and performance (Ryan & Deci, 2000).

REBT progressively encourages an active and self-directed client. As a result Zara was encouraged to become self-sufficient in managing her emotions and behaviours in any situation. A useful method to gauge and reassert Zara’s understanding of REBT was through ‘Rational Reverse Role-play’ (RRR; Kassinove & Digiuseppe, 1975). Here the practitioner became the client who role-played an athlete with IBs, whilst Zara acting as the practitioner actively elicited, disputed, and replaced the IBs with new effective RBs. During the seventh and final session it was evident that Zara had made substantial progress, explicitly reporting that she was increasingly able to manage challenging situations and that she no longer required routine one-to-one sessions, instead feeling independent and capable in managing from there onwards. It was then mutually agreed that no further sessions would be necessary unless Zara requested additional support. Whilst communication was maintained for a period of two months, no further REBT sessions were completed. REBT provides both a pro-active and re-active framework. In the case of Zara, REBT provided a brief therapy (Ellis, 2013), focused on dealing with and resolving Zara’s specific issues. In cases where deeper problems exist a longer program can be provided.

3.4 Structured Intervention

Using the SGABS, Zara reported meaningful short and long-term increases in her RBs and decreases in her IBs. REBT theory posits that RBs and IBs are not bi-polar constructs (e.g., high IBs does not signify low RBs; David et al., 2010b). Overlapping with the disputation phase, Zara reported increases in RBs simultaneously with decreases in IBs between sessions one to five. This long-term maintenance supports the successful application of REBT, guiding Zara from an irrational to a rational philosophy. Such a shift was reflected in the following transcript:

“I wasn’t convinced at the beginning that you could help. I followed what you said to the letter, slowly I was surprising myself, my mind-set was changing as well as improving my scores as I went along. I wasn’t as anxious when little issues arose I had those little statements which I carried which helped a lot.”

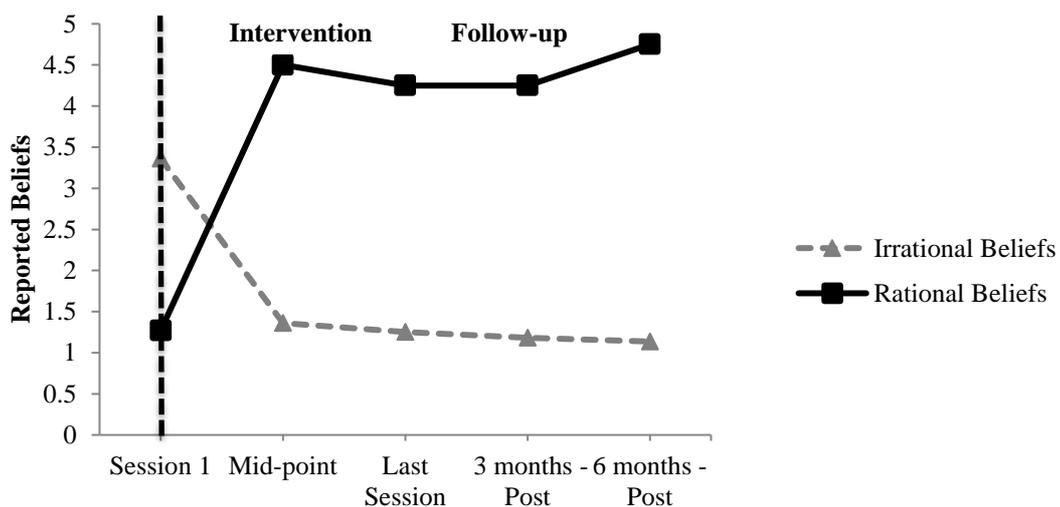


Figure 3.1 Shortened General Attitudes and Belief Scale (SGABS) scores taken at session one, mid-point, last session and at a 3 and 6-month follow up time point.

IBs are detrimental for psychological well-being, yet within elite sport some consider IBs to possess motivational qualities (Turner & Barker, 2014). To investigate this matter, analysis of social validation interview indicated that Zara’s motivation for archery had been maintained, notably highlighting she had been enjoying competition a lot more. The motivational effect of REBT can be exemplified in the following extract:

“I know I am a good archer, now I am physically fit, my style is excellent and my head is now in the right place, because of everything we have worked through, I do have a more relaxed attitude towards archery, which is benefiting my scores greatly and I can put everything negative that happens in the right perspective and minimise the gravity if you like. It helps me to recover better and I’m just more chilled, and to do a good shot you have to be relaxed; it hasn’t effected my motivation and that was a big scare that it might”.

Zara’s strength of efficacy beliefs and perception of control scores across 10 performance markers were reported on a scale between 1 (cannot do at all) and 100 (highly certain can do) on a session-by-session basis (Bandura, 2006). These markers included shot accuracy, focus, shooting consistency, shooting control, appropriate shot timing, remaining strong throughout the shot, maintaining composure, producing one continuous movement for shots, maintaining shooting position, and performing to potential. Zara reported meaningful short and long-term improvements in self-efficacy and perceptions of control across all 10 markers (see Figure 3.2). Zara’s successful adoption of a rational philosophy, (i.e., the formation of functional emotions and behaviours) led to greater emotional control and behavioural functioning. Therefore, in-line with the three-dimensional model (Cheng et al., 2009), it was postulated that Zara’s enhanced emotional control led to greater perceived control in coping and attaining goals when under stress, in turn, supporting the adaptive vs. maladaptive distinction in negative emotions as proposed by REBT theory.

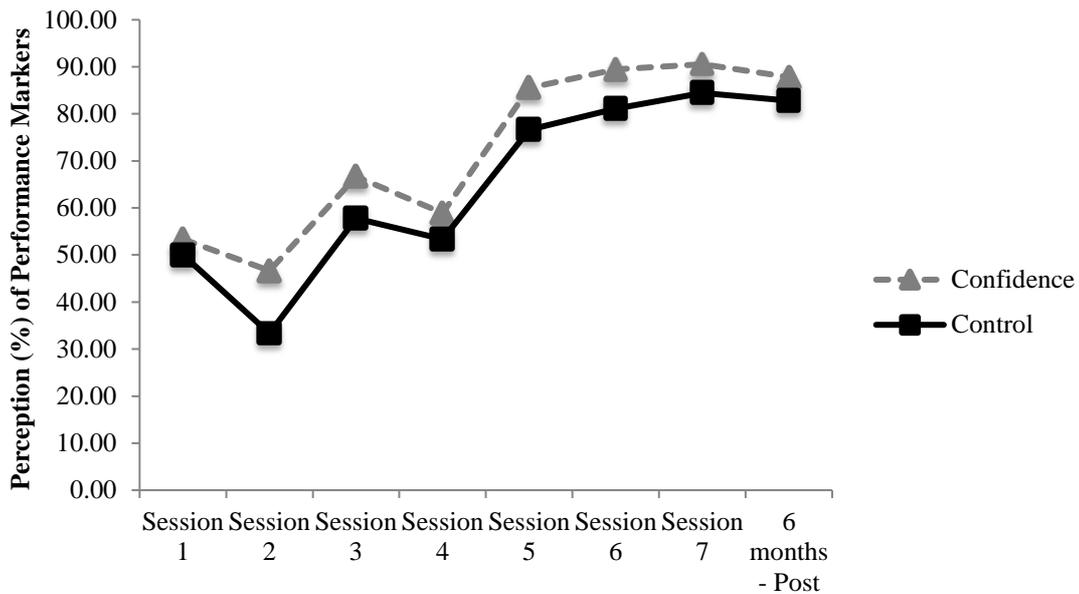


Figure 3.2 Self-efficacy and control scores for 10 archery specific performance markers taken on a session by session and at a 6-month follow up time point.

In-line with Bandura’s taxonomy, an individual’s emotional state is proposed to be a key source of self-efficacy. As a result of the REBT intervention, I hypothesised that increases in emotional control facilitated Zara’s self-efficacy beliefs towards archery performance. Accordingly, developments in both self-efficacy and perceived control were coupled with meaningful and long-term improvements in Zara’s archery performances.

Zara recoded mean increases in performance scores between nine pre-intervention competitions ($M= 75.64, SD = 8.51$) and nine post-intervention competitions ($M=84.88, SD = 5.47$; see Figure 3.3). A paired samples t -test reported large significant differences in Zara’s performance scores between pre- and post- onset of intervention phases ($t(8) = -5.196, p = <.001, d = 1.29$). We propose that such improvements in performance provided Zara with experiences of successful previous accomplishments, an important source of self-efficacy subsequently, reinforcing the reciprocal nature of Zara’s efficacy beliefs and performance scores (Bandura, 1997).

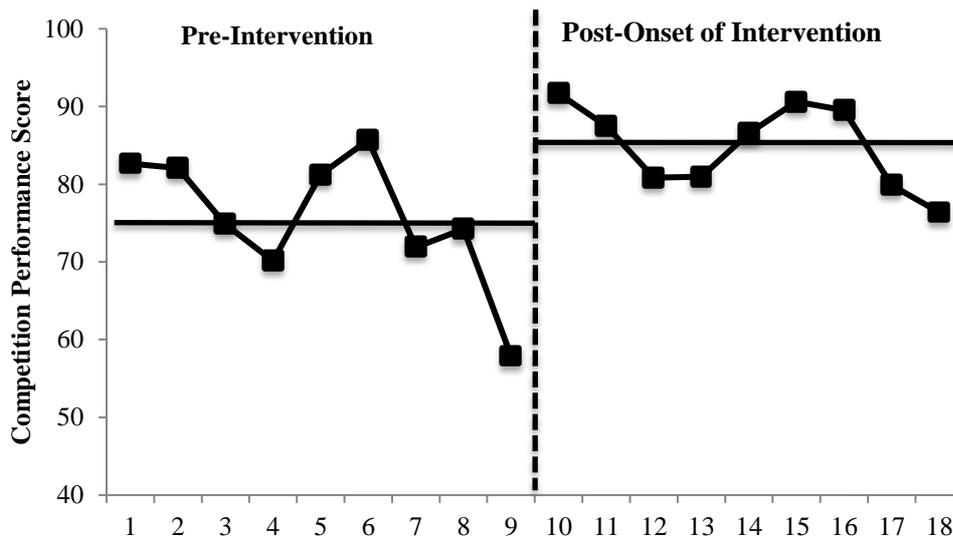


Figure 3.3 Pre- and Post- Intervention competition performance scores - calculated as percentage of maximum score attainable per competition.

The precise influence of IBs on control, self-efficacy, and athletic performance has received negligible attention within the literature. While this case provides tentative postulations, further laboratory-based research is required to understand the precise effects of REBT on performance. This case study adds to research supporting the use of REBT as an appropriate and effective approach for sport psychologists to use with athletes who present with high IBs. However, to allow for causal and more reliable conclusions to be drawn, future researchers should consider adopting applied research methods characteristic of single-case research (Barker et al., 2011). To illustrate, single-case designs ensure provision of an individualised intervention, allowing for the onset of the intervention and meaningful changes in the dependent variables to be compared against stable and representative baseline data (Hrycaiko & Martin, 1996); in turn, the precise effects of REBT would be more accurately discernable.

3.5 Considerations for Practitioners

For practitioners, the ABCDE model central to REBT is seemingly simple to comprehend and both logical and linear within its application. However, it would be

recommended for practitioners considering this approach to gain a broad theoretical and applied understanding (e.g., primary practicum in REBT) before adopting REBT within their practice. When contemplating the use of REBT practitioners are recommended to consider a sufficient timescale (5-12 sessions) when providing clients with enough time to understand, practice and re-affirm the principles of REBT (see Turner & Barker, 2014a). It is important to consider the pace and not overwhelm the client. This can be monitored through on-going collaborative reflections and reviews of the client's progress. (Grant, Townsend, Mills, & Cockx, 2009). When applying REBT the practitioner should manage misconceptions of REBT, mainly the misinterpretation that individuals should adopt a stoic approach; that is an emotionless and indifference to their predicament or the situation. REBT does not withdraw negative emotions in response to adversity, instead encourages a helpful and adaptive response. The process of reaffirming an individual new effective RB's requires long term diligence from the client, where at the beginning REBT assumes an educational approach, progressively the practitioner is encouraged to adopt a collaborative client centered approach (Dryden & Neenan, 2015). This point is illustrated in the following extract:

“I don't feel lost without you which is good, although I know that you are at the end of the telephone or email and I have my file with all my resources in. In times of doubt I go through that, and reinforce that stuff we done together. I have my little sayings, you know hesitance has ways of creeping back in so it was important to keep my mind strong...these bouts of anxiety seems so long ago, it seems like we have made such large leaps.”

3.6 Conclusion

Addressing aim one of this thesis the present case study examined the effects of a one-to-one REBT programme with an elite athlete on IBs, self-efficacy, perception of control, and athletic performance. In addition, meeting aim three of the thesis the case provided a detailed practitioner account and athletes receipt of an REBT programme. This is the first study to demonstrate REBT as an effective intervention to enhance self-efficacy, perception of control towards key performance markers, and marked increases in

athletic performance across an entire season. Furthermore, this is also the first study to evidence that such positive effects were maintained at a three and six-month time-point. In-line with previous research the present findings support the efficacy of REBT as an appropriate and effective intervention to reduce IBs in athletes using a one-to-one modality. These findings have implications for practitioners considering the use of REBT sessions as a tool to promote long lasting performance improvements. In addition, supporting REBT theory, when encountering adversity (i.e., competition) reduction in IBs and the promotion of RBs leads to adaptive behaviours that facilitate goal achievement (e.g., enhanced performance scores).

This chapter offers an idiographic and detailed examination into the performance enhancing effects of an intervention still within its infancy. Ultimately, valuable insights into the effects on important psychological and performance outcomes, as well the associations between IBs and/or RBs on key psychological constructs (e.g., motivation, anxiety) have been garnered. Whilst allowing for an in-depth assessment into a single participant the use of a case-study did not provide conclusive empirical evidence regarding the intervention effectiveness (e.g., reliance on self-report measures, no control group, and maturation effects). A case-study lacks methodological rigor, in that the process is largely dictated by the researcher (Maoz, 2002). This absence of systematic procedures compounds to threat to internal validity, whereby confidence that the changes in the dependent variables (i.e., IBs, self-efficacy, perception of control, & performance) are a direct result of the REBT intervention are reduced in comparison to more rigorous research designs. Not restricted to validity, the fluidity of single-case design also compromises the reliability/replicability and the generalizability of the study findings. To continue the examination into the applied effects of REBT and overcome methodological shortcomings in this Chapter, Chapter 4 examined the effects of REBT on psychological, physiological, and performance outcomes in elite

disabled athletes using a systematic and rigorous applied methodology (i.e., single-case research design; Barker et al., 2011). Furthermore, meeting thesis aim three, a single-case research design was used to refine and mould the delivery of REBT (Barker et al., 2013), gleaning valuable professional practice insights.

Chapter 4

Examining the Effects of Rational Emotive Behaviour Therapy (REBT) on Performance Outcomes in Elite Paralympic Athletes.

4.1 Introduction

In Chapter three, the data highlighted the potentially valuable effects of REBT as an intervention that not only enhances psychological health, but also brings about immediate and maintained increases in important psychological outcomes (i.e., self-efficacy and perception of control) and objective markers of athletic performance. In-line with aims one and two of the thesis Chapter four builds on Chapter three in a number of ways. 1) The immediate and maintained effects of a one-to-one REBT programme are examined using a single-case multiple-baseline across-participants design (Barker et al., 2011). 2) The effects of REBT are measured across a range of self-report and objective markers (e.g., IBs, trait anxiety, achievement orientation, physiological markers (i.e., blood pressure), and competition simulation performance scores. 3) Finally, the effects of REBT were examined with a specialized sample (i.e., Paralympic athletes) - a unique and underrepresented population within the professional practice literature.

Although not originally associated with performance settings, REBT presents a model of optimal human functioning (Ellis et al., 2010), offering a pro-active intervention to enhance psychological health and one that may facilitate athletic performance (Turner, 2016). Accordingly, emerging research has examined the effects of REBT on performance using group-based workshops and one-to-one modalities with elite athletes. Findings have evidenced reductions in IBs, facilitative shifts in an athlete's interpretation of anxiety, as well as reporting both psychological and performance benefits as a result of an REBT intervention (e.g., Lerner et al., 2007; Turner et al., 2013; Turner & Barker, 2013). The effects of REBT on performance appear to be promising, marking a shift in a new wave of psychological techniques being used by sport psychologists. However, complete conclusions regarding the

effects of REBT on athletic performance are difficult to ascertain due to a lack of critical mass and methodological shortcomings within the literature. For example, research has largely favoured subjective rather than objective measures to ascertain the effects on emotion, behaviour, and performance (e.g., Turner & Barker, 2013; Turner et al., 2013), as well REBT has been integrated within multi-modal packages (e.g., Elko & Ostrow, 1991) making the precise effects difficult to ascertain. Overcoming previous limitations and line with thesis aims one and two, the primary aim of the current study was to investigate the effects of five one-to-one REBT sessions on psychological, physiological, and athletic performance (i.e., behavioural consequences) outcomes in elite athletes with a disability.

Whilst, researchers have alluded to the possibility that IBs harbour motivational qualities (e.g., Turner & Barker, 2014), research has also proposed (e.g., Turner, 2016) and reported shifts in motivational quality (i.e., increased enjoyment of the sport) rather than intensity after receiving REBT (Chapter three). Achievement goals are proposed to signify an athletes motivation for participating in sport (Jones et al., 2009), whereby approach goals are associated with positive achievement-related processes and outcomes, whereas avoidance goals are associated with negative achievement-related processes, self-handicapping, and state anxiety (e.g., Nien & Duda, 2008). Thus, the present study investigated the effects of REBT on approach and avoidance goals to further elucidate any potential effects of REBT on an athletes' motivation.

Literature also indicates that rational beliefs are positively related to biological indicators of health, whereas IBs are associated with biological indicators of ill-health (i.e., disease related physiological responses; David & Cramer, 2010). To illustrate in a study of 853 healthy adults reported positive associations between IBs and C-reactive protein, interleukin-6 tumor necrosis factor, and white blood cell counts, thus suggesting IBs are a risk factor for cardiovascular diseases (Papageorgiou et al., 2006). In addition, Harris et al.

(2006) reported that participants who were asked to hold an irrational belief during a real life stressful scenario resulted in greater increases in Systolic Blood Pressure (SBP) whereas a rational manipulation resulted in decreases in SBP. Hence, researchers have suggested 'mental rigidity' (high IBs) to be associated with 'autonomic rigidity' (high SBP). In support, researchers have reported those with Type A coronary behaviours to be associated with higher IBs (Smith & Brehm, 1981) and elevated risk of cardiovascular disease. In sum, moving previous research the use physiological markers (e.g., systolic blood pressure) offer an objective and valuable marker to test the postulations of REBT, that IBs lead to a maladaptive physiological state, whereas RBs are associated with adaptive physiological response (David et al., 2010).

Despite widespread intervention research there exists a paucity (e.g., Arnold et al., 2016; Bawden, 2005; Blumenstien & Orbach, 2015) of literature that examines the effects of sport psychology interventions within specialized populations, such as elite athletes with a physical disability (Barker et al., 2013). Previous research indicates athletes with a physical disability encounter numerous demands similar to able-bodied athletes (Arnold et al., 2016), nevertheless there also exists physical and psychological challenges specific to their condition which must be taken into consideration (e.g., lack of autonomy, potential injury, medical care, insufficient qualified supervision, and negative social reactions from the community; Jaarsma et al., 2014). Therefore, in-line with aims three of the thesis a secondary purpose of the present study was to provide an idiosyncratic and comprehensive investigation into the effects of a one-to-one REBT program with elite Paralympic athletes using a single-case research design within ecologically valid setting (SCD; Barker et al., 2013).

In sum, REBT promotes psychological health and offers a model of optimal human functioning. Research suggests REBT may help athletic performance, however the findings remain equivocal and difficult to ascertain due to lack in critical mass of research, as well as

an overreliance on subjective rather than objective markers of performance. In-line with thesis aims one and three, the primary purpose of Chapter four was to examine the immediate and maintained effects of a one-to-one REBT programme on physiological, psychological, and performance outcomes with elite Paralympic athletes using a single-case research design. Additionally, this was one of the first controlled studies using a psychological intervention (REBT) with Paralympic athletes. It was hypothesised that the REBT programme would bring about immediate and maintained reductions in IBs, that would be aligned with reductions in trait anxiety, avoidance goals, baseline measures of systolic blood pressure (indicative of an adaptive physiological response), as well as increases in athletic performance during competition simulations.

4.2 Method

4.2.1 Participants. Eight elite athletes aged between 18 and 57 ($M = 40.12$, $SD = 12.99$) years, with experience on the Paralympic program ranging over 1 month to 17 years ($M = 6.56$, $SD = 7.08$) were purposively recruited from the same sport (the sporting organisation wished to retain anonymity). Participants 1, 3, 4, 5, 6 were male and participants 2, 7 and 8 were female. Pre-screening procedures confirmed all participants had no previous experience or understanding of REBT. Considering all humans harbor a biological predisposition towards IBs all athletes were included in the study (Ellis et al., 2010). Consent was provided by all participants and ethics approval gained through the university's Research Ethics Committee (see Appendix 3.1).

4.2.2 Design. In-line with the best practice in single-case designs (Barker et al., 2011) a staggered multiple-baseline across participants design offering an experimental and ideographic platform to observe intervention effects in ecologically valid settings was used. Meaningful changes in participants' state IBs were compared against stable and representative baseline data collected prior to the beginning of the intervention phase

(Hrycaiko & Martin, 1996). The sequential delivery of one-to-one REBT sessions using a multiple baseline design allowed the effects of the intervention to be ascertained by comparing changes in IBs from the onset of the intervention to those prior to intervention delivery, whilst controlling for extraneous variables (Barker et al., 2011). Remaining outcome variables (i.e., psychological, physiological, and performance scores) were collected from all participants at a pre-intervention, post-intervention, and 9-month follow-up time point.

4.2.3 Measures.

4.2.3.1 Irrational beliefs. The Shortened General Attitudes and Beliefs Scale (SGABS; Lindner et al., 1999) was used as a measure of total state and trait IBs. In-line with previous research all four items from the rational belief subscale were removed due to its failure to provide a reliable and sensitive measure of rational beliefs, reducing the SGABS from 26 to 22 items (e.g., Turner & Barker, 2013). The SGABS has good test-retest ($r = .91$; Lindner et al., 1999), construct, criterion, discriminant, convergent and concurrent reliability (MacInnes, 2003). Using a survey link generated by Qualtrics Software (Copyright © 2015) measures of total IBs were collected on the same day, on a weekly basis across pre-intervention and post-intervention phases over 22 weeks. Trait measures of IBs were also collected at 9-month follow-up time-point. The measure consisted of 22 items, forming six subscales of self-downing, other-downing, need for achievement, need for approval, need for comfort, and demand for fairness. Total irrational belief scores were calculated as a mean across all six subscales. Higher scores indicated stronger IBs. Responses were made on a 5-point Likert-scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach's alpha coefficients for total trait and state irrational belief scores indicated internal reliability scores ranging from $\alpha = .71$ to $\alpha = .88$.

4.2.3.2 Trait anxiety. Participants' trait anxiety (Ax) was measured using 10 items with the best psychometric properties from the trait Ax subscale of the State Trait Personality Inventory (STPI; Spielberger & Reheiser, 2009). The 10 trait anxiety items within the STPI has a high test-retest reliability ($r = .76 - .86$), Cronbach's alpha coefficient ($\alpha = .90$), content, construct and concurrent validity (Spielberger & Reheiser, 2009). Total trait anxiety scores were calculated as a mean across all 10 items, whereby higher scores indicate higher trait anxiety. Participants recorded their answers on a 4-point Likert-scale ranging from 1 (*not at all*) to 4 (*very much so*). Cronbach's alpha coefficients for trait anxiety scores indicated internal reliability of $\alpha = .84$, $\alpha = .79$, and $\alpha = .86$ at a pre-intervention, post-intervention, and 9-month follow-up time point respectively.

4.2.3.3 Achievement goals. The Achievement Goal Questionnaire (AGQ; Conroy et al., 2003) was used to assess the participants Mastery Approach (MAp) Mastery Avoidance (MAv), Performance Approach (PAp) and Performance Avoidance (PAv) Goals in relation to the upcoming competitive simulation. The AGQ has reported Cronbach's alpha coefficient for MAp ($\alpha = .87$), MAv ($\alpha = .89$), PAp ($\alpha = .92$) and PAv ($\alpha = .83$). Scores from this measure also report strong structural invariance, temporal stability, and external validity (Conroy, Metzler, & Hofer, 2003). To reduce the questionnaire completion time during data collection and similarly to previous research 12 items from the AGQ were reduced to four items (e.g., Turner et al., 2013). Total approach and avoidance scores were calculated as a mean of MAp and PAp, and MAv and PAv items respectively. Participants reported their answers on a 7-point Likert-scale ranging from 1 (*not at all true*) to 7 (*very true*). Higher scores indicate stronger approach or avoidance orientations.

4.2.3.4 Performance. To assess performance participants took part in a competitive shooting simulation mimicking the format of a major championship. Performance scores were calculated as mean scores over the course of the simulation.

4.2.3.5 Physiological markers. The Finometer PRO (Finapres Medical Systems, Netherlands) was used to collect resting physiological measures prior to the upcoming competitive simulations. Previous research has validated the Finometer PRO as an apparatus to measure cardiovascular indices (e.g., Kalkoft et al., 2010; Schutte et al., 2004). Preceding the data collection process participants were notified of the upcoming simulation, then Heart Rate (HR), Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) were monitored over a five-minute period; mean scores were calculated.

4.2.3.6 Social validation. As recommended by Page and Thelwell (2013) social validation data was collected using using a semi – structured interview ($M = 14\text{mins } 36$ seconds) and conducted with each participant and significant others (i.e., head coach and lead sport psychologist). The interview guide consisted of a series of open questions and probes, gleaning insights into the usefulness, importance, and impact of the intervention on the participants' thoughts and behaviors (Turner & Barker, 2014). Specifically, questions targeted three key criteria of social validation put forth by Wolf (1978): 1) social significance of the goal(s), 2) social appropriateness of the procedures, and 3) social importance of the effects. Adopting coding procedures from Miles and Huberman (1984) the interviews were transcribed verbatim, resulting in 22 pages of single spaced raw text data. Pseudonyms were applied to avoid both organisational and personal identification. In line with recent qualitative studies the data was subjected to both inductive and deductive content analysis to make sure raw data was placed into suitable higher-order themes (Thelwell, Weston, & Greenless, 2007). Qualitative content analysis was used to code and identify themes through a systematic classification process (Hsieh & Shannon, 2005). The data analysis started out with a-priori themes focussed on the three key criteria of social validation. Further, in line with procedures set out by Scanlan et al. (1991) content analysis was conducted to

inductively elicit the emergence of themes. The transcripts were analysed for raw data themes, grouped into lower-order themes, and categorised into general dimensions.

4.2.4 Data collection. To ensure participants were accustomed and desensitized to the research protocol (e.g., white coat syndrome; Parati et al., 2003) participants were first provided with a 30-minute introduction session to the research project, and then completed a trial run of the research protocol (i.e., self-report, physiological and performance measures). Using the SGABS participants' IBs were monitored and completed on a weekly basis from at least five weeks prior to beginning the REBT intervention, to five weeks after completing the intervention. Based upon a multiple-baseline across participants design the REBT intervention was delivered to participants 1 and 2 after reporting five weeks of stable baseline measures. Participants 3 and 4 then began the REBT intervention at week 7. Following this, participants 5, 6, and 7 started the intervention at week 8, and participant 8 on week 9.

Pre-intervention measures were collected from all participants at week 5 prior to the start of the REBT intervention and post-intervention measures were collected the week after the final participant had completed the intervention program (week 18). To explore the maintenance effects of the REBT intervention identical measures were collected at a 9-month follow-up. Data collected at pre-, post-intervention, and 9-month follow-up were completed over the duration of a day whereby first, each participant was allocated a time slot to complete a series of self-report measures (i.e., trait IBs, trait anxiety). Following this resting HR, SBP, and DBP measures were collected, and then participants were asked to report their achievement orientation prior to taking part in the competitive simulation.

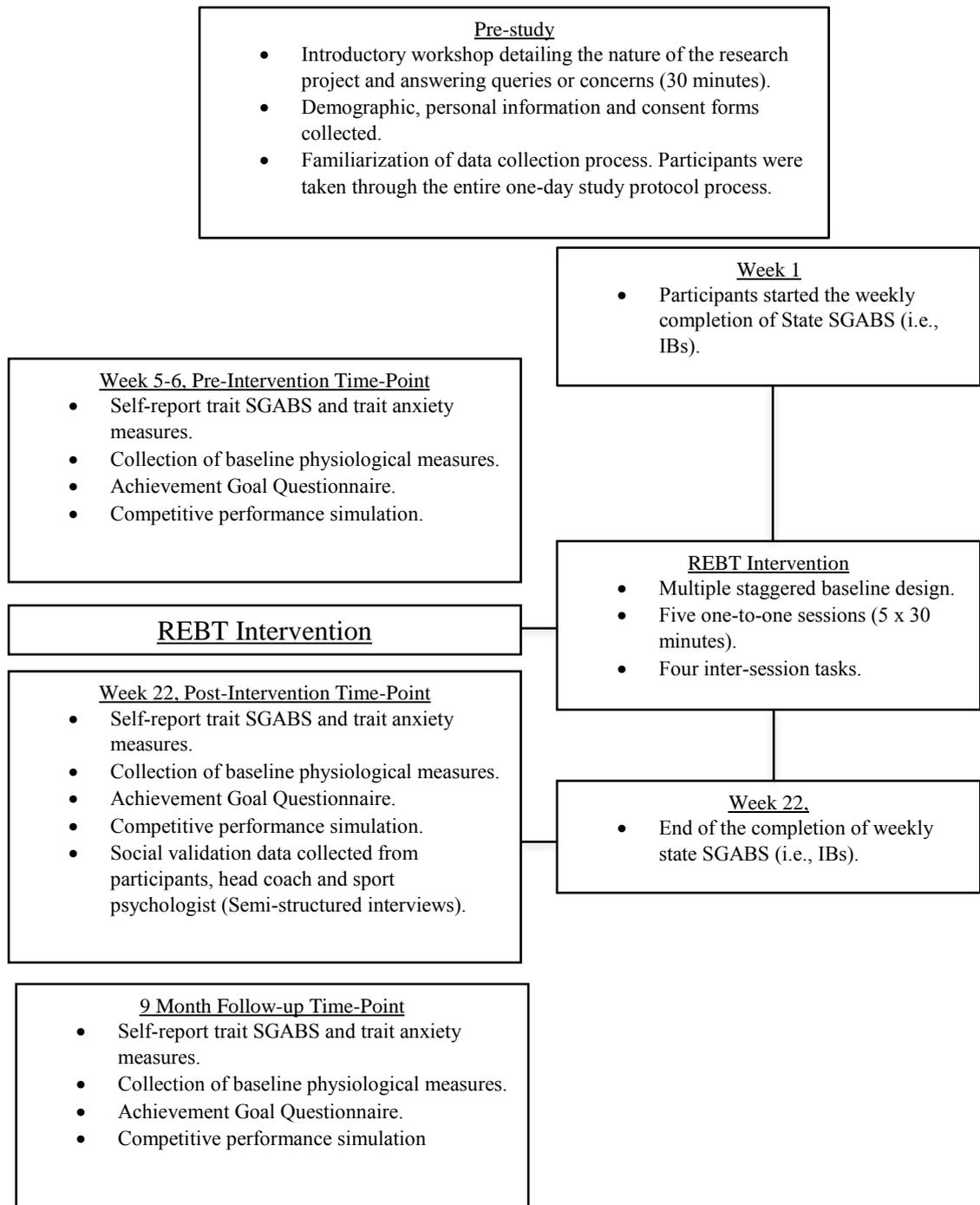


Figure 4.1 Diagrammatic representations of data collection process.

4.2.4.1 Intervention. The intervention was delivered by the lead author who was a supervised trainee Sport and Exercise Psychologist registered within the Division of Sport and Exercise Psychology (DSEP) and an accredited primary practitioner in REBT. Participants received a REBT intervention program consisting of five one-to-one sessions each lasting for 30 minutes, as well as four inter-session homework tasks on a weekly or

fortnightly basis. One and two week intervals were considered sufficient to maintain momentum, whilst allowing enough time for participants to take responsibility in the self-change process (Dryden & Neenan, 2015). The intervention was separated into education, disputation, and reinforcement phases guided by the ABCDE model (see Figure 4.1). For an overview of applying REBT in sport see Turner and Barker (2014). Participant 6 completed three of the five intended sessions due to availability.

4.2.5 Data analysis. Due to injury (participant 7 and 8) and technical reasons (participant 5) no quantitative data were collected for participant 7 and no performance scores were collected for participant 5 and 8 at the 9-month follow-up time point.

4.2.5.1 Visual analysis. A combination of visual and graphical analysis was used to investigate intervention effects on participants' IBs as is typical in SCD research (Barker et al., 2013). Intervention effects were inferred when at least two of the following criteria were met: (a) the last few data points of the baseline were stable, or in the opposite direction to the predicted effects of the intervention; b) there were a minimal number of overlapping data points between baseline and treatment phases, c) there was an immediate effect following the intervention and d) there was a larger effect size in comparison to the baseline (Hrycaiko & Martin, 1996). Participants' IBs were visually inspected using graphical and descriptive statistics.

4.2.5.2 Statistical analysis. Statistical analysis was used to compliment visual inspection of the irrational belief data (Barker et al., 2011). Descriptive statistics, percentage change scores, immediate change scores and Non-Overlapping Data-points (NDP) were calculated between pre-intervention and post-intervention phases (see Table 4.1). The percentage of non-overlapping data points was calculated from the treatment data that overlapped with the most extreme baseline data point (Morgan & Morgan, 2009). To conduct statistical analysis and ensure the data met parametric assumptions, participants' total

irrational belief scores were assessed for serial dependency via auto-correlational analysis (Ottenbacher, 1986). Scores were assessed between pre-intervention (onset of baseline to start of intervention) and post-intervention (intervention onset –five weeks post intervention conclusion) phases. Initially, both pre- and post-intervention scores for participants 1 and 2 were collapsed and analyzed together as there were fewer than 6 baseline data points. Subsequent analysis revealed non-significant autocorrelations between all but Participant 2's SGABS scores ($r=0.86$). To negate violating the assumption of serial dependence a first difference data transformation was conducted, subsequently reporting a non-auto correlated data and permitted statistical analysis, whilst retaining original scores for visual analysis (see Figure 4.2). To determine the magnitude of the intervention effect Cohen's d was calculated between pre-intervention and post-intervention phases (Cohen, 1992):

$$\text{Cohens } d = (M_2 - M_1) / SD_{\text{pooled}}$$

Single case data was interpreted in reference to small effect size $> .20$; medium effect size $> .50$ and large effect size $> .80$ (Cohen, 1992). Typical to SCD, changes in total irrational belief scores between pre- and post-intervention phases were analyzed using an independent samples t -test for each participant. Two non-parametric correlations (Spearman's rho) were also used to examine the associations between IBs and physiological markers (1. pre-intervention and post-intervention; 2. pre-intervention and 9-month follow-up time point). Statistical significance was set at $p < .05$.

4.2.5.3 Procedural reliability. To ensure the intervention was a) delivered in a consistent manner, b) received well, and c) participants enacted on the intervention, a session-by-session REBT booklet guided by the ABC (DE) model was created (see Figure 3.1; available from the first author). Aligned with REBT practice guidelines (see Dryden & Branch, 2008; DiGiuseppe et al., 2013) a list of pre-determined procedural checklists were compiled by the research team (i.e., session structure, session content, time-spent on each

section, key outcomes). At the end of each session participants were encouraged to reflect and verbalize their comprehension of the session content and provided with a homework task. At start of each session a review of the previous session/s and homework completion was conducted to clarify participants' understanding, as well influence the content of the current session (Dryden & Branch, 2008). To minimize drifts in intervention delivery and assess procedural reliability the lead author engaged in personal reflections and peer supervision with the research team over the course of the intervention. To control for co-intervention bias the team sport psychologist provided no support/mention of topics related to beliefs or REBT theory.

4.3 Results

The results of this study are presented in two sections. First, we detail and summarise the effects of the intervention on the participants across all outcome variables. Second, social validation data reports the participants, head coach and sport psychologists' perceptions and thoughts about the intervention.

4.3.1 Irrational beliefs. Six participants (P 2, 3, 4, 5, 7, 8) reported substantial mean reductions in IBs between pre-intervention and post-intervention phases, constituting one medium, and five large effect sizes (see Table 4.1). Notably, the REBT intervention brought about maintained reductions in IBs for five (P, 2, 3, 4, 5, 8) out of a possible seven participants between the pre-intervention phase and at a 9-month follow-up. Participant 1 recorded a statistically significant increase in IBs after the onset of the REBT intervention, which plateaued for the remainder of post-intervention phase (see Figure 4.2). Participant 6 who received only three of the five intended REBT sessions reported no significant changes in IBs between pre- and post-intervention phases. No participants reported an immediate change in IBs at the onset of the intervention, indicating a delayed intervention effect. In sum, data suggests that the REBT intervention brought about both short and long-term

reductions in IBs. However, data for participant 5 and 7 exhibited both a downward trend in state IBs and strong floor effects prior to the onset of the intervention and therefore should be interpreted with caution.

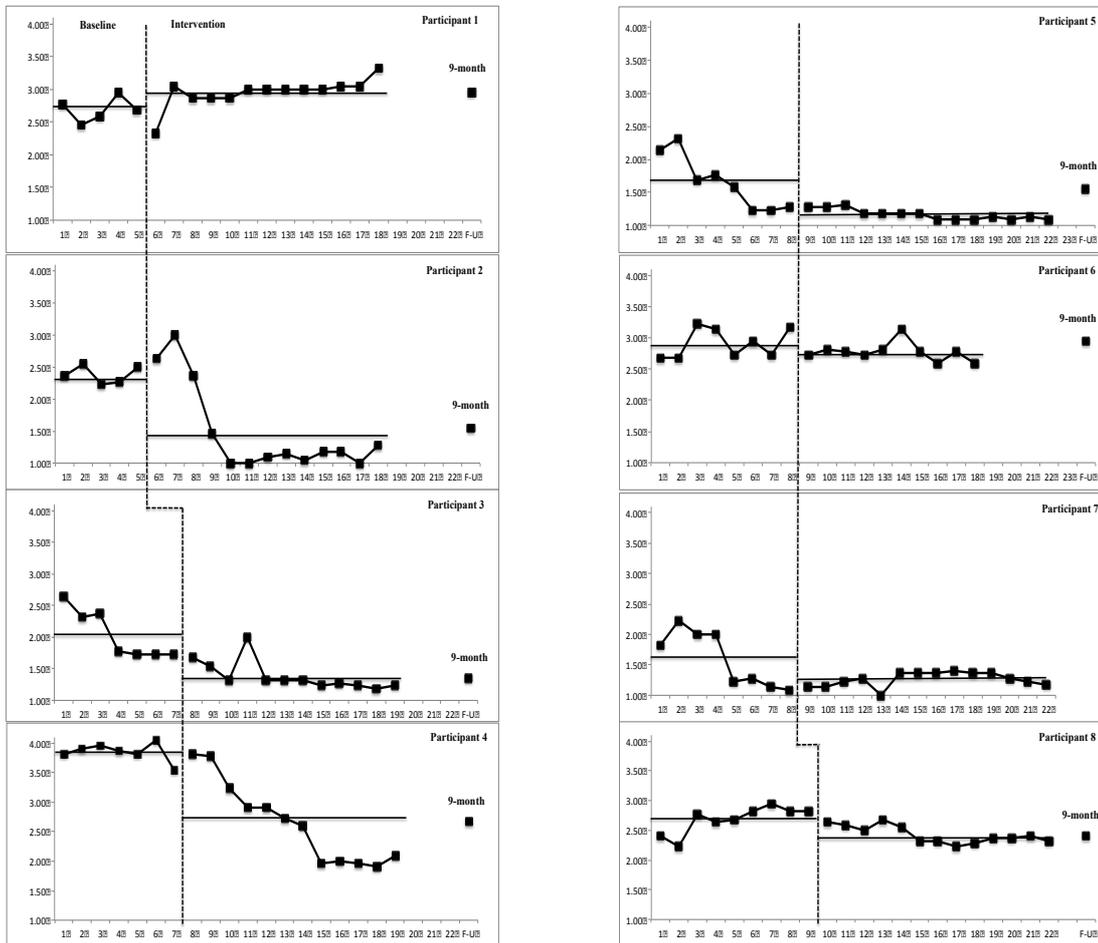


Figure 4.2 Graph showing total irrational beliefs collected across pre-intervention, post-intervention phases and at a 9-month follow-up time-point.

Table 4.1

Mean values, standard deviations, percentage change scores, immediate change, non-overlapping data points and effect sizes of state irrational beliefs scores from pre- to post- intervention phases. As well, trait irrational beliefs and percentage changes scores between a 9-month follow-up time point and post-intervention phases.

Participant	State Irrational Beliefs					Follow-up Trait Irrational Beliefs		
	Pre	Post	Change Scores (%)	Immediate Change	Non-overlapping Data Points (%)	Effect Size	Follow-up (trait)	Change Scores (%)
1	2.69 ± .19	2.95 ± .22*	9.67	No	92.31	1.26	2.95	9.67
2	2.38 ± .14	1.49 ± .70*	-37.39	No	76.92	1.76	1.55	4.03
3	2.04 ± .39	1.39 ± .24**	-31.86	No	91.67	2.01	1.36	-2.16
4	3.85 ± .16	2.66 ± .70**	-30.91	No	83.33	2.34	2.68	-0.75
5	1.65 ± .41	1.17 ± .08**	-29.09	No	78.57	.76	1.55	32.47
6	2.92 ± .24	2.77 ± .15	-4.81	No	22.22	.75	2.95	6.50
7	1.60 ± .46	1.26 ± .12*	-21.25	No	7.14	1.01	N/A	N/A
8	2.67 ± .24	2.46 ± .18*	-9.33	No	7.69	.99	2.41	-2.03

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

4.3.2 Trait anxiety. Three of the five participants (P 2, 4, 5) who reported reductions in IBs also reported reductions in trait anxiety between pre-intervention and 9 month-follow-up (see Table 4.2). Participant 1 who reported significant increases in IBs recorded increases in trait anxiety scores between both pre- and post-intervention, and at a 9-month follow-up time point. Considering this, only one of the six participants (P 2) who reported significant reductions in IBs reported substantial reductions in trait anxiety between pre- and post-intervention, therefore conclusions about the effects of REBT on participants' trait anxiety are difficult to draw (see Table 4.2).

4.3.3 Physiological measures. Three of the eight (P 2, 4, 6) participants reported reductions in mean resting SBP scores between pre- and post-intervention time points, whereas all seven participants with relevant data reported a reduction in mean resting SBP between a pre-intervention and 9-month follow-up time point. Five out of six participants (P 2, 3, 4, 5, 8) who reported significant reductions in IBs between pre- and post-intervention phases also reported reductions in mean resting SBP between pre-intervention and 9-month follow-up time points (see Table 4.3). Spearman rho indicated a non-significant but moderate positive correlation between reductions in IBs and SBP from pre-intervention to 9-month follow-up ($r_s(7) = .57, p = .18$); 44% of the variance in change SBP scores was accounted for by the change scores in IBs. In contrast, there was no correlation in changes in IBs and SBP from pre-intervention to post-intervention ($r_s(8) = -.07, p = .86$) time points. Furthermore, data suggests the intervention brought about reductions in resting blood pressure for participants who initially reported high levels and significant reductions in IBs. To illustrate, participants 2 and 4 indicated staggered reductions in SBP and DBP across all three-time points. Data suggests that reductions in IBs may have a lagged effect on the mean resting SBP of the participants approaching a competition simulation.

4.3.4 Performance scores. Five of seven participants (P 2, 3, 4, 6, 7) recorded improvements in competitive simulation performance from pre- to post-intervention (see Table 4.2). Four of five participants who reported significant reductions in mean IBs from pre- to post-intervention phases (P 2, 3, 4, 8) also recorded improvements in performance scores from pre- to post-intervention. Four of six participants (P 2, 4, 5, 6) reported performance increases between pre-intervention and 9-month follow-up. In sum, the data indicated reductions in IBs brought about by the REBT intervention were paralleled with increases in the participants' performance scores between pre-, post-intervention, and 9-month follow-up time points. Considering the variations in the magnitude of change in each participant's performance scores, such conclusions are drawn tentatively; in addition, participant 1 exhibited strong ceiling effects in performance scores across all time points.

4.3.5 Achievement goals. All six participants who reported significant reductions in mean IBs from pre- to post-intervention (P 2, 3, 4, 5, 7, 8) also reported small reductions in approach goals (see Table 4.2). Furthermore, five of these six participants (P 3, 4, 5, 7, 8) also reported reductions in avoidance goals from pre- to post-intervention. All participants reported a maintained (P 3, 6) or an increase (P 1, 2, 4, 5, 8) in approach goals from post-intervention to 9-month follow-up; whereas, four of seven participants reported a maintained (P 2) or reduction (P 1, 4, 5, 8) in avoidance goals. These data suggest the REBT intervention may have brought about reductions in approach goals and greater and sustained reductions in avoidance goals.

Table 4.2

Mean values for trait anxiety, approach goals, avoidance goals, and competition simulation performance scores collected at each time-point.

Participant	Trait Anxiety			Approach Goals			Avoidance Goals			Simulation Performance Scores		
	<i>Pre</i>	<i>Post</i>	<i>Follow-up</i>	<i>Pre</i>	<i>Post</i>	<i>Follow-up</i>	<i>Pre</i>	<i>Post</i>	<i>Follow-up</i>	<i>Pre</i>	<i>Post</i>	<i>Follow-up</i>
1	16	18	25	4.5	2.5	5.5	3.5	1	4	28.45	28.30	28.02
2	17	13	14	4.5	3	5	2	2	2	14.85	22.50	22.39
3	11	10	12	5	4	4	5	1.5	3	23.90	27.06	N/A
4	23	23	20	5.5	4	6	5	4.5	6	22.88	23.80	23.75
5	18	16	17	4	2	4	3.5	2	2.5	25.27	23.75	25.50
6	28	25	21	5.5	5	5	4	3.5	2.5	24.25	24.69	25.15
7	18	18	N/A	5.5	5	N/A	3	3	N/A	22.60	24.75	N/A
8	16	17	16	6	5	6	5	4.5	4	25.20	N/A	23.90

Table 4.3

Mean values and standard deviations for resting heart rate, diastolic blood pressure, and systolic blood pressures prior to competition simulations, collected at each time-point

Participant	Heart Rate			Systolic Blood Pressure			Diastolic Blood Pressure		
	<i>Pre</i>	<i>Post</i>	<i>Follow-up</i>	<i>Pre</i>	<i>Post</i>	<i>Follow-up</i>	<i>Pre</i>	<i>Post</i>	<i>Follow-up</i>
1	90.67±3.58	92.69±2.54	89.15±3.60	152.04±6.58	157.96±7.11	147.89±6.17	89.00±3.65	92.91±3.76	93.49±3.42
2	78.86±2.43	70.77±2.49	77.96±2.59	141.24±4.43	134.51±3.88	125.51±4.54	86.56±2.74	83.25±2.55	79.31±2.91
3	83.03±2.91	85.99±3.32	91.59±2.29	152.03±6.92	158.14±10.18	141.33±8.66	91.43±3.86	99.52±5.09	99.23±3.09
4	73.80±3.77	61.26±3.47	70.96±5.37	163.70±11.95	150.69±7.27	132.66±6.77	99.42±8.62	94.88±4.06	82.91±3.92
5	83.39±1.52	75.35±1.58	89.60±1.78	97.89±3.39	105.33±2.73	97.22±3.20	60.80±1.42	67.16±1.54	66.16±1.74
6	88.21±3.21	82.44±3.77	82.58±4.81	151.86±24.61	133.41±1.76	140.85±7.02	93.45±11.52	93.93±1.19	89.83±4.26
7	81.48±5.06	77.02±4.26	N/A	133.26±5.73	139.18±6.00	N/A	74.94±3.39	85.33±4.95	N/A
8	65.20±4.35	91.73±4.18	76.70±4.03	139.36±5.62	143.01±6.17	135.01±4.54	79.17±4.21	84.85±3.83	82.07±3.10

4.3.6 Social validation. Data analysis revealed 40 raw data themes, eight lower-order themes, and three general dimensions of: intervention recipient (i.e., athlete), head coach, and the lead sport psychologist (see Figure 4.3). The data analysis process exploring the effects of REBT on the participants reported six lower order themes of: Performance Effects, Self-regulation, REBT program, Interpersonal Level, Change in Philosophy, and Caveats. To illustrate participants noted “I feel these sessions have been incredibly helpful and I have gained tools that I will use for the rest of my life” (i.e., change in philosophy). As well, highlighting performance benefits stating “During comp, I just ignore the nonsense around me, even deliberate distractions, just laughing them off in my head” (i.e., self-regulation). Performance benefits as a result of enhanced competition focus were also cited frequently by participants. For example one noted: “It has allowed me to focus on my performance without wasting my mental energy”. All parties reported the REBT intervention developed interpersonal relations within the team through the use of rational language and rational phraseology. For example, one participant stated “I don’t put other people in boxes anymore and place a big X next to them”, thus indicating a rational shift from ‘other-downing’ towards ‘unconditional other-acceptance’. Participants also fed-back on changes they would make to the program, highlighting the want for longer and a greater number of sessions. For example, a participants noted: “If sessions can be bunched up and longer, that would be better, so I can reinforce and practice what we have learned”.

Data analysis also indicated that the head coach found it difficult to observe changes in the athletes whilst highlighting a visible change in how athletes thought about situations. The head coach also noted good engagement with the REBT intervention, and that the inclusion of coaches within the REBT program would help to reinforce the athlete’s development, implicitly alluding to fostering a rational environment. The sport psychologist cited similar themes to the athletes, as well observing no changes in participants’ motivation

as a result of the intervention. The participants were reported to have engaged and been receptive to the intervention that was facilitated by the content, style of delivery and establishing trust with the practitioner. In addition, the sport psychologist offered considerations into the application of REBT with this particular sample; specifically highlighting the complexity of these individuals, and that for some, longer and a greater number of sessions were required to bring about more meaningful and fundamental changes in their beliefs.

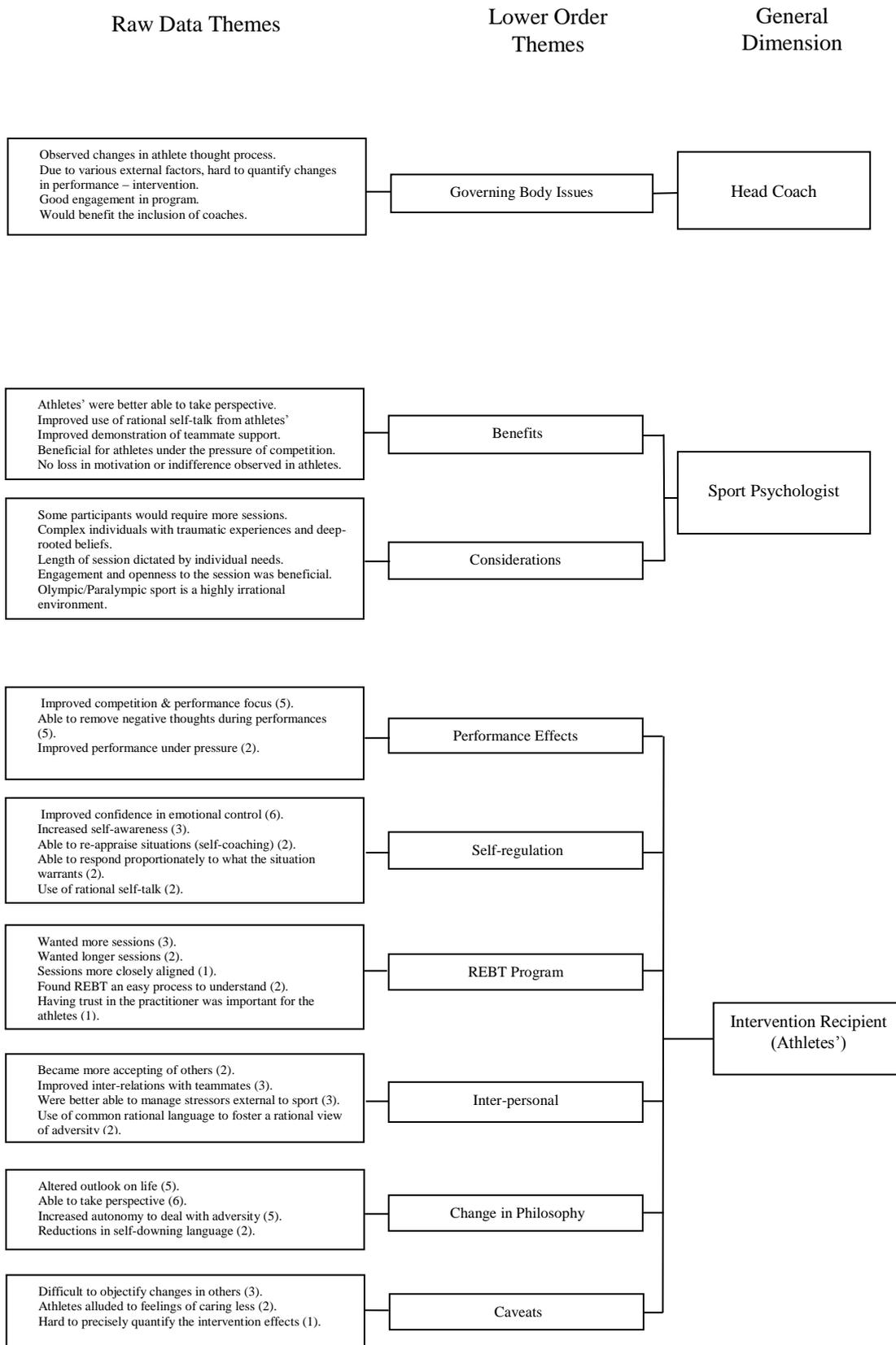


Figure 4.3 Social validation data collected at the end of the REBT intervention. (N) = Number of athletes who cited the theme during the semi-structured interviews.

4.4 Discussion

Addressing aims one and three of the thesis, as well contributing to current understanding into the effects of REBT to enhance performance, this study was the first to examine the immediate and maintained effects of REBT on psychological, physiological, and performance outcomes with elite Paralympic athletes. In addition, addressing aim three of the thesis this study also provided an idiosyncratic examination into the effects of REBT in an under represented elite sample of Paralympic athletes. The findings have implications for practitioners bridging the absence of evidence supporting the effects of REBT to facilitate rational shifts in athletes to not only enhance psychological wellbeing moreover, enhance athletic performance. The current findings also evidence the effective application of REBT within a underrepresented and specialized population of elite athletes with a physical disability.

To address aim one of the present thesis, similarly to the findings from Chapter three and previous research (e.g., Lerner et al., 2007; Turner & Barker, 2013) data analysis highlighted short-term and maintained reductions in IBs as a consequence of the REBT intervention. In contrast to previous studies (e.g., Turner & Barker, 2013, Turner et al., 2014; Yamauchi & Murakoshi, 2001) such reductions in IBs were not coupled with reductions in trait anxiety. This may be explained by the conceptualisation of emotion as a binary construct (Hyland & Boduszek, 2012). RBs lead to functional negative emotions, whilst IBs lead to dysfunctional negative emotions (Dryden & Branch, 2008). Therefore, both functional and dysfunctional emotions can be experienced under low, medium, and high intensities, and marginal or no reductions in anxiety would be predicted because of the REBT intervention. Research using measures that accurately capture emotional functionality are warranted to better ascertain the effects of IBs on emotion and athletic performance.

Although, a few changes were reported in trait anxiety, reductions in IBs as result of the REBT intervention were mostly matched by enhanced athletic performance. These findings support the subjective performance benefits outlined in recent studies (e.g., Turner & Barker, 2013), and importantly contribute to the dearth of research investigating the effects of REBT on objective markers of athletic performance (e.g., Chapter three). Not restricted to sport, the data also contribute to the relatively scant evidence associating reductions in IBs with adaptive behavioural performance. Both greater and maintained reductions in avoidance compared to approach goals may provide one explanation by which reductions in IBs brought around increases in athletic performance. When facing an important competition it is plausible that reductions in IBs (e.g., “it would be terrible if I failed and this would make me a complete failure”) led to experiencing healthy negative emotions (e.g., concern), thus encouraging a shift, focusing from what could go wrong to what could be achieved. Indeed, research has evidenced approach goals to be associated with positive achievement related processes compared to avoidance goals (Jones et al., 2009; Nien & Duda, 2008). To further understand the effects of REBT on athletic performance, a comprehensive examination into the association between beliefs and quality of motivation would offer a fruitful and impactful line of enquiry (Turner, 2016). Theoretically, the influence of IBs on cognitive appraisals (Lazarus, 1991) may also explain improvements in a participant’s performance, whereby irrational and rational beliefs influence an individual’s representation of reality in terms of its personal significance (Turner & Barker, 2014b). Therefore, when facing adversity (i.e., competition) irrational and rational beliefs influence one’s primary and secondary appraisals (David et al., 2002). For example, when approaching or during an important competition IBs may distort and place too great a demand on the athlete and amplify the prospect of failure. Therefore, low levels of IBs will reduce the likelihood of a stress appraisal oriented around

harm/loss and threat, and instead promote a challenge appraisal (e.g., anticipating future gain from encounter; Nicholls, Hemmings, & Clough, 2010).

Analysis of physiological data indicated reductions in IBs were coupled with reductions in resting SBP between pre- and post-intervention time-points. Reductions in SBP were maintained at 9-month follow-up. In-line with previous research (e.g., Harris et al., 2006) these findings show reductions in absolute and rigid IBs may also be associated with lower levels of resting SBP. To explain, Harris et al. proposed “mental rigidity” (p. 5) leads to autonomic rigidity (i.e., increased SBP), whilst “mental flexibility” leads to autonomic flexibility. Thus, raising the possibility that IBs are indicative of ill-health and the process of REBT may foster long-term and adaptive shifts in an athlete’s physiological state. Whilst this finding is novel and supports the notion that IBs are detrimental for physical health (e.g., increased inflammation; Papageorgiou et al., 2006), this may have larger implications for practitioners working with elite athletes with a physical disability. For example, researchers purport high blood pressure is symptomatic in elite athletes who have suffered spinal chord injuries (Theisen, 2012).

Supporting previous research social validation data indicated subjective performance benefits as a result of the REBT intervention (e.g., Turner & Barker, 2013; Chapter three). The ABC (DE) model was reported to provide athletes with enhanced self-awareness, greater emotional control, and increased autonomy when encountering a challenging situation. Furthermore, participants were able re-appraise challenging situation, rationalising the importance or significance of an event and use functional self-talk to enhance competition concentration.

The study indicates the promising effects of REBT, however there are certain limitations to acknowledge when drawing conclusions. The use of a staggered across participants multiple-baseline design reduced threats to internal validity compared to Chapter

3 and provided a more rigorous investigation into the effects of REBT (Barker et al., 2011). In this study there was, however, no control group and data were collected over a 22-week period. It would be prudent to consider alternative factors that may have affected the outcome variables other than the intervention itself (e.g., technical development, periodization of participants training program, inherent change over time, maturation effects). The participants' medical records were not collected prior to the data collection process; thus, the precise effects of any medication on the outcomes measures were partially (i.e., no changes to medication throughout the data collection process), but not completely controlled for. Other than measures of IBs, the remaining dependent variables were only collected from a single time-point and did not account for the inherent variability in the participant's response. For example, fluctuations in environmental conditions during the competition simulations may have had some bearing on the participant's performance scores. Nevertheless, the use of self-report, objective, and social validation measures goes some way to mitigate against these effects (Barker et al., 2013). Aligned with previous research (Turner et al., 2012) the AGQ was shortened from the original 12 to four items (i.e., 1 item per subscale) to minimize the fatigue effects. Based upon this compromise between fatigue and questionnaire sensitivity, caution was and should be taken when interpreting these findings.

This study also examined the effects of REBT on a unique and under-represented sample group. Conclusions regarding the study findings are generalizable to the setting of Paralympic sport, but limited to elite athletes with similar physical disability due to various idiosyncrasies in physical capability, psychology, and psycho-social development. Although, sustained reductions in IBs were highlighted in the present study, social validation data collected from the lead sport psychologist brings to light various complexities and applied considerations when working with Paralympic athletes. Specifically, the athletes' disability, medical history, and traumatic experiences were reported to influence participants' ability to

learn, comprehend, and adopt principles associated with REBT. As well, one participant perceived the IBs to be helpful for their performance, reporting a marginal increase in IBs over the intervention period. The notion that IBs are helpful for athletic performance contrast with results in Chapter three and previous findings. For some IBs may harbour facilitative qualities for performance and warrants further examination.

4.5 Conclusion

Building on Chapter three the present study examined the effects of REBT on physiological and psychological outcomes, and competition simulation scores indicative of athletic performance. Furthermore, an empirical and rigorous applied examination was conducted into the acute and maintenance effects of REBT using a SCD with Paralympic athletes. This is the first study to associate reductions in IBs with physiological measures (reductions in SBP) indicative of an adaptive physiological response, improved athletic performance during competition simulations, and reductions in avoidance goals. In addition, the study findings were supported by social validation data reporting greater self-awareness, emotional control, and enhanced focus during competition as a result of the REBT intervention. Although traditionally a psychotherapeutic model, the core features of REBT appear to offer the basis for optimal human functioning targeting underlying beliefs that elicit fundamental shifts in an athletes' philosophy towards sport that traditional psychological skills (i.e., relaxation, self-talk) are unable to access. The study findings contribute to a marked shift in perspective for effective interventions to enhance athlete wellbeing and athletic performance. The one-to-one application of REBT in psychotherapeutic settings is proposed to offer an intensive and elegant brief intervention (Ellis, 2013) that promotes psychological health. However, in the setting of elite sport time is limited due to its dynamic nature, as a result, brief contact (Giges & Petitpas, 2000) and/or single-contact interventions (Pitt et al., 2015) are proposed to be central to sport psychology services. Furthermore,

considering the brief, cost effective, and pragmatic nature of workshops it offers a popular format by which to disseminate and provide sport psychology support. Whilst previous research has examined the effects of REBT using a workshop format, there is an absence of performance markers, objective measures (i.e., physiological outcomes) and the use of control groups. Subsequently, the effects of a group-based REBT format on athletic performance remain equivocal and difficult to discern. Therefore, building on Chapter four, in Chapter five the effects of REBT on psychological, physiological, and markers of penalty-kick performance during a competitive simulation are examined using a workshop format with an elite blind soccer team.

Chapter 5

Investigating The Effects of Rational Emotive Behaviour Therapy (REBT) on Penalty Shootout Performance in Elite Blind Footballers.

5.1 Introduction

In Chapters three and four the data have highlighted that the application of REBT using a one-to-one format offers a valuable intervention that may reduce IBs and bring about immediate and maintained enhancements in psychological, physiological, and performance outcomes. Addressing shortcomings of previous research and aim three of the thesis, Chapter five examined the effects using a single REBT workshop. Compared to one-to-one delivery, within the dynamic context of elite sport a workshop format offers practitioners a pragmatic medium to educate and disseminate psychological principles to entire teams. Indeed, previous research has evidenced the effects of an REBT on reducing IBs and cognitive anxiety using a workshop format (e.g., Turner et al., 2014; Turner et al., 2015). However, studies have failed to incorporate assessments of performance, or objective physiological measures, as well focussed on able-bodied athletes. Furthermore, Chapter five contributes to the scant research within Paralympic athletes examining the effects of REBT on psychological, physiological, and penalty kick performance in elite blind soccer players.

Previous research has reported promising effects of REBT in reducing IBs and facilitating psychological outcomes using two accepted modalities of practice (one-to-one; group workshop; Froggat, 2005). In-line with previous research (e.g., Cunningham & Turner, 2016; Turner & Barker, 2013) the findings from Chapter three and four support the application and effectiveness of REBT using a one-to-one counselling format. Furthermore, researchers have reported short and long-term reductions in IBs, cognitive anxiety, as well as increases in self-efficacy, perceptions of control, and objective measures of performance. At present, brief contact interventions typically shorter in duration are proposed to offer valuable and timely solution in the dynamic context of elite sport (Giges & Petipas, 2000).

Accordingly, the application of workshops in high performance sport offers a pragmatic and cost effective method for practitioners to disseminate psychological principles (Turner & Barker, 2014).

Specifically, within elite soccer academy settings, data revealed reductions in IBs after receiving a single REBT workshop (Turner et al., 2013). In addition, after receiving multiple REBT workshops, elite soccer academy players reported both short and long-term reductions in IBs (i.e., need for achievement and demand for fairness), as well social validation data indicated improvements in psychological and performance benefits (Turner et al., 2015). The application of REBT has been promising, yet literature lacks a critical mass that includes various methodological shortcomings (e.g., no comparison conditions, over reliance on self-report measures) and fails to include measures of task performance (Turner, 2016). For this reason precise conclusions regarding the effects of REBT on athletic performance are difficult to ascertain and requires more rigorous examination.

Overcoming the limitations of self-report measures (i.e., social desirability; Williams & Krane, 1992) contemporary literature has examined the effects of irrational and rational beliefs on physiological markers. Whereby, most recently and in reference to a stressful scenario researchers reported participants who held IBs recorded greater increases in Systolic Blood Pressure (SBP) indicative of autonomic rigidity, whereas those who adopted rational beliefs recorded decreases in SBP, indicative of autonomic flexibility (Harris et al., 2006). Suggesting that measurement of blood pressure (i.e., systolic and diastolic) may offers an objective indicator for the adaptive or maladaptive nature of an athlete's physiological state prior to a stressful-situation (e.g., penalty kick competition).

In-line with REBT theory a penalty-kick simulation for an elite blind soccer player may present a significant adversity (A). To illustrate, penalty kicks are awarded to the opposing team after accruing three team fouls. The importance of a penalty-kicks are

escalated in the knock-out stage of major international tournaments, whereby if a game is tied at the end of full-time, teams partake in a three-man penalty-kick shootout. In these instances, the teams progression or exit can come down to one player, amplifying the stress a player will experience. Researchers propose a successful penalty kick is in part, a function of a player's psychology (i.e., coping with stress; Jordet, Hartman, Vischer, & Lemmink, 2007).

Acknowledging the stressful nature and importance of a penalty kick researchers suggested REBT may be effective for players who have a predisposition for threat appraisals (e.g., a history of failure during penalty kicks; Wood, Jordet, & Wilson, 2015). To illustrate, REBT aims to reduce a player's core irrational belief of awfulizing (e.g., "it would be the end of the world if I missed"), instead facilitating the rational alternative of anti-awfulizing (e.g., "it would be bad, but it certainly wouldn't be terrible if I missed"), in turn encouraging a player to take perspective and accurately gauge the severity of the consequences, that are often amplified and exaggerated during a penalty-kick situation. Addressing shortcomings of previous research (self-reported measures of performance) in the present study we used a penalty kick simulation as an ecologically valid and meaningful performance by which to assess the effects of REBT. Moving beyond Chapters three and four, the present chapter also examined the effects of a single REBT workshop on the intensity and perceived helpfulness of pre-penalty kick anxiety, baseline physiological measures (e.g., resting blood pressure prior to penalty kick), and performance ratings during a penalty kick shootout with elite blind athletes. Based on previous literature (e.g., Turner et al., 2013; Turner et al., 2015) we hypothesized the REBT intervention would bring about decreases in IBs, reductions in the intensity and increases in the perceived helpfulness of pre-performance anxiety, reductions in baseline systolic blood pressure prior to a penalty-kick simulation, and increased subjective penalty kick rating. Furthermore overcoming methodological shortcomings of previous

studies (e.g., Turner et al., 2014) in the present Chapter the effects of single REBT workshop were compared with an attention placebo group using a pre- and post-test crossover design.

5.2 Method

5.2.1 Participants. Ten members of an elite blind soccer team were purposively recruited for the present study. Participants were aged between 19 and 41 ($M = 28.36$, $SD = 5.54$), and comprised of three fully sighted goalkeepers and seven outfield players with a blind classification (visual acuity poorer than LogMAR 2.60). Within blind football goalkeepers are fully sighted, whereas all outfield players have a B1 classification. Pre-screening procedures confirmed participants had no previous psychological support using REBT principles. Institutional ethics approval and participant consent was obtained prior to data collection (see Appendix 4.1).

5.2.2 Context. The lead author was asked to deliver an intervention that developed the player's ability to perform under pressure, specifically during a penalty kick. In blind soccer, penalty kicks have a large bearing on the outcome of a game. First, after a team accrue three fouls, any fouls thereafter results in a single 8m penalty to the opposing team. Second, a penalty kick is awarded if a goalkeeper interferes with play outside the goalkeeper's area. Finally, during major competition formats, if the game is tied at the end of open play the outcome is determined by a penalty shoot-out. Although, originally three REBT workshops were planned, the pragmatic constraints of working in both an elite sport environment and working with players who are blind restricted the applied intervention to a single-session.

5.2.3 Research design. A quasi-experimental between groups pretest-posttest cross-over design was used to explore the effectiveness of a single REBT workshop with an elite blind soccer team. Specifically, data were collected over four-monthly training camps, and separated into pre-intervention, time-point one, time point two, and post-intervention time points. Initially all data

were collected from participants at pre-intervention. To safeguard threats to internal validity and avoid order effects participants were assigned into one of two groups and counterbalanced accordingly. Outfield players were randomly allocated, whereas goalkeepers were split between Group A ($N = 2$) and B accordingly ($N = 1$). At time-point 1 Group A ($N = 5$) received the REBT workshop, whereas Group B ($N = 5$) were placed into an attention placebo workshop providing a highly valid control condition (Popp & Schneider, 2015). Following this, at time-point three, Group A received the attention placebo workshop and Group B received the REBT workshop. Ultimately, the study design created the conditions for causality and safeguarded threats to internal validity. For example, we would only expect changes in Group A and not in Group B between pre-intervention and time-point 1 because of the experimental intervention.

A between groups pretest-posttest cross over design was used to determine the effects of a single REBT workshop with an elite blind soccer team. Data were collected over four - monthly training camps, and separated into pre-intervention, time-point one, time point two, and post-intervention time points. Initially all data were collected from participants at pre-intervention. To ensure internal validity and avoid order effects participants were assigned into one of two groups and counterbalanced accordingly. To illustrate, at time-point 1 Group A (three outfield players & two goal keepers) received the REBT workshop and Group B (four outfield players & one goal keeper) received an attention placebo control workshop. At time-point three Group A received the attention placebo workshop and Group B received the REBT workshop. All outcome measures and social validation were collected at a post-intervention time point.

5.2.4 Measures

5.2.4.1 Irrational beliefs. The Shortened General Attitudes and Beliefs Scale (SGABS; Lindner et al., 1999) was used to measure participant's total IBs. All four items from the rational belief subscale were removed due to its failure to provide a reliable and

sensitive measure of rational beliefs. In turn the SGABS was reduced from 26 to 22 items (e.g., Turner & Barker, 2013). Participants responded on a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Each item related to one total irrational and six irrational belief content areas (i.e., self-downing, other-downing, need for achievement, need for approval, need for comfort and demand for fairness). Cronbach's alpha coefficient reported internal reliability scores ranging from $\alpha=.73$ to $\alpha= .97$ for total IBs scores across all four time-points.

5.2.4.2 Pre-performance anxiety and perceived helpfulness. The State Trait Anxiety Inventory (STAI Form Y; Spielberger, 1983) consisted of 10 items and was used as a measure of pre-performance anxiety prior to a competitive penalty shoot-out simulation. Participants reported their answers on a 4-point Likert-scale ranging from 1 (*not at all*) to 4 (*very much so*). In addition, participants reported the extent they perceived these feelings to be helpful/unhelpful towards the upcoming penalty kick simulation on a 7-point Likert-scale ranging from -3 (*Not at all helpful*) to 3 (*Extremely Helpful*). The 10 trait anxiety items within the STPI has a high test-retest reliability ($r = .76 - .86$), Cronbach's alpha coefficient ($\alpha= .90$), content, construct and concurrent validity (Spielberger & Reheiser, 2009). In this case a Cronbach's alpha coefficient reported internal reliability scores ranging from $\alpha= .73$ to $\alpha= .91$.

5.2.4.3 Penalty kick performance scores. To ascertain the effects of a single REBT workshop, performance was assessed during a competitive penalty kick shootout across all four time-points by the head-coach. To remove expectation or confirmation bias the head coach was blind to which group and workshop each participant had most recently received. Subject to injury and availability all three goalkeepers and seven outfield players participated in the penalty shootouts. Due to the low scoring percentage associated with blind penalty-kicks the use of objective measure of penalty kick performance (e.g., goal/no goal) was

unable to offer a sensitive assessment of penalty-kick performance – as originally planned. Furthermore, there exists no previous research that has developed performance criteria to assess penalty-kicks performance in blind soccer. Specifically, the performance criteria were generated in conjunction with the head coach, whereby each penalty was reported out of 10 against three key markers: ball strike, accuracy, and power by the head coach on each occasion across all four time-points. Penalty-kick ratings were collected only from the outfield players and were assessed using the subjective rating of the head coach. The penalty kick simulation in part mimicked the format of a major championship. Specifically, each player took three penalty-kicks alternately from both the 6 metre and 8 metre penalty spots.

5.2.4.4 Physiological markers. Prior to the upcoming penalty kick simulations measures of heart rate, systolic, and diastolic blood pressure were collected using the Finometer PRO (Finapres Medical Systems, Netherlands), a validated apparatus to measure cardiovascular indices (e.g., Kaltoft et al., 2010). Prior to each data collection time-point participants were notified of the upcoming penalty-kick competition to be conducted on the last day of a training camp. A day prior to the penalty-kick competition participants mean scores across Heart Rate (HR), Systolic Blood Pressure (SBP), and Diastolic Blood Pressure (DBP) were monitored over a five-minute period, in-line with previous research (e.g., Turner et al., 2013).

5.2.4.5 Social validation. Upon completion of the post-intervention data collection phase social validation data was collected using semi-structured interviews were conducted with the participants to determine the perceived effectiveness of the REBT intervention (Page & Thelwell, 2013). Specifically, the interviews focused on three key areas of social validity as identified by Wolf (1978): social significance of the goal(s), social appropriateness of the procedures, and social importance of the effects.

5.2.5 Data collection procedures. Participants were provided with a 30-minute introduction session to the research project and familiarized with the research protocol. All self-report (i.e., IBs, pre-competitive anxiety), physiological measures (i.e., SBP and DBP) and performance scores (i.e., penalty kick performance) were collected at each of the four training camps, that were distinguished into pre-intervention, intervention one, intervention two and post-intervention time-points. During each camp all participants were allocated a time slot to complete a series of self-report measures, following this baseline physiological measures of resting HR SBP, and DBP were collected. Participants were again asked to complete a series of self-report measures in reference to the upcoming competitive penalty kick simulation. The contents of the questionnaires were dictated to the participants by the first and fourth author. On the final day of each camp all players took part in a competitive penalty kick simulation mimicking the format used within major competitions.

5.2.6 Experimental intervention. To ensure the REBT workshop was delivered consistently across both groups and to maintain procedural reliability an intervention workshop manual (available on request from lead author) was created collaboratively with the second and third authors. To facilitate the palatability and the removal of clinical connotations associated with the term “therapy” the workshop was named “Smarter Thinking” (see Turner, 2014). The intervention comprised a single 60-minute educational REBT workshop that included three separate stages based upon the ABC (DE) model (Dryden & Branch, 2008; Dryden & Neenan, 2015; Ellis & Dryden, 1997). In-line with previous research (e.g., Turner & Barker, 2014) a relaxed and discussion-based session was structured that included discussions, self-disclosure (e.g., IBs, unhelpful consequences to adversity), and practical adoption of rational self-statements. Furthermore, participants understanding and agreement with the ABC (DE) model was gauged via verbal feedback and the periodic use of open questions (i.e., “how well have you understood the model so far?”).

Initially, the players were educated on the ABC model, discussing their thoughts, feelings, and behaviours in response to situations where they were required to take a penalty-kick, whilst emphasizing the central role of beliefs in determining the functionality of their response. Following this, participants were educated on the four core IBs, and taken systematically through the disputation process (D) using empirical, logical, and pragmatic disputes (Dryden & Branch, 2008). For example, when disputing the irrational demand “*I must be successful*” or awfulising belief “*if I missed the penalty it would be the end of the world*” the participants were questioned as to how true, logical, and helpful these beliefs would be for their performance. Finally, rational alternatives (E) for the four IBs were presented, for example: “*I really want to be successful, but that doesn’t mean I have to be*” or anti- awfulising belief “*if I missed the penalty it would be bad, but not the end of the world*”. Finally, the functional and helpful influence of the new rational beliefs on thoughts, feelings, and behaviours were discussed.

In contrast to a typical REBT workshop (e.g., Turner & Barker, 2014) the delivery of the REBT intervention was tailored to meet the participant’s needs. Specifically, instead of using visual aids (e.g., handouts, projector screen) the session was staggered in three sections, whereby the lead author acted as the educator and group facilitator asking participants to each share their thoughts to the rest of the group. Instead of offering reading assignments each player was provided with a 30-minute audio recording that recaptured and outlined the content covered during the workshop.

5.2.7 Attentional placebo workshop. The attention placebo workshop controlled for the possibility that improvement by the experimental group was a result of a placebo effect (Boot, Simons, Stothart, & Stutts, 2013), thereby increasing the confidence in the causal effects of the REBT workshop. The attention placebo condition (Popp & Schneider, 2015) involved discussing examples of the best sport teams in the world, and the subsequent impact

this had on both performance and success in major competitions. Each participant was provided with five minutes to collate their thoughts, and then presented their examples back to the group – each case was followed by small group-based discussion. The attention placebo workshop lasted for 60-minutes in total.

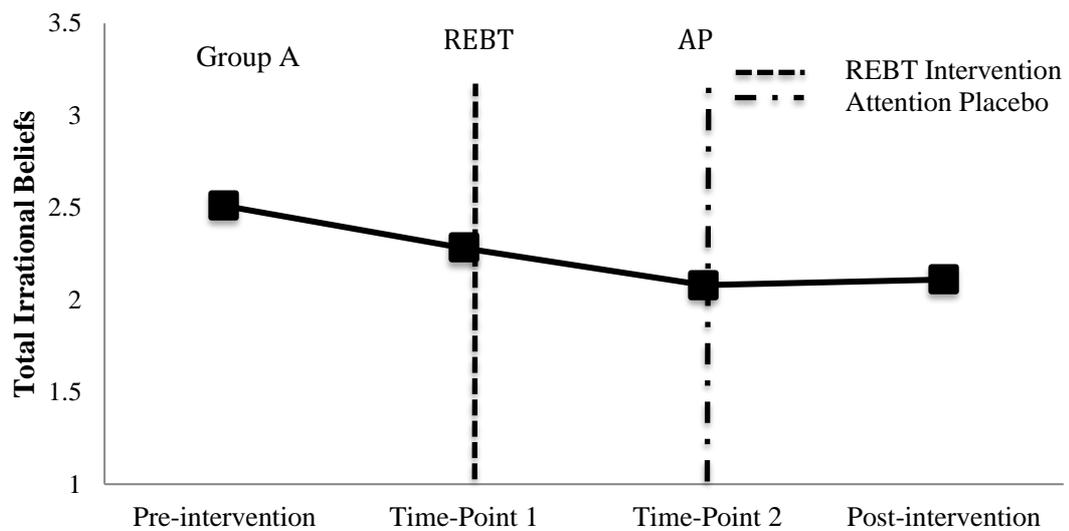
5.2.8 Procedural reliability. To ensure procedural reliability the intervention was delivered using a workshop manual to guide the REBT intervention and attention placebo conditions (Barker et al., 2013). At the end of the workshops participants were asked if they found any elements challenging or ambiguous, in turn any queries voiced were addressed.

5.2.9 Analytic strategy. A small sample size ($N \leq 5$) is associated with low statistical power, inflated false discovery rate, and low reproducibility (Button et al., 2013) thus inferential statistics were not deemed suitable for the present analyses. In its place, intervention effects were assessed using descriptive statistics, and guidelines as seen in single-case designs (Barker et al., 2013). To explore the magnitude of the intervention effectiveness Effect Sizes (ES) were calculated using Cohen's d (Cohen, 1998). Specifically, where $M_1 - M_2$ indicates the difference between mean group scores between two different data-points. Whereas SD_1 refers to the mean standard deviation of groups scores at the first time-point, and SD_2 the mean standard deviation of group scores at the second data point: Cohen's $d = M_1 - M_2 / SD_{pooled}$ (where $SD_{pooled} = \sqrt{(SD_1^2 + SD_2^2) / 2}$). Effect size data were interpreted in reference to small effect size $<.87$; medium effect size $.87- 2.67$; and large effect size >2.67 (Parker & Vannest, 2009). Mean change scores were also calculated between pre-intervention, time-point 1, time-point 2, and post-intervention time points across both Groups A and B. Descriptive statistics (M and SD), and change scores (mean change and *Effect size*) between time-points for both groups A and B are reported in Table 5.1.

5.3 Results

5.3.1 Irrational Beliefs.

There was a small decrease in total irrational beliefs after receiving the REBT intervention in both Groups A ($M = -.23$, $d = -.64$) and B ($M = -.49$, $d = -.59$). Furthermore, reductions in irrational beliefs were maintained between pre- and post-intervention time-points, reporting a medium decrease in Group A ($M = -.40$, $d = -1.11$) and a small decrease in Group B ($M = -.20$, $d = -.36$). After first receiving the REBT intervention participants in Group A reported a medium decrease ($M = -.20$, $d = -1.05$), whereas participants Group B after receiving the attention placebo session at time-point 1 reported an increase ($M = .50$, $d = 1.09$) in total irrational beliefs compared with pre-intervention scores (see Figure 5.1).



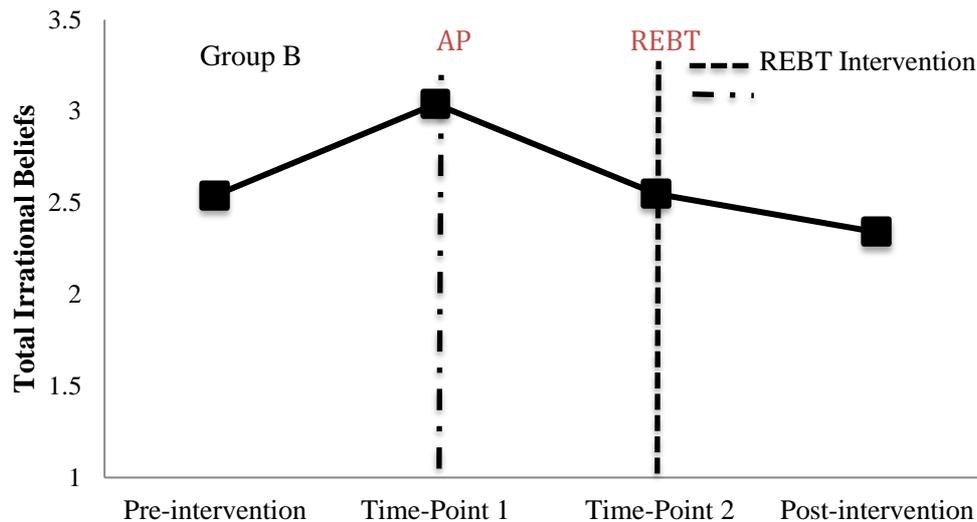


Figure 5.1. Mean irrational belief scores for Groups A and B at pre-intervention, intervention one, intervention two, and post-intervention time points.

5.3.2. Pre-Performance Anxiety.

Participants in Group A reported a medium decrease ($M = -.31, d = -1.55$) in pre-performance anxiety prior to the penalty-kick simulation after receiving the REBT intervention at time-point 1. However, such reductions were not maintained, instead a reporting a large increase ($M = .41, d = 4.56$) at time-point 2 after receiving the attention placebo session. Participants in Group B reported a small increase ($M = .19, d = .30$) in pre-performance anxiety prior to the penalty-kick simulation after receiving the REBT intervention at time-point 2, further reporting no changes between pre-intervention and post-intervention time points. A small decrease ($M = -.18, d = -.62$) in pre-performance anxiety was also reported at time-point 1 after receiving only the attention placebo session. Participants in Group A reported a small increase ($M = .12, d = .14$) in perceived helpfulness of pre-performance anxiety prior to the penalty-kick simulation after receiving the REBT intervention. Small increases in perceived helpfulness were also maintained in Group A, between: time-point 1 and time-point 2 ($M = .22, d = .17$). Participants in Group B reported a small decrease ($M = -.40, d = -.33$) in perceived helpfulness after receiving the attention

placebo session, whereas indicating a small increase ($M = .73, d = -.64$) after receiving the REBT intervention between time-point 1 and time-point 2. Such increases were not maintained between pre- and post- intervention time points (see Table 5.1).

5.3.3. Physiological Markers.

Mean levels of resting SBP collected prior to the penalty-kick simulation showed a medium decrease ($M = -22.74, d = -1.23$) in Group A and a small decrease in Group B ($M = -5.78, d = .48$) after receiving the REBT intervention. However, small reduction were reported in SBP in Group B ($M = -6.07, d = -.49$) after the attention placebo session at time-point 1. A small, decrease in Group A ($M = -4.36, d = -.24$) and increase in Group B ($M = 3.84, d = .30$) were reported between pre- and post-intervention time points (see Table 5.1).

5.3.4. Penalty Kick Performance

Data from Group A reported a small increase in accuracy ($M = .47, d = .80$) and power ($M = .39, d = .55$), as well a medium decrease in ball strike ($M = -.55, d = -2.49$) after receiving the REBT intervention (pre-intervention and time-point 1). In Group B data showed a small decrease in ball strike ($M = -.24, d = -.12$) and power ($M = -.28, d = -.11$), as well, a medium decrease in accuracy ($M = -1.36, d = -1.70$) after receiving the intervention. Notably between time-point 1 and time-point 2 participants in both Group A and B reported reductions in penalty ball strike, accuracy, and power.

5.3.5. Social validation. Social validation indicated that the REBT intervention was received positively, and the provision of the ABC model offered participants an insight into the formation of emotions and behaviours, having benefits on their emotional control. For example one athlete noted “I am quite cynical about psychological based workshops, so for me to find it useful shows that there must be something good in the approach”. All athletes’ noted psychological benefits stemming from the group based delivery of the REBT

intervention. The session afforded athletes an insight into their teammates mind-set and that created a shared appreciation into each other's perspectives. The REBT intervention also helped athletes normalize the ubiquitous nature of negative emotions, whilst reaffirming a helpful versus unhelpful distinction when approaching adversity. One athlete noted "the session helped reaffirm my preparation for pressurized situations". Whilst the players noted enhanced psychological benefits, they reported difficulties in directly quantifying the effects of the REBT intervention on performance. Furthermore, the use of a single workshop was reported to be insufficient for a comprehensive understanding and adoption of the REBT intervention. For example participants stated "I considered this workshop as part of an incremental process, but it would be hard to quantify its effects and although it was useful and informative to discuss the ABC model, I found it hard to use as it was only one session.

Table 5.1

Means (SD) for dependent variables across time-points and mean percentage change scores (effect size) between time-points

Group A ^a	Mean (\pm SD)				Mean Change Scores (Cohen's <i>d</i>)			
	Pre-intervention (Pre)	Time Point 1 (TP1 – Exp)	Time point 2 (TP2 – AP)	Post-intervention (Post)	Pre – TP1 (REBT)	TP1 – TP2 (AP)	TP2 – Post	Pre-Post
Irrational Beliefs	2.51 (.36)	2.28 (.19)	2.08 (.29)	2.11 (.29)	-0.23 (.64)	-0.20 (1.05)	0.03 (.10)	-0.40 (1.11)
Penalty ball strike score	7.66 (.23)	7.11 (.59)	6.89 (.96)	7.17 (.34)	-0.55 (2.39)	-0.22 (.37)	0.23 (.29)	-0.54 (2.13)
Penalty accuracy score	5.75 (.59)	6.22 (.75)	4.95 (1.07)	5.61 (3.81)	0.47 (.80)	-1.27 (1.69)	0.66 (.62)	-0.14 (.24)
Penalty power score	6.50 (.71)	6.89 (.67)	6.50 (1.17)	6.89 (.54)	0.39 (.55)	-0.39 (.58)	0.39 (.33)	0.39 (.55)
Anxiety intensity	1.62 (.20)	1.31 (.09)	1.72 (.46)	1.44 (.46)	-0.31 (1.55)	0.41 (4.56)	-0.28 (.67)	-0.18 (.90)
Anxiety perceived helpfulness	1.00 (1.22)	1.17 (.98)	1.34 (.89)	1.2 (1.3)	0.12 (.14)	0.22 (.17)	-0.14 (.97)	0.20 (.16)
Heart Rate	65.30 (15.35)	63.46 (7.53)	63.66 (11.44)	63.26 (13.36)	-1.84 (.12)	0.20 (.03)	-0.40 (.03)	-2.04 (.13)
Diastolic Blood Pressure	88.21 (10.81)	72.49 (8.66)	78.10 (11.04)	83.44 (7.24)	-15.72 (1.45)	5.61 (.65)	5.34 (.48)	-4.77 (.44)
Systolic Blood Pressure	140.67 (18.47)	117.93 (15.07)	128.40 (14.60)	136.31 (6.39)	-22.74 (1.23)	10.47 (.69)	7.91 (.54)	-4.36 (.24)
Group B ^b	Pre-intervention (Pre)	Time Point 1 (TP1-AP)	Time point 2 (TP2-Exp)	Post-intervention (Post)	Pre – TP1 (AP)	TP1 – TP2 (REBT)	TP2 – Post	Pre-Post
Irrational Beliefs	2.54 (.46)	3.04 (.83)	2.55 (.58)	2.34 (.84)	0.50 (1.09)	-0.49 (.59)	-0.21 (.02)	-0.20 (.36)
Penalty ball strike score	5.88 (2.05)	6.79 (1.99)	6.55 (1.07)	7.26 (.84)	0.91 (.44)	-0.24 (.12)	0.71 (.66)	1.38 (.67)
Penalty accuracy score	4.13 (.38)	6.75 (.80)*	5.39 (1.75)	5.99 (1.18)	2.62 (6.89)	-1.36 (1.70)	0.60 (.34)	1.86 (4.89)
Penalty power score	6.04 (1.82)	6.5 (2.65)	6.22 (1.00)	7.17 (.71)	0.46 (.25)	-0.28 (.11)	0.95 (.95)	1.13 (.62)
Anxiety intensity	1.69 (.29)	1.51 (.63)	1.70 (.65)	1.69 (.58)	-0.18 (.62)	0.19 (.30)	-0.01 (.02)	0.00 (.00)
Anxiety perceived helpfulness	1.00 (1.22)	.60 (1.14)	1.33 (.58)	.80 (1.48)	-0.40 (.33)	0.73 (.64)	-0.53 (.91)	-0.20 (.16)
Heart Rate	78.30 (5.21)	74.26 (2.78)	73.17 (6.61)	73.40 (12.04)	-4.04 (.78)	-1.09 (.39)	0.23 (.03)	-4.90 (.94)
Diastolic Blood Pressure	93.37 (6.34)	77.00 (7.53)	75.24 (13.71)	87.35 (9.08)	-16.37 (2.58)	-1.76 (.23)	12.11 (.88)	-6.02 (.95)
Systolic Blood Pressure	134.56 (12.66)	128.49 (11.95)	122.71 (20.17)	138.40 (13.35)	-6.07 (.49)	-5.78 (.48)	15.69 (.78)	3.84 (.30)

Note. ^a Group A completed the REBT (Exp) workshop at time point 1 and attention placebo (AP) condition at time point 2.

^b Group B completed the attention placebo (AP) condition at time point 1 and REBT (Exp) workshop at time point 2.

5.4 Discussion

Addressing aims one and three of the thesis, in Chapter five the effects of a single REBT workshop was examined on important pre-performance anxiety, physiological measures of blood pressure, and performance ratings during a penalty kick shootout with elite blind soccer players. Building on Chapter three and four the present Chapter is the first to glean professional practice insights into the effects and application of REBT using a workshop format with elite blind footballers. The results suggest that a single REBT workshop was effective in immediately reducing participant's total IBs. The findings also evidence the first successful application of REBT as an intervention to reduce IBs within a specialized sample of elite blind soccer players. Participants in Group A reported maintained reductions in IBs, whereas participant's in-group B reported marginal increases in IBs after receiving the attention placebo workshop. These results support the findings from previous research (e.g., Turner et al., 2013) suggesting that a single REBT workshop was effective in reducing IBs, however, the intervention dose may not be sufficient to ensure maintained reductions.

The results also indicate that the REBT intervention elicited only immediate reductions in pre-performance anxiety prior to the penalty-kick simulation for Group A, whereas no reductions were reported in Group B. In part, this contrasts with previous findings (e.g., Turner & Barker, 2013) that evidenced reductions in cognitive-anxiety after receiving REBT intervention. This could be explained by differences in intervention modality (i.e., one-to-one session) and/or intervention dose (three sessions and two homework tasks), thus a single-workshop may be insufficient to expect meaningful changes in the intensity of cognitive anxiety. However, data indicates the REBT workshop was effective in immediately increasing perceived helpfulness of their self-reported pre-performance anxiety for both groups, nonetheless at a pre-intervention time point such increases were maintained only

within group A. On this basis it could be postulated that instead of reducing the intensity of the player's anxiety, the REBT workshop may have encouraged an acute shift in participant's perception of pre-performance anxiety towards a penalty-kick performance. Certainly, these findings are consistent with the binary view of emotion formation, whereby both unhelpful and helpful negative emotions can be experienced under low, medium, and high intensities (Hyland & Boduszek, 2012). Thus, we would expect little changes in participants' intensity of emotion (e.g., pre-performance anxiety) prior to a competitive penalty-kick. Nevertheless, there exists no validated measure of emotion function within the literature, making the qualitative assessment of emotion in-line with REBT theory difficult.

Previous research that examined the role of psychology and penalty-kick outcomes has suggested REBT to be valuable for players who have a predisposition for threat appraisals (e.g., Wood et al., 2015). Findings indicate that although some reductions were reported in IBs REBT this had little effect on performance ratings during a penalty kick simulation. This could be explained by first, a single REBT workshop was insufficient in bringing around substantial reductions in IBs, and thus no changes were ascertained in penalty-kick performance. Second, by measuring performance over four separate testing sessions participants may have been systematically desensitized to the penalty-kick simulation and minimized the influence of IBs on task performance. Finally, due to the player's visual impairment there was greater variability in the technical execution of the penalty-kicks, in-turn making the causal effects of the REBT intervention on penalty-kick performance difficult to accurately determine. Nonetheless, researchers have evidenced the negative associations between perceived importance and outcome of a penalty kick in elite soccer players during world-cup and major championships (e.g., Jordet et al., 2007). Therefore, considering the potential benefits of a rational belief (i.e., anti-awfulizing) on penalty kick performance by reducing the perceived outcome importance, the examination

into the effects of REBT, that is the endorsement of a rational philosophy towards performance during a penalty-kick offers a fruitful avenue for future investigation.

Data indicated reductions in IBs were also coupled with acute reductions in pre-intervention measures of SBP measured prior to a penalty-kick shootout after receiving the REBT intervention. In-line with Chapter four the results partially support the notion that ‘mental rigidity’ (Harris et al., 2006, p 5), that is rigid and absolute thinking is associated with autonomic rigidity (e.g., increased in SBP) prior to a real-life stressful situation. This data aligns with the postulation of REBT theory and previous research (e.g., Papageorgiu et al., 2006) indicating IBs may determine a maladaptive physiological state (i.e., increase in SBP), whereas rational beliefs may lead to an adaptive physiological state (i.e., decrease in SBP). Although, the adoption of physiological markers offers an objective assessment into the effects of REBT, and irrational and rational beliefs on athletic performance, research in this area lacks a critical mass and warrants further investigation, such as physiological arousal (Master & Gershman, 1983) and cardiovascular indices of challenge and threat (Turner et al., 2012).

In-line Chapters three and four social validation supported the changes in participant’s IBs, as well as subjects perceived performance benefits from the REBT workshop. However, the use of a single-session was deemed insufficient for athletes to fully comprehend the ABC model. In addition, researchers suggest the use of a single session may have detrimental effects on rapport building and the constructive collaboration between the practitioner and the athlete (Dryden, 2006). The present findings indicate that a player may understand and even agree with a rational principle but a single-session alone is insufficient in promoting and maintaining a rational philosophy towards success and/or failure. Acknowledging the findings from Chapters three and four, practitioners are advocated to use a series of sessions to facilitate fundamental shifts in a players beliefs. Although, using a case-study approach

the findings from Chapter three best represents the enhancing effects of REBT delivered comprehensively. Nevertheless, social validation gleaned various benefits from using a group-based REBT modality. These included normalising players concerns about competition and negative emotions, providing a shared understanding into their teammates perspectives, and allowing players to role model and learn best practices from one another. Such benefits may be explained by adjustments to a ‘typical’ REBT workshop (e.g., Turner & Barker, 2014) that accommodated the participant’s visual impairments. To illustrate, the protocol mirrored that of Personal Disclosure Mutual Sharing (PDMS; Holt & Dunn, 2006), whereby each player was in-turn asked to consider and disclose examples of an ABC model. Accordingly, in contemporary researchers have examined the effects of Rational Emotive PDMS (REPDMS; Vertopoulos & Turner, 2017) on IBs and RBs, reporting a single-session offered positive effects over and above that of REBT education alone. Addressing aim three of the present thesis, this finding indicates the successful application of REBT as a workshop format is largely a function of greater interaction and mutual disclosure rather than to solely gleaning insights into the ABC(DE) model. To this end, the use of REBT and PDMS may offer an effective means of promoting a rational philosophy in athletes, whilst also enhancing the closeness, understanding, and communication between team mates (Windsor, Barker, & McCarthy, 2011).

5.4.1 Limitations and Future Directions

There are some critical reflections, limitations, and future recommendations that should be recognised when drawing conclusions from the present chapter. Although, relatively short-term reductions were observed, the present findings indicate that for meaningful and long-term effects a single REBT workshop was insufficient (Ellis & Dryden, 1997; Turner & Barker, 2014). Initially three workshops were intended, however the feasibility was constrained by a trade-off between maintaining scientific and/or

methodological rigor (i.e., cross-over design) and the constraints of conducting field-based research in elite sport and with those who are visually impaired (e.g., operating self-report measures, logistics, data collection protocol). Essentially, the minimized intervention dose may have threatened the internal validity of the present study, making conclusions regarding the precise effects of the single-REBT workshop on the outcome variables harder to discern. The interpretation of a single-data point should be approached with caution due to natural variation. Performance development is rarely linear and after a good performance, subsequent attempts are highly likely to deteriorate (Barker et al., 2011). To illustrate, participants appear to demonstrate regression between time-points 1 and 2. Accordingly, future studies are recommended to follow principles typical of a single-case research design (i.e., collection of stable baseline data, staggered intervention delivery; Barker et al., 2011) to better ascertain the intervention effects. Similarly to Chapter four this study also examined the effects of REBT on a unique and under-represented sample group (i.e., elite blind soccer players). Conclusions regarding the study findings are generalizable to the setting of elite disability sport, but again limited to elite athletes with visual impairments of similar severity. Finally, while in the present study a single-item was included to ascertain the perceived functionality of the participant's pre-performance anxiety, the binary model of emotion purports individuals experience two functionally and qualitatively distinct emotions (i.e., concern vs. anxiety; Hyland & Boduszek, 2012).

5.5 Conclusion

The present chapter overcame shortcomings of previous research (i.e., lack of control group, performance and objective markers) and built on Chapter four, examining the effects of REBT using a workshop, rather than a one-to-one format. Specifically, in Chapter four the effects of a single-REBT workshop on pre-performance anxiety (intensity and perceived helpfulness), physiological measures of blood pressure, and performance ratings during a

penalty kick shootout in elite blind soccer players were examined. In-line with previous researchers using a workshop format (e.g., Turner et al., 2014; Turner et al., 2015) to data suggests a single workshop format was coupled with acute but not maintained reductions in IBs. Moving beyond previous research the data also reported altered perceptions of pre-performance anxiety, and baseline physiological measures (SBP) prior to a competitive penalty kick performance. Whilst contributing to the growing body of research that examines the efficacy of REBT using a group-based modality, the findings suggest a single group workshop is insufficient to promote meaningful and lasting changes in an athlete's beliefs. Whereas, a group modality may offer alternative benefits (e.g., normalisation of negative emotions) not present when delivering REBT on a one-to-one basis. Specifically, social validation indicated that the disclosure and mutual sharing used in the single REBT workshop may offer a fruitful modality to also develop the inter-relations between players.

REBT is originally a psychotherapeutic approach and its recent emergence within sport psychology literature means there is a absence of professional practice literature that details its application (e.g., Turner & Barker, 2014). While Chapters three, four, and five describe the logical and formulaic application of REBT, the process of challenging and disputing an athletes belief, and effectively applying REBT can be a sensitive and challenging endeavour, certainly one that requires sufficient theoretical and practical insight (Dryden & Neenan, 2015). Furthermore, there is scant research that documents the application of sport psychology interventions with elite athletes with a disability. Considering this, in-line with aims two and three of the present thesis, in Chapter five a reflective and informative practitioner insight into the application of REBT (i.e., the ABCDE model) is provided. Specifically, delineating professional practice insights into first, the application of REBT with elite athletes using a variety of formats, and second, reflecting on the delivery of psychological support to athletes with a disability. Ultimately, having valuable implications

for practitioners looking to adopt REBT with able bodied and Paralympic athletes within the setting of elite sport.

Part II: Experimental Phase

Chapter 6

Investigating the Effects of Irrational and Rational Self-Statements on Motor-Skill Performance, Hazard Perception Performance, and Task Persistence.

6.1 Introduction

Part I provided an applied and idiographic examination into the effects of REBT on athletic performance. Part I also reported the promising effects of REBT as a performance-focused intervention, however more rigorous investigation into the influence of irrational and rational beliefs on acute performance was warranted. By determining the effects of REBT, more specifically irrational and rational beliefs on performance within applied and experimental settings a number of important benefits are proposed. First, measures can determine the effects of irrational and rational beliefs on performance in controlled settings. Second, in-line with previous research (Turner et al., 2012) a meaningful performance situation can be created to sensitively assess the effects of IBs and RBs across various self-reported and objective outcomes. Finally, the assessment of performance effects allows for greater generalizability in the findings across various settings (e.g., military, business, performing arts). In-line with aim two of the present thesis Part II provides an experimental examination into the effects of irrational and rational approaches (self-statements) on acute motor-skill performance (Experiment 1), hazard perception performance, and task persistence (Experiment 2) was conducted.

Central to REBT is the premise that IBs lead to psychological disturbance, whereas RBs lead to enhanced psychological well-being (David et al., 2005). IBs are characterised as extreme, rigid, illogical, and when encountering adversity (i.e., failure, rejection, or poor treatment) lead to unhealthy negative emotions (e.g., anxiety, depression) that propagate maladaptive behaviours (i.e., avoidance or escape-based behaviours) and hinders goal achievement (Dryden & Branch, 2008). Instead, RBs are non-extreme, flexible, logical, and when encountering adversity are purported to lead to healthy negative emotions (e.g.,

concern, sadness) that facilitate adaptive behaviours (i.e., approach or assertive behaviours). When encountering adversity an individual's beliefs are central in determining the functionality of emotional and behavioural responses towards goal achievement (Ellis & Dryden, 1997), consequently having clear implications for those operating in performance contexts.

RBs are proposed to reduce excessive concerns of failure and likely to lead to a healthy negative emotion (e.g., concern) and exert a positive influence on performance (Kombos et al., 1989). IBs are proposed to lead to an exaggeration of the importance of performing well and being accepted by others, which may lead to unreasonable and self-imposed demands that are largely unattainable (Bonadies & Bass, 1984). Furthermore, the anticipation that it would be "awful" (100% bad) when faced with failure, rejection, or poor treatment, may lead to an unhealthy negative emotion (e.g., anxiety) and therefore hinder performance (Turner & Barker, 2014a). Amongst the scant evidence base, Schill et al., (1978) first evidenced that the adoption of irrational self-talk led to significantly more errors on a mirror-tracing task (i.e., reduced behavioural efficiency) compared to rational self-talk and control conditions. Additionally, the adoption of irrational self-talk has also been associated with reduced performance efficiency and increased anxiety during a mirror-tracing task, (e.g., Bonadies & Bass, 1984), as well as reduced performance during a series of trail making tasks (Kombos et al., 1989). Nevertheless, studies have reported only partial support for this hypothesis. For example, researchers have reported participants who adopted rational self-talk instead of irrational self-talk reported decreased anxiety, whilst reporting no differences in persistence during an insolvable performance task (e.g., Rosin and Nelson, 1983). Evidence indicates the adoption of irrational self-talk may hinder task performance and reduce behavioural efficiency, (e.g., Bonadies, & Bass, 1984; Kombos et al.; Schill et al.,

1978), however, findings remain inconclusive due to a lack of critical mass and methodological shortcomings within the studies.

To explain, previous studies have largely relied upon the use of imagined rather than real stressful events, whereby irrational self-statements are thought to only activate during real-life and meaningful situations (e.g., Ellis, 1994). Previous studies have also: failed to include a control group (e.g., Bonadies & Bass, 1984), used leading statements (e.g., participants were told these statements would help reduce errors in performance; Schill et al., 1978), failed to discern the believability of the self-statements, and used performance tasks that lack in ecological validity (i.e., mirror-tracing task). Further, although researchers suggest that self-talk is better characterised in terms of directional interpretation (e.g., Hardy, 2006), no studies have yet matched the perceived helpfulness of irrational and/or rational self-talk statements with performance outcomes. On these grounds the investigation into the effects of irrational and rational self-talk on performance warranted more rigorous examination.

In sum, there is a paucity of objective and empirical research that examines the effects of IBs and/or RBs on performance. Moving beyond previous research methods and shortcomings, in the current study I aimed to conduct a rigorous examination into the effects of irrational and rational beliefs on behaviour using measures of competitive performance. In-line with aim two of the present thesis, and contributing to the literature the effects of irrational and rational self-statements on cognitions, emotions, and performance are examined. To illustrate, in Experiment 1 a laboratory-based competitive golf-putting task was used as a measure of motor-skill performance (e.g., Wulf & Su, 2007). In Experiment 2 a modified hazard perception task was used as an objective measure of performance efficiency (visual search behaviour) and performance effectiveness (hazard perception performance). In addition, a breath-holding task was used to measure task persistence.

6.2 Experiment 1

In Experiment 1 the effects of irrational and rational self-statements on performance outcomes, pre-performance anxiety, concentration disruption, and the perceived helpfulness of self-statements were examined. Previous research demonstrates that participants who adopt irrational self-statements record lower behavioural efficiency during a visual-spatial task compared to participants who adopt rational self-statements (e.g., Bonadies, & Bass, 1984; Kombos et al., 1989; Schill et al., 1978). Similarly, in Experiment 1 self-statements closely aligned with REBT theory (DiGiuseppe et al., 2014) were used to promote irrational and rational performance approaches to a competitive golf-putting task (e.g., Wulf & Su, 2007) and assess performance. Addressing the limitations of past research (i.e., tasks lack in ecological validity) a motor-skill task was used as a measure of performance whilst controlling for participants total irrational belief scores. Furthermore, a real-life motivated performance situation rather than imagined scenario was created using competitive task instructions (e.g., Turner et al., 2012). Participants baseline task proficiency perception of the self-statements in terms of helpfulness and believability were also controlled within the research methodology. Based on previous research the findings from Part I it was hypothesised that when participants used irrational self-statements they would report higher-levels of pre-performance anxiety, higher performance concentration disruption, and achieve lower performance scores in the competitive golf-putting task compared to when they used rational self-statements. Finally, it was hypothesised participants would perceive the rational self-statements to be more helpful towards the performance task, but report no differences in believability between self-statement conditions.

6.3 Method

6.3.1. Participants.

To estimate the appropriate number of subjects for this study statistical software package: G*Power 3 was used. Previous research most akin to the present study in research design, experimental manipulations (i.e., motivated performance situation), and dependent variables (i.e., anxiety, task performance, performance efficiency; Visla et al., 2016; Wilson, Wood, & Vine, 2009, Wood, Hartley, Furley, & Wilson, 2016) reported moderate to large effects, thus supported the expectation for medium effects ($\eta^2_p = .06$ in the present study. Partial eta squared was calculated as: $SS_{\text{effect}} / (SS_{\text{effect}} + SS_{\text{error}})$. Based upon a repeated measures within-subjects design, a medium effect size (partial eta squared; $\eta^2_p = .06$), alpha value ($\alpha = .05$), and a power of .80 an a priori power analysis showed a minimum number of 51 participants were required within each condition. Due to recruitment and temporal constraints within the research process, the present study failed to recruit 51 participants for each condition. In the present study 35 undergraduate students (26 = Male, 9 = Female) were purposively recruited at a UK university aged between 18 and 53 years ($M_{\text{age}} = 20.92$, $SD_{\text{age}} = 5.62$). Institutional ethical approval and participant consent was obtained prior to all data collection.

6.3.2 Measures.

6.3.2.1 Trait irrational beliefs. The Shortened General Attitudes and Beliefs Scale (SGABS; Lindner et al., 1999) was used as a measure of total IBs . Consisting of 22-items, the total irrational belief subscale reported a good internal reliability score of $\alpha = .84$. The SGABS has good test-retest ($r = .91$; Lindner et al., 1999), construct, criterion, discriminant, convergent and concurrent reliability (MacInnes, 2003). The rational belief subscale consisted of 4 items and reported an unacceptable internal reliability score of $\alpha = .38$ and was omitted from the data analysis process. Participants reported on a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) the extent they agreed with each statement.

6.3.2.2. Pre-performance anxiety. The State Trait Anxiety Inventory (STAI; Spielberger, 1983) includes 20-items which assessed pre-performance state- anxiety. Participants reported their answers on a 4-point Likert-scale ranging from 1 (*not at all*) to 4 (*very much so*). A Cronbach's alpha coefficient reported an excellent internal reliability score $\alpha = .93$. The STAI has reported adequate convergent, discriminant, and construct validity (Gros, Antony, Simms, & McCabe, 2007).

6.3.2.3. Concentration disruption. Items associated with concentration disruption subscale were taken from the Sport Anxiety Scale-2 (SAS-2; Smith, Smoll, Cumming, & Grossbard, 2006) measuring concentration during the competitive performance task. The SAS-2 has reported good factorial and construct validity (Smith et al., 2006). The concentration disruption subscale also reports good internal consistency ($\alpha = .82$) and test-retest coefficients of .87. Participants reported on a 4-point Likert-scale ranging from 1 (*not at all*) to 4 (*very much so*). The concentration disruption subscale consisted of four-items and reported an excellent reliability score of $\alpha = .93$.

6.3.2.4 Golf putting performance. The competitive performance task consisted of 10 putts. The target consisted of a putting hole worth 10 points, surrounded by 4 concentric circles separated at 5 cm intervals. Each concentric circle from the centre hole was scored with 8, 6, 4, and 2 points respectively. Zero points were scored if, the ball landed outside of the outermost concentric circle or participants exceeded the 10 seconds time limit allocated to each competitive putt. A maximum of 100 points and a minimum of 0 points were available for the 10 competitive putts for each experimental condition.

6.3.2.5 Task engagement. To discern participant's motivation towards the competitive performance task, engagement was measured using a single item on a 7-point Likert scale ranging from 1 (*not at all*) to 7 (*completely*). Retrospectively participants were required to report "to what extent they were engaged in the competitive performance task".

6.3.2.6 Self-statement perception. Participants' perceptions (i.e., the helpfulness, believability, and engagement) of the self-statements were determined using three items on a 7-point Likert-scale ranging from 0 (not at all) to 7 (completely).

6.3.3 Procedure

Using a within-subjects design participants attended the lab individually on three separate occasions, first completing a baseline condition (A; no self-statements), then completing irrational (B) and rational (C) self-statement conditions in a counterbalanced design (ABC/ACB; Foley, 2004; see Figure 6.1).

6.3.3.1 Laboratory set-up. Prior to attending the lab a survey link using Qualtrics software (Copyright © 2015) was distributed via email to all participants' to collect total irrational belief scores. On arrival participants were briefed on the research protocol and the expectations of their involvement. To control for learning effects participants were first familiarised to the golf-putting task during the baseline condition.

6.3.3.2 Competitive task instructions. Competitive task instructions were first read to the participants to create a motivated performance situation (e.g., Turner et al., 2012). The instructions emphasised the task demands prior to the performance task and minimised possible reductions in task motivation and effort over successful trials (e.g., Wilson, Wood, & Vine, 2009). Specifically, the participants were informed that their scores would be compared and ranked on a publically available leader board, and the winner for each condition would be awarded a £25 cash prize (e.g., Barker, Jones, & Greenlees, 2010). The task instructions also emphasised the time-constraints, uncertainty, evaluation, and effort that would be required to complete the performance task.

6.3.3.3 Self-statements. Following the task instructions during the baseline condition, participants were asked to self-report their pre-performance anxiety and motivation towards the upcoming golf-putting task. Instead for irrational and rational self-statement conditions,

prior to completing the self-report measures participants were asked to engage with, and adopt a set of self-statements. Each set consisted of one self-statement for each of the four core beliefs central to REBT theory (Dryden & Branch, 2008). The extent to which self-statements were understandable was examined in a pilot study ($N = 8$) with minor structural and content alterations being made. Self-statements were worded in reference to the content area of 'achievement' and the competitive golf-putting task (available on request from the first author). Specifically, irrational and rational beliefs each consist of four core beliefs that are dichotomously matched and are related to a single content area (e.g., control, comfort, achievement; DiGiuseppe et al., 2014). IBs consist of the core beliefs of: demandingness (e.g., "I really would like to be successful, therefore I must"), frustration intolerance (e.g., "If I am not successful it would be intolerable"), awfulizing (e.g., "if I was not successful it would awful"), and self/other/life-downing (e.g., not being successful would make me a complete failure"). Instead, RBs consist of the four core beliefs of: preferences (e.g., "I would like to be successful, but that does not mean I have to"), anti-awfulizing (e.g., "not being successful would be bad but certainly not terrible"), frustration tolerance (e.g., although I would like to be successful, not being so would be tolerable"), and unconditional self-acceptance (e.g., not winning does not make me a complete failure, only that I have failed this time and this shows that I am a fallible human being"). To check understanding of the self-statements participants were asked to detail and summarise the content in their own words. Following this, participants then self-reported their pre-performance anxiety and motivation towards the upcoming golf-putting task.

6.3.3.4 Golf-putting performance task. After completing the questionnaires participants were instructed when to begin and that the task would end when they had played all 10 golf putts. Immediately prior to the golf-putting task participants were reminded that their performance was being video recorded and was to be evaluated by an expert golfing

coach, that they only had 10 seconds to play each putt, and that their score would be placed on leader board that was accessible to all participants. Between every two putts they were instructed to engage with the self-statements by using a cue card located next to the putting position.

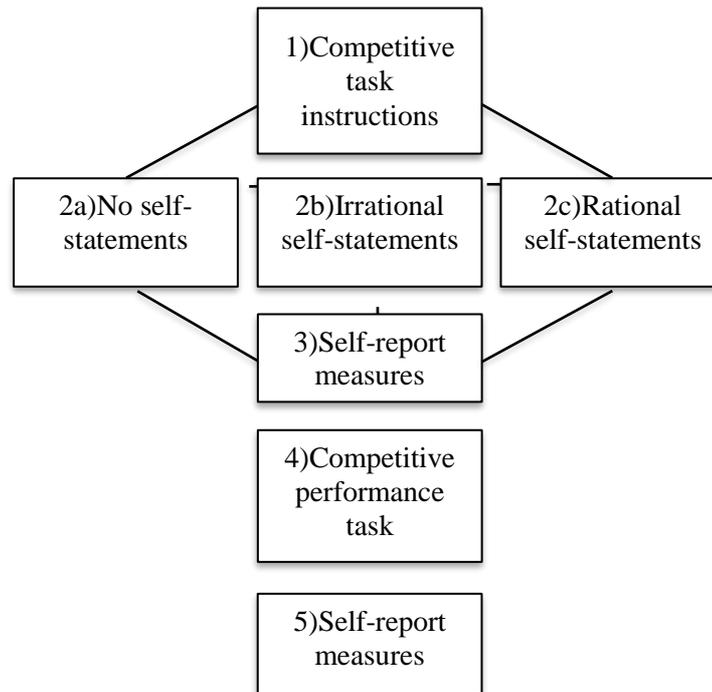


Figure 6.1 Diagrammatic representation of the data collection protocols for golf-putting task (Experiment 1), hazard perception task (Experiment 2 – phase one), and breath-holding task (Experiment 2 – phase two).

6.3.4 Data Analysis. Prior to the main analyses data screening procedures were completed. To limit the effect of outlying values, self-report data with Z score values greater than ± 3 were winsorized and replaced with the smallest or highest untrimmed score (Keselman, Algina, Lix, Wilcox, & Deering, 2008). A Shapiro-Wilks test was conducted on all data sets to test for assumptions of normality. A one-way analysis of co-variance was completed to compare the effects of irrational and rational self-statements (condition - predictor variable) with dependent variables while controlling for baseline scores (baseline

covariate) and the effects of total IBs (covariate). Tabachnick and Fidell (2013) recommended using Analysis of Covariance (ANCOVA) to examine differences in irrational and rational self-statement conditions after adjusting for the participants baseline scores and IBs. The ANCOVA ensured any post-test variance were a result of the manipulations rather than pre-test differences, and increasing the test sensitivity. Preliminary checks were conducted to ensure that there was no violation of assumptions of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate. In the instance dependent variables were correlated a multivariate analysis of covariance was performed (Mertler & Vannatta, 2002). Preliminary assumption testing was conducted to check for normality, linearity, univariate, and multivariate outliers, homogeneity of covariance matrices, multicollinearity, and no covariates were highly correlated with one another ($r > .08$). Effect size values (eta squared) were interpreted in-line with guidelines presented by Cohen, (1988): .01 = small effect, .06 = moderate effect, .14 = large effect.

6.4 Results

6.4.1 Preliminary analyses.

6.4.1.1. Manipulation checks. To test the participants understanding of the self-statements the content of the written summaries were subjectively assessed by the lead author in accordance to the four core beliefs central to REBT theory (Dryden & Branch, 2008). To test whether the participants' irrational and rational beliefs during the golf-putting task was successfully manipulated, the participants adoption of irrational and rational self-statements were examined using a single 'engagement' item on the self-statement perception scale. Statistical analysis revealed that regardless of the condition participants were engaged with the self-statements ($M = 4.44$, $SD = 1.34$), $t(69) = 27.80$, $p < .001$. In addition, statistical analysis revealed participants did not differentiate in engagement with the self-statements

between irrational ($M = 4.37, SD = 1.44$), and rational ($M = 4.51, SD = 1.25$) self-statement conditions, $F(1, 33) = .33, p = .57$.

6.4.1.2 Task engagement. The participant's engagement towards the golf-putting performance task was assessed using a single item on a self-report scale. Statistical analysis revealed that regardless of the condition participants were motivated towards the golf-putting performance ($M = 5.30, SD = .89$), $t(104) = 61.16, p < .001$. Further, participants did not differ in task engagement between baseline ($M = 5.29, SD = .83$), irrational ($M = 5.23, SD = .88$), and rational ($M = 5.37, SD = .98$) self-statement conditions, $F(2, 33) = .35, p = .71$.

6.4.2. Main analyses. Three one-way analyses of covariance were used to investigate differences in golf-putting performance, performance anxiety, and concentration disruption between irrational and rational self-statement conditions. After adjusting for baseline scores and trait IBs, analysis revealed no significant differences in putting performance $F(1, 32) = 2.27, p = .14$, Wilks' Lambda = .93, $\eta^2 = .07$, performance anxiety, $F(1, 32) = .41, p = .53$, Wilks' Lambda = .99, $\eta^2 = .01$, and concentration disruption, $F(1, 32) = .13, p = .73$, Wilks' Lambda = .99, $\eta^2 = .01$ (see Table 6.1).

Table 6.1

Mean and Change Scores ($\pm SD$) for Outcome Measures Collected in Experiment 1.

	Baseline	Irrational Self-statement		Rational Self-statement	
	Mean	Mean	Change	Mean	Change
Golf Putting Performance	57.09 (21.03)	70.06 (17.15)	11.14 (22.94)	71.37 (18.39)	14.29 (13.64)
Pre-performance Anxiety	1.61 (.36)	1.62 (.47)	.01 (.31)	1.49 (.36)	-.11 (.29)
Concentration Disruption	1.52 (.66)	1.59 (.72)	.06 (.69)	1.51 (.63)	-.01 (.54)

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

6.5 Discussion

The findings from Part I suggested the application of REBT was helpful for athletic performance, furthermore, according to REBT theory IBs should hinder performance (i.e., hindering goal achievement), while RBs should help performance. Nevertheless, research to date has not examined the precise effects of IBs and RBs on acute skilled performance as conducted in the current study. In sum, addressing aim two of the present thesis data evidenced no differences in motor skill performance, pre-performance anxiety, concentration disruption, perceived helpfulness, and believability of the statements between the irrational or rational self-statement conditions. Data do not support the study hypotheses or previous research findings (e.g., Bonadies, & Bass, 1984; Kombos et al., 1989), indicating that acute performance was not differentiated by irrational and rational approaches to a competitive task. This finding in part provides support for the postulation put forth in Part I (Chapter four), that for some a dogmatic and irrational demand for success may instead help performance. Further, participants perceived no differences in the helpfulness of irrational and rational self-statements towards the competitive golf-putting task. Nevertheless, performance outcomes alone (e.g., task score) may not fully reflect the complexity of skilled performance. For example, previous research used visual spatial tasks (e.g., mirror tracing) as a measure of performance efficiency, indicating that irrational self-talk led to reductions in performance efficiency (e.g., Bonadies & Bass, 1984; Schill et al., 1978), but not necessarily competitive performance outcomes. In contrast to previous research (e.g., Rosin & Nelson, 1983), the results also show the adoption of irrational self-statements did not determine higher levels of pre-performance anxiety or concentration disruption compared to rational self-statements. This may be explained by first, contemporary REBT theory posits healthy (e.g., concern) and unhealthy negative emotions (e.g., anxiety) are distinguished by functionality rather than the intensity (Hyland & Boduszek, 2012). Hence, it may be expected

to observe changes in functionality via the assessment of participant's perceived helpfulness of anxiety. Second, the measurement of anxiety via self-report may not accurately reflect pre-performance emotional responses due to social desirability (e.g., Williams & Krane, 1992), thus more objective markers are warranted. Previous research has evidenced greater physiological arousal (measured via Galvanic Skin Response) when adopting irrational self-statements compared to rational self-statements (e.g., Master & Gershman, 1983). Therefore, objective markers of physiological arousal may yield more accurate findings. Accordingly, further addressing aim two of the present thesis, in Experiment 2 a more refined and detailed investigation into the precise influence of irrational and rational self-statements across various physiological outcomes, and performance indicators was conducted (e.g., efficiency, task persistence, objective outcomes).

6.6 Experiment 2

In Experiment 2 the effects of irrational and rational self-statements on measures of performance efficiency and effectiveness, task persistence, and competitive task performance outcomes were examined. Extending the findings from Experiment 1 that measured task performance outcomes only, in Experiment 2 visual gaze behaviour (measuring performance efficiency and effectiveness) was measured during a competitive Hazard Perception Task (HPT; phase one) and persistence during a Breath Holding Task (BHT; phase two). In-line with Experiment 1, pre-performance anxiety and concentration disruption were measured. Further building on Experiment 1, heart rate and perceived helpfulness of anxiety were also measured to provide an objective measure of physiological arousal and a directional measure of pre-performance anxiety respectively.

According to the processing efficiency theory (PET; Eysenck & Calvo, 1992) emotions such as anxiety may take up available processing resources in the working memory, in turn hindering performance efficiency. However, decrements in efficiency may not be

reflected in performance outcomes (e.g., task score), as performance can be maintained (Wilson, Smith, Chattington, Ford, & Marple-Horvat, 2006). Using a hazard perception task, previous research has evidenced a quicker ability to fixate on a hazard after its appearance underpins hazard perception performance (Crundall et al., 2012). In addition, researchers have also shown an increase in fixation duration to a detected hazard is also indicative of performance effectiveness and increased attentional capture (Garrison & Williams, 2013). Moving beyond Experiment 1, this was the first study to use markers of visual search behaviour as an objective measure of performance efficiency and effectiveness, thus providing a rich dynamic source of psychological processes during the competitive hazard perception task (Richardson & Spivey, 2004).

Past laboratory research (e.g., Rosin & Nelson, 1983) indicated no differences in task persistence between irrational and rational self-statements. However, researchers suggest that IBs may be acutely motivational on the approach to an important competitive event, and therefore may lead to greater persistence (Turner, 2016). Further, REBT practitioners have indicated that IBs such as “I must succeed” may be considered motivational by performers (Turner & Barker, 2014a). Therefore in Experiment 2, alongside measuring participants perceived mental effort, a Breath Holding Task (Hajek, Belcher, & Stapleton, 1987) was used as a raw measure of task persistence whilst tolerating discomfort (e.g., Sütterlin et al., 2013).

Drawing on the aforementioned literature a series of hypotheses were proposed for Experiment 2. First, participants using irrational self-statements would record reduced performance efficiency, in terms of decreases in both fixation durations to the detected hazard and ability to fixate on the hazard after its appearance (i.e., time elapsed between hazard appearance and first hazard fixation; Crundall et al., 2012). Second, participants would record worse performance outcomes (hazard perception score) when adopting irrational self-statements compared to rational self-statements. Finally, participants who

adopted irrational self-statements would also record greater task persistence, greater mental effort, higher anxiety intensity, lower perceived helpfulness, and increased physiological arousal (i.e., increased heart rate) compared to when using rational self-statements.

6.7 Method

6.7.1 Participants.

As in Experiment 1, the effect sizes reported in research similar to the present study (e.g., Williams & Cumming, 2012; Wilson et al., 2006) reinforced the expectation for medium effects. Based upon an a priori power analysis, 35 undergraduates (26 = Male, 9 = Female) were purposively recruited at a UK university and were aged between 18 and 30 years ($M_{age} = 21.09$, $SD_{age} = 2.92$). All held a full UK driving license and had been driving for a minimum of 6-months. None of the participants had visual or hearing impairments that impeded their ability to complete the tasks. Institutional ethical approval and participant consent was obtained prior to all data collection (see Appendix 6.7).

6.7.2 Measures. As used in Experiment 1, measures of trait IBs were collected using the SGABS ($\alpha = .84$).

6.7.2.1 Pre-performance anxiety. To ascertain levels of pre-performance anxiety and reduce completion time the STAI was reduced from 20 to 10 items. These 10 items were selected based upon the best psychometric properties within the State Trait Anxiety Inventory (STAI Form Y; Spielberger, 1983) as validated within the State Trait Personality Inventory (STPI; Spielberger & Reheiser, 2009). The 10 trait anxiety items within the STPI has a high test-retest reliability ($r = .76 - .86$), Cronbach's alpha coefficient ($\alpha = .90$), content, construct and concurrent validity (Spielberger & Reheiser, 2009). A Cronbach's alpha coefficient reported excellent internal reliability ($\alpha = .90$). Participants also reported on a 7-point Likert-scale ranging from -3 (*Not at all helpful*) to 3 (*Extremely Helpful*) the directional interpretation of their pre-performance anxiety in relation to the upcoming competitive task.

6.7.2.2 Physiological arousal. Participants heart rate were measured using a MP45 Biopac (Biopac Systems Inc. 2016) to provide an objective and accurate assessment of physiological arousal on approach to both competitive performance tasks (HPT and BHT). A Biopac Analysis software (Biopac Systems Inc. 2016) ascertained changes in heart rate scores between baseline phase (after receiving the self-statements and before the pre-performance preparation phase) and pre-performance preparation phase (between starting pre-performance preparation and immediately prior to beginning the task).

6.7.2.3 Hazard perception performance. A HPT provided an objective measure of task performance (i.e., response time), specifically measuring participants' ability to quickly perceive and respond to a potentially dangerous driving situation (Wood, Hartley, Furley, & Wilson, 2016). Hazard perception scores were marked out of 20 and measured using response times (milliseconds) between the onset of the hazard and when the participant indicated the presence of a hazard (mouse click). Participants were provided with a window of 5000 milliseconds and in the instance a click was not registered 0 points were awarded. Scores from each clip were summed to produce a final performance score. Hazard perception performance was assessed using three hazard perception clips each containing one major developing hazard - lasting between 55 and 60 seconds. Each clip was: specific to driving, featured everyday road scenes, contained one developing major hazard, and was fully counterbalanced between conditions.

6.7.2.4 Eye tracking and fixation analyses. Participants' visual search behaviour during the appearance of the major hazard provided an objective indicator of performance efficiency and effectiveness (Garrison & Williams, 2013). First, fixation duration to the detected hazard was measured as an indicator of attentional capture and a predictor of effective hazard perception performance (Wood et al., 2016). Specifically, fixation duration was calculated as a change score of mean fixation duration between the baseline phase (total

clip length prior to onset of the major hazard) and during the presence of the major hazard. Mean scores were calculated across three hazard perception clips. In addition, the time taken to fixate on the major hazard after its appearance was measured as an indicator of performance efficiency and predictor of effective hazard perception performance (Crundall et al., 2012). Time taken to fixate on the hazard was calculated as a mean time elapsed between the appearance of the major hazard and time of first fixation towards the hazard location (milliseconds). A fixation was defined as a gaze that remained on a single location for longer than 100ms and the frequency of the gaze was calculated as the mean number of times a location was fixated on (milliseconds; Garrison & Williams, 2013). SR Research Ltd. Experiment Builder software (Copyright 2016) monitored patterns of visual gaze behaviour via the Eye Link 1000 sampling at a rate of 2000 Hz that recorded monocular gaze direction with an accuracy of 0.25 – 0.5 degrees.

6.7.2.5 Breath-holding task. The BHT (Hajek, Belcher, & Stapleton, 1987) provided a behavioural indicator of task persistence whilst tolerating discomfort (e.g., Sütterlin et al., 2013); and a good test-retest reliability ($r = .67$; Sutterlin et al., 2013). Breath holding performance scores were measured in seconds from when the participant initiated the first inhalation until the first exhalation. Participants were asked to “hold their breathe for as long as possible”. Participants’ compliance with the BHT was measured on a 9-point Likert-scale (a) to what degree they followed the instructions precisely, (b) to what degree they tried to hold their breath as much as possible, and (c) whether they could hold their breath for any longer (Sütterlin et al., 2013).

6.7.2.6 Perceived mental effort. The Rating Scale Mental Effort (RSME; Zijlstra, 1993) provided a validated uni-dimensional measure of mental effort. The scale has robust psychometric properties and undertaken extensive validation across a range of settings (Zijlstra, 1993). The RSME has shown good reliability across laboratory ($r = .88$) and real-

life settings (work; $r = .78$; Wilson et al., 2006). After the completion of both HPT and BHT participants were required to indicate on a continuous vertical scale the amount of mental effort invested within the task. The scale consists of anchor points ranging from 0 (*Absolutely no effort*), 75 (*moderately effortful*) to 150 (*Extreme effort*).

6.7.2.7 Manipulation checks and task engagement. As in Experiment 1, perceptions of self-statements were collected in reference to both HPT and BHT. Furthermore, Participants' motivation towards both competitive performance tasks was measured using a single item. In-line with previous research increases in heart rate were also measured using MP45 Biopac (Biopac Systems Inc. 2016) to provide an objective indicator of participant's engagement with the HPT (e.g., Turner et al., 2012).

6.7.3 Procedure. As in Experiment 1, measures of total IBs were collected prior to arrival. Using a within-subjects design participants then attended the lab individually on three separate occasions in a counterbalanced design (ABC/ACB; Foley, 2004). Experiment 2 spanned two phases with the study procedure repeated for both the HPT (phase one) and BHT (phase two) in one testing session (see Figure 6.1). Data collection was completed using a combination of on-screen instructions and verbal cues from the researcher (Lead author). Psychological data were collected using an external laptop positioned in close proximity to the participants seating position. Using the Biopac software participants were fitted with electrodes to continuously monitor participants' heart rate(s) throughout the entirety of Experiment 2.

6.7.3.1 Phase one. On arrival participants were calibrated to the eye tracker using a 9-point grid displayed on the computer screen. Once calibrated, participants were provided with on screen instructions and a familiarisation hazard perception clip. The provision of self-statements or no self-statements followed the procedures used in Experiment 1. Participants, were asked to summarise the content of the self-statements in the their own words before

self-reporting the intensity and perceived helpfulness of their pre-performance anxiety, as well as their motivation towards the upcoming task. Prior to the HPT participants were asked to take a few moments to re-familiarise and engage with the given set of self-statements, or to think (baseline) and prepare themselves for the upcoming performance (specific instructions available from the first author). Immediately prior to and between each of the three randomised hazard perception clips participants were re-calibrated using drift correct measures. On completion, participants remained connected to the MP45 Biopac to monitor heart rate(s) before proceeding to phase two.

6.7.3.2 Phase two. As in phase one, participants were asked to read a new set of competitive instructions regarding the BHT and provided with verbal instructions on how to complete a BHT. Specifically, participants were asked to sit comfortably on a chair, to pinch their nose, and asked to hold their breath for as long as possible, even if they felt the urge to breathe again (Sütterlin et al., 2013). Once familiarised and practiced with this technique the participant was provided and asked to adopt self-statements that were tailored to their performance in the BHT. As used in phase one, participants then completed a series of self-report measures before taking a moment to re-familiarise and engage with the self-statements and prepare for the BHT. At the end, participants were asked to complete measures of perceived mental effort and compliance with the BHT. Additionally, in reference to both the hazard perception and breath-holding task participants self-reported their perceptions of the self-statements.

6.7.3 Data analysis. The statistical analysis procedures followed in Experiment 1 were also used in this experiment.

6.8 Results

6.8.1 Preliminary analyses

6.8.1.1 Manipulations check. All 35 participants indicated successful understanding of the self-statements. In reference to both hazard perception and breath-holding tasks, statistical analysis revealed regardless of the condition participants were equally engaged with the self-statements ($M = 4.37$, $SD = 1.64$), $t(69) = 22.26$, $p < .001$. Analysis also indicated engagement with the self-statements did not differ between irrational and rational self-statement conditions after controlling for trait IBs, $F(1, 33) = 2.84$, $p = .10$.

6.8.1.2 Task engagement. As in Experiment 1, statistical analysis was conducted to test participant's motivation towards both hazard perception and breath-holding tasks using a single self-report item. Analysis of self-report data revealed regardless of the condition participants were engaged with both the HPT ($M = 5.23$, $SD = .97$), $t(104) = 55.05$, $p < .001$ and BHT ($M = 5.07$, $SD = 1.32$), $t(104) = 39.41$, $p < .001$. Furthermore, analysis indicated engagement with the self-statements did not differentiate between baseline, irrational, and rational self-statement conditions in both HPT, $F(2, 33) = .22$, $p = .81$ and BHT, $F(2, 33) = .415$, $p = .66$. Statistical analysis also revealed regardless of the condition participants were engaged with the HPT, as indicated by mean increases in heart rate scores ($M = 2.67$, $SD = 4.91$), $t(104) = 5.58$, $p < .001$. In addition, participants did not differentiate in heart rate increases between baseline ($M = 3.06$, $SD = 5.69$), irrational ($M = 2.35$, $SD = 4.39$), and rational self-statement conditions ($M = 2.61$, $SD = 4.68$), $F(2, 33) = .20$, $p = .82$. Statistical analysis showed regardless of the condition participants reported compliance with the BHT, as indicated by three items on a BHT compliance measure ($M = 6.28$, $SD = 1.46$), $t(104) = 44.08$, $p < .001$. Furthermore, analysis indicated participants did not differ in BHT compliance between baseline ($M = 6.11$, $SD = 1.56$), irrational ($M = 6.35$, $SD = 1.56$), and rational self-statement conditions ($M = 6.39$, $SD = 1.29$), $F(2, 33) = .86$, $p = .68$.

6.8.2 Main analyses. The main analyses are presented in three sections. The effects of irrational and rational self-statements on outcomes measures are reported in reference to

the modified HPT and BHT in the first two sections (see Table 6.2). The final section reports participant's perceptions of helpfulness and believability of the self-statements between irrational and rational conditions.

6.8.3 Hazard perception task.

6.8.3.1 Hazard perception performance. To test the effects of irrational and rational self-statements on hazard perception performance a one-way analysis of covariance was conducted. Statistical analysis reported no significant differences between irrational and rational self-statement conditions after controlling for trait IBs and baseline scores, $F(1, 32) = .94, p = .18, \eta^2 = .06$.

6.8.3.2 Visual gaze behavior. To examine the effects of irrational and rational self-statements on participant's performance efficiency, after adjusting for baseline and trait IBs two one-way analyses of covariance were conducted. Analysis revealed no significant main effects between self-statement conditions in mean fixation duration during the presence of the major hazard, $F(1, 32) = .58, p = .45, \eta^2 = .02$. Further statistical analysis also revealed no significant differences in time taken to first fixation of the major hazard, $F(1, 32) = .59, p = .45, \eta^2 = .02$.

6.8.3.3 Pre-performance anxiety. Two one-way analyses of covariance were used to investigate differences in the intensity and the directional interpretation of pre-performance anxiety between irrational and rational self-statement conditions prior to the HPT. After controlling for trait IBs and baseline scores analysis revealed no significant differences in intensity, $F(1, 32) = .08, p = .78, \text{Wilks' Lambda} = .99, \eta^2 = .00$, the directional interpretation of pre-performance anxiety, $F(1, 32) = .62, p = .44, \text{Wilks' Lambda} = .98, \eta^2 = .02$.

6.8.3.4 Physiological arousal. To examine the effects of irrational and rational self-statements on participant's physiological arousal a one-way analysis of covariance was

conducted. No significant effects were found in heart rate between conditions after controlling for trait IBs and baseline scores, $F(1, 32) = 1.82, p = .67, \eta^2 = .01$.

6.8.4 Breath-holding task.

6.8.4.1 Task persistence and perceived mental effort. Two one-way analyses of covariance were used to examine differences in task persistence and perceived mental effort between irrational and rational self-statement conditions during a BHT. After controlling for trait IBs and baseline scores analysis revealed no significant differences in task persistence $F(1, 32) = 1.63, p = .21$, Wilks' Lambda = .95, $\eta^2 = .05$, and perceived mental effort $F(1, 32) = 3.81, p = .06$, Wilks' Lambda = .89, $\eta^2 = .11$,

6.8.4.2 Pre-performance anxiety. Two one-way analyses of covariance were used to investigate differences in the intensity and the directional interpretation of their pre-performance anxiety between irrational and rational self-statement conditions prior to the BHT. After adjusting for trait IBs and baseline scores analysis revealed no significant differences in intensity, $F(1, 32) = .31, p = .58$, Wilks' Lambda = .99, $\eta^2 = .01$, the directional interpretation of pre-performance anxiety, $F(1, 32) = .56, p = .46$, Wilks' Lambda = .98, $\eta^2 = .02$.

6.8.4.3 Physiological arousal. To examine the effects of irrational and rational self-statements on changes in physiological arousal, as measured by changes in heart rate a one-way analysis of co-variance was conducted. After controlling for total irrational belief scores and baseline scores, analysis revealed no main effects between irrational and rational self-statement conditions, $F(1, 32) = 1.67, p = .21, \eta^2 = .05$.

6.8.4.4 Self-statement perception. Statistical analysis was conducted to examine participants perceived helpfulness of the self-statements between irrational and rational conditions for both the hazard perception and breath-holding task. After controlling for total irrational belief scores, a one way analysis of co-variance reported no significant effect in

perceived helpfulness for both HPT, $F(1, 33) = 2.41, p = .13, \eta^2 = .07$, and the BHT, $F(1, 33) = 1.86, p = .18, \eta^2 = .05$. The results indicate irrespective of the condition participants reported no difference in perceived helpfulness between the rational self-statements (RSS) and irrational self-statements (ISS) for both the HPT (RSS - $M = 4.83, SD = 1.40$; ISS - $M = 3.46, SD = 1.82$) and BHT (RSS - $M = 4.86, SD = 1.48$; ISS - $M = 3.77, SD = 1.94$). In reference to both hazard perception and BHT a one-way analysis of covariance reported significant differences in the believability of self-statements between irrational ($M = 3.74, SD = 1.82$) and rational self-statements ($M = 5.17, SD = 1.48$) after controlling for trait IBs, $F(1, 33) = 1.66, p = .21, \eta^2 = .05$.

Table 6.2

Mean and Change Scores (\pm SD) for Outcome Measures Collected in Experiment 2.

	Baseline	Irrational Self-statement		Rational Self-statement	
	Mean	Mean	Change	Mean	Change
Hazard Perception Task (Experiment 2)					
Hazard perception performance	30.03 (12.17)	26.63 (10.41)	-3.40 (16.04)	30.40 (10.48)	.37 (17.24)
Gaze data: Mean fixation duration on the hazard (ms)	10.79 (24.12)	11.15 (27.05)	.36 (29.48)	19.68 (20.50)	8.90 (28.18)
Gaze data: Time to fixate the hazard (ms)	375.22 (299.68)	370.83 (276.89)	-4.40 (253.21)	491.20 (369.09)	115.98 (488.14)
Pre-performance anxiety: Intensity	.92 (.60)	.80 (.67)	-.11 (.48)	.66 (.55)	-.26 (.38)
Pre-performance anxiety: Perceived helpfulness	.91 (1.22)	1.26 (1.20)	.34 (1.21)	1.51 (.82)	.60 (1.09)
Physiological arousal (change scores; HR)	3.06 (5.69)	2.35 (4.39)	-.72 (6.59)	2.61 (2.49)	-.46 (7.24)
Breath Holding Task (Experiment 2)					
Task persistence (seconds)	48.22 (15.40)	52.14 (16.55)	3.92 (11.60)	51.67 (16.78)	3.45 (13.73)
Perceived mental effort	96.11 (27.89)	102.09 (28.94)	5.97 (26.43)	98.26 (21.46)	2.14 (26.79)
Pre-performance anxiety: Intensity	1.04 (.70)	.91 (.67)	-.13 (.51)	.79 (.59)	-.25 (.55)
Pre-performance anxiety: Perceived helpfulness	1.00 (1.55)	.74 (1.54)	-.26 (1.24)	1.11 (1.08)	.11 (1.45)
Physiological arousal (change scores; HR)	3.96 (7.90)	4.96 (6.54)	1.00 (9.66)	4.53 (4.84)	.56 (9.70)

6.9 Discussion

In-line with thesis aim two, in Experiment 2 the findings from Experiment 1 were extended by assessing the effects of irrational and rational self-statements on objective measures of performance and performance efficiency during a competitive hazard perception task; as well task persistence during a breath-holding task. Again, contrasting with REBT theory and the findings put forth in Part I, the data in Experiment 2 indicate no differences in competitive performance, performance efficiency, task persistence, mental effort, pre-performance anxiety and physiological arousal between irrational and rational self-statement conditions.

REBT theory indicates the endorsement of RBs is unhelpful, whereas IBs hinder performance (Dryden & Branch, 2008). In Experiment 2 both fixation duration to detected hazard and time taken to fixate on the major hazard were assessed as objective and sensitive indicators of performance efficiency predictive of hazard perception performance (G. Wood et al., 2016). The present findings indicate no differences in performance effectiveness and efficiency between irrational and rational self-statement groups and accordingly support the results of Experiment 1, whilst contrasting with data from previous studies (e.g., Bonadies & Bass, 1984; Kombos et al., 1989; Schill et al., 1978). To further understand the effects of beliefs Turner and Barker (2014) suggested when encountering adversity (i.e., sporting competition) IBs may harbour motivational qualities. However, in-line with previous research (e.g., Rosin & Nelson, 1983) both task persistence and perceived mental effort were not differentiated by either an irrational and rational approach towards a competitive task. In contrast to previous studies the findings suggest IBs did not enhance self-reported pre-performance anxiety (e.g., Rosin & Nelson, 1983) or lead to higher levels of physiological arousal (e.g., Master & Gershman, 1983) when approaching the competitive hazard perception or breath-holding task. Furthermore, an irrational or rational approach did not

determine differences in the perceived helpfulness of the pre-performance anxiety. Notably however, significant differences were recorded in the believability between the self-statement groups with participants reporting irrational self-statements to be less believable compared to rational alternatives.

6.10 General Discussion

In-line with the thesis aim two, in Chapter 6 the effects of irrational and rational self-statements on acute performance, as well as important psychological outcomes previously associated with performance were investigated. The study findings disconfirmed the study hypotheses, challenging previous research that indicated irrational self-statements were associated with reduced task performance (e.g., Bonadies & Bass, 1984; Schill et al., 1978). In addition, the results challenge predictions of REBT theory that IBs hinder, whereas RBs are helpful towards performance. There exists a plethora of research supporting the detrimental effects of IBs on psychological health (David et al., 2005; Visla et al., 2016) that have also been supported in the context of elite sport (e.g., emotional and physical exhaustion; Turner & Moore, 2015). In contrast to the postulations put forth in Part I whereby reductions in IBs brought around by REBT were associated with outcomes indicative of enhanced performance; in Part II participants did not differ in behavioural performance (i.e., golf-putting performance) and performance efficiency (i.e., eye gaze data) when adopting an irrational and rational approach towards a real-life competitive task. Indeed, REBT theory only posits IBs to be associated with maladaptive behaviours common in clinical settings (e.g., increased anger, self-harming, procrastination; Dryden & Branch, 2008). In addition, previous research examining the effects of irrational self-statements on behaviour is scant and fraught with methodological shortcomings. Ultimately, evidence supporting the adverse effects of IBs on performance is meagre, thus, the notion that for some IBs may enhance performance is one that should be seriously considered.

Contrary to previous research (e.g., Rosin & Nelson, 1983) no differences were reported in pre-performance anxiety, perceived helpfulness of pre-performance anxiety, and accordingly no differences were reported in concentration disruption. Acknowledging the limitations of self-report measures (Williams & Krane, 1992), and in-line with previous research (e.g., Harris et al., 2006) objective measures of physiological arousal were used in the present study. Whilst increases in heart rate suggested participants were engaged with the competitive task, results suggest participants did not differ in physiological arousal when adopting irrational and rational self-statement conditions.

Researchers proposed IBs may harbour motivational qualities (Turner & Barker, 2014a), subsequently encouraging perseverance in the face of hedonic costs in an attempt to realise long-term ambitions, certainly an important component of adaptive functioning (Williams & DeSteno, 2008). However, in-line with previous research (e.g., Rosin & Nelson, 1983) the results indicated no differences in task persistence or perceived mental effort between a rational and irrational approach to a competitive performance. Offering a nuanced view researchers have proposed irrational and RBs may differ in the quality of motivation rather than the intensity. The core irrational belief of demandingness (e.g., should, must) has been compared to introjected regulation where actions are self-imposed in an attempt to avoid shame, guilt, and ego enhancement underpinned by the sense they “should” take part. Introjected regulation has been associated with expending greater effort, yet it is also related to higher anxiety, and reduced ability to cope with failure (Turner, 2016). The effects of IBs and/or RBs on motivational quality may offer further insight into the precise effects on performance and warrants further investigation.

Based on the findings it was suggested for some IBs may be helpful towards performance. Considering the findings from Part I it would be important to understand why there has been disparity between applied (Part I) and experimental (Part II) research when

investigating the effects of IBs and RBs. In addition, seeing the prevalence of mental health disorders in performance contexts such as elite sport (Hughes & Leavey, 2012), ethically practitioners would not encourage the adoption of IBs in the pursuit of performance excellence.

The study findings provide no evidence exists to suggest IBs offer advantages above that of RBs. Where instead a less polarised view as to the effects of irrational and RBs on performance was put forth, acknowledging that for some thinking irrationally may be advantageous in the pursuit of short-term goals, yet detrimental for ones' psychological health in the long-term. Whilst previously overlooked, REBT theory itself may provide an insight into the paradoxical effects of IBs on psychological well-being and performance. Specifically, although RBs are categorised as empirically true, logical, and pragmatic (i.e., helpful; Diguseppe et al., 2014) REBT theorists have ignored the proposition that IBs can deny all logic and empirical arguments yet serve a helpful role towards goal achievement (Wilson, 2010). Furthermore, the view that IBs are wholly detrimental is challenged by the notion that human's beliefs have developed with evolutionary design in response to their environment (Pelusi, 2003). Thus, serving adaptive functions for our ancestors, where the extreme, dogmatic, and drastic responses would have ensured favourable outcomes were met. Most recently Turner (2016) has put forth the notion of 'double-thinking' that denotes irrational and RBs can exist simultaneously in a transient and stable form. Originally proposed by George Orwell (Orwell, 1949), double thinking is based on the premise that humans are able to hold two contradictory beliefs in one's mind simultaneously whilst accepting both of them. An athlete maybe able to forget any fact or belief that has become inconvenient and to then only draw it back only when it is needed. For example, an endurance runner may harbour RBs about adversity that ensure psychological health, yet

during the final sections of a race irrational self-talk (e.g., “I must finish, otherwise it would be terrible”) may facilitate goal achievement.

6.10.1 Limitations and future directions.

It is important to understand the results in terms of its limitations and offer recommendations for future research within REBT and performance. In Part II the effects of irrational and rational self-statements rather than core beliefs were investigated in lab-based settings. In both Experiment 1 and 2 methodological and measurement efforts were made to ascertain sufficient task engagement and manipulation checks. Nevertheless, the findings from the present study indicate it may be difficult to engender irrational and rational beliefs within experimental settings and using a novel task. While both self-report and objective measures of heart rate were used to confirm participant’s engagement with the study manipulations the content of self-statements were not tailored to irrational and RBs pertinent to the participants. As such to enhance the internal validity of future studies may wish to screen and split participants who hold high and low irrational beliefs about meaningful performance tasks within ecological valid settings. To also offer a more sensitive and accurate examination, future researchers may also wish to tailor core beliefs relevant to the participant, as well favour the use of objective measures (i.e., pupil dilation as a measure of mental effort; Wood et al., 2016).

Due to recruitment and temporal constraints within the research process, the present study failed to recruit 51 participants within each group and achieve statistical power, as such the study conclusions should be tempered accordingly. In contrast to Part I, greater methodological rigor and control was given to the data collection process and reduced threats to internal validity. With this came the compromise of reducing the external validity of the findings in terms of individuals (i.e., undergraduate university students) and ecological validity (i.e., lab- setting). Future researchers may attempt to conduct applied field-based

studies participant's representative of elite athletes. In the present studies, the SGABS provided a reliable and validated measure of total general irrational belief scores. However, future researchers would be prudent to adopt a newly validated measure of IBs tailored for performance contexts, named the irrational Performance Beliefs Inventory (iPBI; Turner et al., 2016) to provide an accurate measure of performance specific beliefs. RBs and IBs are proposed to be dichotomous constructs, whereby low levels in one does not necessarily indicate high levels in the other (Bernard, 1998). Future researchers may wish to explore the interplay between irrational and rational beliefs, and the subsequent effects on performance. Research within REBT proposes a unitary model of emotion that are quantitatively distinct (i.e., high vs. low anxiety) and a binary model of emotion that are qualitatively distinct (i.e., anxiety vs. concern; Hyland & Boduszek, 2012). To this end, future researchers are recommended to establish a validated and reliable measure of emotion sensitive to measuring both the functionality and intensity. The precise mechanisms by which irrational and rational beliefs effect performance appear to be more complicated than previously hypothesised, therefore future researchers may wish to explore role of important psychological factors (e.g., self-efficacy) that may mediate the association between beliefs and performance.

6.10.2 Conclusion.

Building on Part I and addressing aim two of the present thesis, in Part II the effects of irrational and rational self-statements were examined on objective markers of performance (e.g., golf-putting, hazard perception score, eye gaze data), pre-performance anxiety, concentration disruption, and physiological arousal (e.g., changes in heart rate). The findings however contrast with previous research indicating that the adoption of irrational self-statements did not lead to adverse effects on performance, performance efficiency, persistence, and psychological outcomes above that of rational self-statements. This said, in-line with social validation put forth in Part I, the present findings showed no significant

differences in task persistence. Indirectly suggesting those who endorse IBs are not better able to tolerate discomfort and/or expended greater effort; alternatively, researchers (Turner, 2016) hypothesised distinctions in the quality of motivation. Challenging a polarised view of irrational and rational beliefs towards performance, individual (e.g., self-efficacy, cognitive dissonance) and contextual factors may instead dictate the precise effects of beliefs on emotional, behavioural, and performance consequences. As well, IBs may have both positive and negative effects on performance, highlighting distinctions in both factual and practical rationality that have been overlooked within the literature. The detrimental effects of IBs for psychological health are established, accordingly understanding the precise effects and mechanisms by which irrational and rational beliefs effects ones ability to perform has valuable implications for practitioners utilising REBT within high performance contexts.

Chapter 7

Applying Rational Emotive Behaviour Therapy in Elite Sport: A Reflective Layered Account

7.1 Introduction

Within Chapters three, four, and five the effects of REBT have been examined on important psychological (e.g., self-efficacy, perception of control, achievement orientation, pre-performance anxiety), physiological (systolic and diastolic blood pressure), as well as markers and actual performance scores. In-line with aim three the application of REBT has been examined (i.e., single-case, pre/post-test cross over design) using one-to-one and workshop formats within a specialised sample of elite able-bodied and Paralympic athletes within ecologically valid settings. In sum, collectively the findings have theoretical implications suggesting that IBs determine an unhealthy emotional and maladaptive behavioural response that hinders performance. In turn, offering applied implications for practitioners and contributing the emerging evidence base (e.g., Turner & Barker, 2014a; Turner, 2016) that demonstrates REBT as a valuable and promising intervention that not only facilitates psychological health, but may also have performance enhancing effects.

7.2 Rationale and Structure.

Given the recent emergence of REBT research in sport there exists a dearth of professional practice literature that elaborates and disseminates the nuances of applying REBT with elite athletes (e.g., Turner & Barker, 2014a), and more broadly performance contexts. The application of clinical models are emerging and garnering attention within the sport psychology literature. For example, over the past decade techniques such as, REBT, mindfulness, acceptance based models (e.g., Gardner & Moore, 2012), and emotional freedom techniques (e.g., Rotheram et al., 2012) have been introduced as an approach to enhance athletic performance and the overall psychological well-being of athletes. REBT proposes that individual's beliefs (rational versus irrational) are associated with emotions and

action tendencies that are divergent in their functionality (functional versus dysfunctional) towards goal achievement. To a reader REBT is logical and linear within its formulation, (Dryden & Neenan, 2015). However, unlike various psychological skills commonly used in sport psychology, it is not simply a ‘technique’ but an approach. The effective application can be complicated and much better delivered with a thorough understanding of REBT theory and considerable reflective practice over time. Andersen (2000) highlighted the need to document real-life consultancy issues encountered by practitioners to help develop future application. Barker et al., (2013) also highlight the paucity of research and professional practice literature within specialised populations such as elite athletes with a disability.

Moving beyond Chapters three, four, and five, in the current chapter a reflective account outlines 1) professional practice insights into the effective application of REBT with elite athletes, and 2) provides reflections on working with elite Paralympic athletes. Salient themes were selected upon my experiences and/or critical moments that were proposed to glean meaningful professional practice insights. Each salient theme was constructed on the process of recall and reflective diary entries completed over the course of Chapters three – five. Each theme was layered with a theoretical narrative that made sense of the given theme in reference to the literature. This layered account allowed the author to document the applied challenges, experiences, and learning that is typically not afforded for elaboration in usual channels of scientific dissemination (Richardson, 1994). Furthermore, reflective practice is an important element of applied work when evaluating and documenting intervention effects that provides a rich source of information for practicing psychologists (Anderson, Knowles, & Gilbourne, 2004). Throughout the entirety of the programme of research the primary author (Andrew Wood) was undertaking a qualification to become a sport and exercise psychologist within the Division of Sport and Exercise Psychology.

7.3 Applying REBT with Elite Athletes

7.3.1 From psychotherapy to psychological skills training. During my time with the elite Paralympic athletes I visited the national centre of sport once a week working closely with the lead sport psychologist. Prior to delivering the intervention I was made aware that two participants had previously experienced clinical psychological issues. At the onset of the intervention with both athletes I outlined the session aims managing the athlete's expectations that this was to be a performance focused intervention. As the sessions progressed it became apparent that athlete's history, personal lives, and performance environments were inextricably linked. Furthermore, the ABC (DE) model requires athletes to draw upon the most recent or poignant adversities. Despite reiterating a focus on performance, a wide range of adversities were covered, spanning both personal and sporting lives.

Prior to and during the delivery of REBT with both athletes I felt a sense of uneasiness and heightened cautiousness. Knowing that REBT was traditionally a clinical psychological therapy to treat disturbances in clinical settings I was conscious to negate addressing issues beyond the realms of my professional competence (i.e., clinical issues). This sense of uneasiness continued as I orientated myself between the spectrum of mental skills training and therapy. To ensure clarity regarding my professional boundaries I re-familiarised myself with the British Psychological Society (BPS) code of ethics. Specifically, referring to 'competence' – that ensures I work optimally within the limits of my knowledge, skill, training, education and experience. I felt this was an appropriate step to take that both reinforced and similarly settled my initial concerns.

REBT in sport occupies a chasm between therapy and mental skills coach, and although I feel apt in the application of REBT I lack the knowledge and experience of

working with clinical issues. It is important for practitioners to understand and be sensitive to the somewhat blurry lines of professional competence, especially when applying REBT to enhance performance (Roberts, Faull, & Tod, 2016). With the increasing influx of psychological approaches utilised in sport practitioners are required to exercise understanding of their professional and ethical boundaries; that is, understanding the distinction between nonclinical (i.e., performance), sub clinical, and clinical issues (Gardner & Moore, 2006). I believe it would be unethical and irresponsible for sport psychologists to use REBT in an attempt to treat clinical issues presented by their client without the appropriate training and knowledge of the presenting issue. Whereby, ethical and professional considerations are proposed to be determined by the treatment goals, severity of mental health, and ethical responsibilities (Herzog & Hays, 2012).

7.3.2 Benefits of delivering REBT as a group workshop. Previous researchers have suggested REBT is best delivered on a one-to-one basis (Turner & Barker, 2014a). Sport psychologists are expected to demonstrate impact with athletes whilst working under limited and sporadic time constraints, therefore, it was important to examine the effects of REBT using a variety of modalities. During the applied research I conducted in Chapters three, four, and five I transitioned from a comprehensive one-to-one application towards a workshop-based modality. In Chapter three I was afforded an extensive period of time with the client that allowed me draw heavily on REBT that was underpinned by a humanistic person centred approach (Rogers & Sanford, 1984). Chapter four using a shortened one-to-one modality consisting of five, 30-minute one-to-one sessions. Within Chapter five I delivered a single REBT educational workshop, lasting for 60 minutes.

Looking back I can recall the sense of accomplishment I felt after applying REBT on a one-to-one basis. On the contrary, after delivering the workshop REBT session I felt hopeful that the key concepts seemed to resonate well with the athletes, however,

disheartened and frustrated that the players were only able to receive a single session. The athletes were left with a superficial understanding of REBT, whereas the one-to-one sessions allowed me to work collaboratively through the ABC (DE) model with direction and flexibility, that instilled a sense of autonomy over their emotions and actions when encountering adversity.

I believe my frustrations stem largely from my experiences of applying sport psychology to date. A single workshop may not be sufficient for long-term fundamental changes (e.g., Turner et al., 2014). Indeed, REBT is more than a one-time exercise and the benefits are effected by greater exposure to the ABC (DE) model (MacInnes, 2004). There are some who work in elite sport who assume psychologists provide a magic bullet, taking a reactive and problem focussed approach whilst failing to acknowledge the need for a proactive and performance focussed psychological support. Indeed, Turner and Barker (2014a) highlight that coaches may opt for workshops for cost efficiency and to better manage time constraints. To compound the limited intervention delivery time, the applied nature of the research requires methodological rigour (e.g., baseline measures, control groups), which in this instance compromised and reduced the intervention duration. Looking beyond my initial frustrations it is important to acknowledge that pragmatically one-to-one sessions can be labour intensive in the correct setting a group-based modality could offer benefits beyond that of a one-to-one session.

During the group sessions, I found I was able facilitate discussion between the players about their own experiences of adversity (A), how they had responded (C) and to understand how our beliefs informs how we respond. Similarly to team based interventions such as Personal Disclosure Mutual Sharing (PDMS; Windsor et al., 2011), this process seemed to enhance the players closeness, communication, and shared understanding of dealing with adversity. For example, validating that they are not the only player who feels anxious prior to

an important match, in turn normalising the experience of negative emotions. This feeling of shared understanding between the players was apparent at the end of both group sessions. Recently Vertopoulos and Turner (2017) reported the positive effects of Rational Emotive Personal-Disclosure Mutual-Sharing (REPDMS) in reducing IBs and enhancing rational beliefs with elite adolescent athletes. The effects of REPDMS were prolonged in comparison to educating athletes regarding REBT, to this end highlighting that the process of disclosing and sharing may offer a key ingredient to enhance the effects of REBT using a group-based format. A group based delivery of REBT offers a promising intervention that may unite athletes to create a shared rational philosophy that propagates collective resilience in the face of adversity. An exciting avenue of future investigation, there also exists scope for sport psychologists to create a rational culture within elite sporting organisations. One that promotes psychological well-being and performance on an broader scale, ultimately, demonstrating larger impact whilst working within limited time-constraints.

7.3.3 Irrational beliefs and perceived helpfulness. Developing and maintaining a therapeutic relationship is central to the delivery of psychological interventions. The extent a client is open, ready, and active within the REBT process will influence its delivery (Dryden & Neenan, 2015). This responsibility to develop a working alliance, although informed by the athlete, rests largely with the practitioner. The most engaged, receptive, and open, appeared to reap the most benefits. There were however, athletes who showed signs of active and passive resistance. One athlete highlighted their belief that IBs about success and achievements were and had been beneficial for his performance. They noted that this helped them concentrate and keep motivated towards training. Therefore, even though they understood the principles of REBT they largely disagreed and continued to endorse an irrational philosophy towards sport; this was evidenced by social validation and self-report measures of IBs.

Disputing IBs is a challenging process, and is determined by the client's openness and motivation for change (Dryden & Neenan, 2015). Having never encountered resistance before I recall feelings of frustration and bewilderment, thoughts such as "why do they disagree with the approach?" and "why in their mind would this be logical? As I frantically sought empirical, logical, and pragmatic disputations to none of which resonated, little progress was made, in turn the disputation process perpetuated the client's resistance and endorsement of IBs. On reflection I want to shake my old self and challenge why is it I felt this athlete should adopt REBT? During the program of applied research I have been immersed within REBT and share a rational philosophy towards life that inherently underpin my applied practice. These 'core conditions' include: empathy towards others, unconditional acceptance (i.e., viewing humans to be fallible and too complicated to be globally evaluated), genuineness, and the value of humor (Dryden & Branch, 2008). I feel this coherence between my personal core beliefs and values with the theoretical paradigm (i.e., REBT) is central to its successful delivery. However, when working with athletes it is ironic (practitioner) that I should dogmatically enforce such principles on those who I work with, certainly a pitfall I was aware of but a trap that I may have unwittingly fallen into. It became apparent that the more I pushed the more I encountered resistance, thus I was largely responsible for prolonging the client's resistance. Upon reflection there were more important and broader questions that would have demystified my predicament. First, could IBs be motivational and if so would I compromise this for the pursuit of enhanced psychological well-being? Second, were these beliefs having a detrimental effect on his psychological well-being? Finally, what methods could I have employed to negate misconceptions and ensure I worked collaboratively with athletes? To answer these questions the present and more experienced self is much better placed to provide further clarity.

The notion that IBs are helpful and harbour motivational qualities are plausible and an interesting avenue of investigation (Turner & Barker, 2014a). However, the research to support this view is limited, instead existing evidence would suggest this is a misconception of REBT theory. Indeed, social validation from the present studies and my personal experiences indicate no changes in the intensity of an athlete's motivation, instead enhancing the quality (e.g., greater enjoyment). This notion has been supported by Turner (2016) proposing association between IBs and introjected regulation as proposed within the Self-Determination Theory (Deci & Ryan, 2000). Whereby, the perception that one 'should' or 'ought' (demanding irrational belief) to engage in certain sports is considered a hallmark of introjected regulation (Turner, 2016).

It appeared that the IBs were also having a detrimental impact on this athletes' psychological health and relationships in this athlete's personal life. It was apparent that his athletic identity was if not their only identity, in turn perpetuating the irrational belief that if they failed during archery then they would be a complete failure. The influential role of an athletic identity has received much research (e.g., Murphy, Petitpas, & Brewer, 1996), where its debilitating effects are a common phenomena in elite sport (i.e., career transitions, coping with injury, de-selection). In elite sport the commitment and exclusive dedication necessary to excel may hinder an athlete's ability to explore other behaviours and maintain multiple identities, which an athlete may draw upon when the athletic identity is compromised. Eppler and Harju (1997) proposed that having beliefs that are strongly engrained into a sole identity makes it difficult to dispute due to there being less identities which they are able to draw upon. Multiple identities (i.e., the facets of life that defines them) may buffer psychological ill-health and propagate healthy RBs regarding one's self-worth. The association between athletic identity and IBs presents an interesting and valuable line of future research.

For those practicing REBT with elite athletes it would be prudent to acknowledge that some athletes may rightfully resist and perceive such IBs to be helpful for performance. Whilst, more research is required to understand the precise effects of IBs and/or RBs on performance, practitioner's should instead adopt a holistic view of the athlete to better gauge the implications of IBs for ones psychological health and performance. Nevertheless, if one were to

7.3.4 Negating resistance. As a practitioner I have learned the value in varying my approach. During its early application REBT was enlisted as primarily an active-directive approach for functional behaviour change. However, more recently the use of both practitioner and client-led approaches has been advocated to facilitate its effect and successful receipt (Dryden & Neenan, 2015). Typically, athletes will agree with the pragmatic and logical disputations, albeit this is the reason that they seek psychological support in the first place. Paradoxically, in this instance athletes may suggest that such IBs have been helpful for their performance. To negate what can become a philosophically difficult conversation, I will ask them to reflect on several key points. For example, to encourage athletes to defend their position (e.g., “would it be fair to assume that these IBs have been beneficial for you, and you are able to respond helpfully to challenging situations?”), which typically is followed by a retraction of their resistance (e.g., “well, maybe not all the time, its just sometimes they have been helpful”). Questions such as “What concerns you about adopting RBs that suggests you cannot be successful?” and “What might the benefits be of holding RBs, not only in performance but also in day-to-day life?” have also proven useful when overcoming misconceptions of REBT. More recently I have found the adoption of Motivational Interviewing (MI; Miller & Rollnick, 2002) techniques an invaluable way to better understand the client and facilitate greater therapeutic alliance between myself (practitioner) and the client. The use of MI skills may facilitate what can be a

challenging endeavour of disputing and replacing individual's beliefs, which are often difficult to access and stubborn to change. Particularly, when giving advice MI advocates that practitioners: 1) offer information and to not impose it, 2) clarify if clients want the information before providing it, 3) make reference in the context of other clients, 4) allow the client to disagree with you, and to invite clients to offer their thoughts on your advice (Rosengreen, 2009). If utilised effectively such techniques typical to MI provides the 'how' to the 'what' that the ABC(DE) model offers.

7.3.5 Avoiding semantic pitfalls. When working with athletes I commonly encounter irrational language. During the applied phase of this thesis I was heightened to the athlete's use of language that may have alluded to the presence of the core IBs (e.g., demand, frustration intolerance, awfulizing, self/other/life downing). For example athletes would often state they "had to win" and "losing last weekend was terrible". At the early stages of my training I incorrectly concluded that this signified the presence of IBs, where in some cases this was not the case. Similarly, when hearing words such as "anxiety" or "angry", I made similar leaps in assuming the presence of unhealthy negative emotions in response to adversity.

Looking back, it is easy to understand and reap the benefits of hindsight, however I am able to appreciate this is largely part of the developmental process. Referring to the philosophical work of Ludwig Wittgenstein, Lindsay, Pitt and Owen (2014) suggest sport psychology suffers from conceptual confusions and misunderstandings that are underpinned by our misguided use of language. This mix-up can culminate in misleading and hasty conclusions that are not conducive for effective intervention delivery, and receipt. This is an important reflection for practitioners looking to adopt REBT. Firstly, the meaning I (practitioner) draw from the word "anxious" (unhealthy negative emotion) is likely to be different to the athlete's (e.g., directional interpretation, intensity, meaning). Secondly,

irrational language is ubiquitous. To explain, a recent media interview with Liverpool Football Club manager Jurgen Klopp (JK) persuasively articulates the use of irrational language and the pitfalls we may fall into with our assumptions. The headline quoted JK as saying “this was a must win game”, indicative of a dogmatic and irrational demand for achievement. Whereas, in the accompanying video interview he is asked about his teams performance in a closely fought draw, and presents a largely rational view of the fixture:

“You saw how big the disappointment was for the people, its football, its only a goal... this is the first problem, if you feel this you can maybe understand why we are not calm enough in situations where we have the chances. They are playing like it is the last thing in our life, we have to cool this down, and we are ready to work hard”

Jurgen Klopp (Liverpool Football Manager (2015 – to date)).

The use of irrational language does not directly constitute-underlying IBs (e.g., “losing would be terrible”), instead it may represent a word in an athlete’s lexicon that has been used to signify the possibility of a situation being bad. In addition, athletes may express conditional demands as a “must” and “have to” that are both plausible and logical. For example, an athlete may state, “If I am to attain a top 100 ranking, I must win this weekends tournament”. For those looking to adopt REBT, it is important to become familiar with conditional demands (rational) and unconditional demands (irrational) which ultimately underpins emotional disturbance (Dryden & Branch, 2008). It would be prudent for sport psychologists to negate this pitfall, because REBT relies upon a shared understanding of language that signifies two distinct pathways (e.g., helpful and unhelpful/functional and dysfunctional/ adaptive & maladaptive; DiGiuseppe et al., 2014). Thus, underlining the value of having a sensitive and nuanced understanding into the athlete’s use of language in sport. To ensure this process practitioners are recommended to explore and thoroughly investigate the functionality of athletes’ cognitions, emotional, and behavioural responses towards their goals when encountering adversity (e.g., failure, rejection, & poor treatment).

From a practitioners perspective an important caveat is to acknowledge that the use of irrational language is not restricted to athletes. I have been surprised to notice its prevalence in elite sport (e.g., media, staff), and most ironically within my own lexicon. Whilst it may not be indicative of irrational philosophy it would also be foolhardy to assume that such dogmatic and extreme use of language may not perpetuate its prevalence in others and have a contagious effect. Slater and Turner (2016) allude to the notion that beliefs not exclusively but largely are ‘socialised’ into us through interaction with others; whereby peoples values and beliefs can be transferred through a group as a result of strong emotional connections”.

7.4 Applying REBT within Elite Disability Sport

7.4.1 REBT and elite athletes with a disability. The efficacy of REBT as a treatment for psychological distress has received a plethora of research and extensively investigated across populations and demographics. Although sparse researchers have alluded to the applicability of REBT within medical settings, notably for those with a physical disability and/or experiencing physical pain. Ellis (1997) published an autoethnographic account of applying the principles of REBT such as: anti-awfulizing and unconditional self-acceptance with his own physical disabilities, essentially to promote a life that was happier and more productive. Furthermore, Calabro (1997) speaks of the psychological adjustment process for those who acquire a sudden physical disability and are then discharged from hospital prior to acquiring the necessary psychological skills to cope. Specifically, Calabro (1997) proposed the effects of a sudden physical disability on an individual’s hierarchy of needs (as proposed by Maslow). Considering the applicability of REBT as an effective intervention, very few studies provided empirical evidence supporting its efficacy, as well reporting its application to facilitate psychological health in those with a congenital or acquired physical disability.

7.4.2 Working with athletes with a physical disability In this section I want to share my professional practice reflections of applying REBT with athletes with a physical

disability. Specifically, in Chapter four I worked with athletes on the Paralympic podium performance program who were classified into three categories of functionality. Standing Class (ST1) was for athletes with no loss of function in their arms, but with some degree of loss of muscle strength, co-ordination and/or joint mobility in their legs. There was also a W1 classification for athletes who have tetraplegia or a comparable impairment, these athletes had limited movement, strength, and control in their arms and legs – competing in a wheelchair. Finally, there was a W2 class for athletes who have paraplegia or a comparable impairment. W2 athletes have limited mobility in the lower limbs, but full arm function. These athletes usually require a wheelchair for everyday use, but also compete in a wheelchair (British Paralympics Association, 2015). During Chapter five I applied REBT with an Elite B1 National Soccer Team. A B1 is a classification for players who have a visual acuity lower than LogMAR 2.6 (acuity from no light perception up to and including hand movements; British Blind Sports, 2015). Both participant groups were primarily categorised as having a physical disability and much like the Olympic games for able-bodied athletes competing in the Paralympic games represented the pinnacle in their athletic careers. Prior to working with both groups I felt an overwhelming sense of uncertainty. I had a limited experience of working with athletes with a disability and was conscious of ensuring that I was sensitive and considerate of the athlete's physical and psychological needs. Similarly, I wanted allow them autonomy and independence, that I would afford any other athlete I worked with.

7.4.3. My approach. Prior to working with both groups and to manage my concerns I sought guidance from a variety of sources and it was here I learnt my first lesson. After a meeting with a learning support officer. He politely highlighted that when I spoke of “disabled athletes” I was inferring that athletes are defined by their disability, where instead they are humans who have a physical disability. Such a view is largely coherent with the

philosophy of REBT that any facet of a human provides no objective basis for determining an individual's self-worth (Chamberlain & Haaga, 2001). Although a subtle point, it was an important one that shaped my view when applying REBT.

7.4.4. Congenital and acquired physical disability. There is little research that investigates the effects of psychological intervention with elite athletes with a disability. A review by Jaarsma et al. (2014) highlighted the barriers and backgrounds athletes with disability may encounter during sports participation. Similarly to able-bodied athletes a lack of time, lack of motivation, and access to facilities were highlighted as barriers to participating in sport. Whereas, athletes with a disability also experienced additional barriers, such as low energy levels, transportation, information access, and the quality of supervision. Whilst exploring the type of challenges athletes may encounter, I conducted some reading to make sense of how an experience of a physical disability affected an athlete's psychology.

The onset of experienced disability can be categorised as acquired or congenital. Acquired disability categorises individuals who have acquired their particular condition, whereas, congenital disability refers to an impairment that has been present from birth. Further, Livneh and Antonak (1997) stated that people with acquired and congenital disabilities differed psychologically. For those athletes with an acquired disability their acquisition of a physical impairment may have been gradual, or after an acute traumatic incident. Skordilis et al., (2006) explains that such individuals have to deal with a sudden and prolonged crisis alternating between acknowledging their pre-disability identity and new 'disability' identity (Yoshida, 1993). This can be shown in attempting super-human endeavours to demonstrate the control, meaning, and identity they held prior to their injury. In addition, they are likely to only see themselves in a negative light, diminished self-worth, and severe depression. Although, this was not the focus of the given REBT intervention, the applicability of REBT with such populations seems both valuable and applicable when

dealing with the adjustment process after acquiring a physical disability. In contrast those with a congenital disability experience psychosocial adaptations associated with an impaired body, body image, and self-identity issues (Skordilis et al., 2006). Considering the individual differences in the speed and quality individuals will transition through the adjustment process it was important that I was sensitive to the athletes history, whilst gauging their respective acceptance of having a physical disability.

7.4.5 Intervention delivery. Prior to intervention delivery I needed to consider any adjustments and meet the needs of the given group. Particularly with the B1 team I explored various avenues of delivery (e.g., braille, objects). At the beginning of this process I attempted to empathise and understand the athlete's perspective however, I remember feeling as if this was largely uninformed and subjective. After asking the athletes directly for their preferences, the group workshop was to be discussion based whilst each player was to be provided with audio recordings that recaptured the session's key points. When working with the Paralympic athletes, I was required to provide five one-to-one sessions lasting for 30 minutes each to all eight athletes. A prescriptive and controlled delivery is central to ascertaining the intervention effects within applied research, however it fails to consider the individual differences and needs of each athlete. Altering the pace and content to suit the athletes' needs is central to not only REBT (Dryden & Neenan, 2015), but most interventions employed with athletes. Looking back I feel that the flexible application of REBT is even more important when working athletes with a physical disability. These athletes will have a varied and somewhat exceptional histories that may influence their ability to learn, comprehend, and adopt principles associated with REBT. This postulation was socially validated by the lead sport psychologist from Chapter four- who stated:

“Within this group of we have some very complex individuals, who have some deep-rooted beliefs, who have had very traumatic experiences in their lives, which have shaped their personalities and the way they are. Maybe for some, 5 sessions really only

scrapes the surface”.

7.4.6 An altered perspective. During my time with the B1 team there was plenty of downtime to interact with the players. Only through this accumulated experience was I able to empathise and further understand their perspective on life and being a B1 player. During one conversation a player spoke of becoming tired and mentally fatigued relatively quickly compared to those with no visual impairment. Here I gleaned that B1 players are required to continuously process more information to ascertain their surroundings and communicate effectively with others. This was also compounded because visual cues could not be used to capture their attentional focus; instead their cognitions and verbal communication filled this void. In addition, those without visual impairments are able transition from light to relative darkness to facilitate sleeping patterns, yet B1 players are not afforded this process, in turn having implications for their sleeping habits. By no means exhaustive, the aforementioned factors example what may be overlooked by practitioners who start to work with athletes with a disability.

7.4.7 Final thought. Athletes with a disability should not be viewed as failed versions of “the normal”. My experience of working with this particular demographic has taught me that athletes with disability should not be defined by their disability, but in the same instance practitioners should be sensitive to their history, experience, and how well they are adjusted to having a physical disability. Practitioners are recommended to take a client-centred approach to truly understand the athlete’s perspectives as this provides a fruitful resource to inform the type and delivery of the interventions. As expected the ABC(DE) model provides an appropriate and applicable model that needed little alteration, and although not the main focus of the current investigation it presents a promising intervention to use with elite athletes who are adjusting to acquisition of a physical disability.

7.5 Summary

The application of clinical models are emerging and garnering attention within the sport psychology literature. Given the recent emergence of REBT there exists a dearth of professional practice literature applying REBT with able-bodied (e.g., Turner & Barker, 2014a), and elite athletes with a disability. In-line with aim three of the present thesis the current chapter presented a reflective and layered account of my experiences and learning during the current programme of research. Emphasis was placed on the application of REBT rather than simply understanding the theoretical basis of REBT. Using a reflective diary as a guiding resource a variety of poignant reflections were offered. Such salient themes included: ethical considerations, harnessing the potential of group based modalities, negating athlete resistance, avoiding semantic pitfalls, and considerations to make when applying REBT with athletes with a physical disability. Unlike clinical practitioners who may specialise in a single approach, sport psychologists may draw from a variety of approaches that are in synchrony with their philosophy of practice (Poczwadowski, Sherman, & Ravizza, 2004). In addition, these methods are driven by the athlete, intervention goals, and the context, which is conducted in often varied and unusual environments (Andersen, Van Raalte, & Brewer, 2001). Hence, with its increasing adoption by sport psychologists there may appear a disparity between good intentions and the expertise to effectively apply REBT to promote psychological well-being and performance.

I have alluded to the challenges that I encountered and attempted to negate on my journey. From a research and applied perspective it is recommended those who use REBT to consider the treatment fidelity of its application. Treatment fidelity refers to the methodological strategies used to monitor and enhance the validity and reliability of behavioural interventions (Bellg et al., 2004). Focus should be given to intervention providers, ensuring the reliability and the validity of REBT delivery (i.e., are interventions

being delivered as intended). For example, are practitioners utilising, cognitive, behavioural, and emotive techniques (Dryden & Neenan, 2015) to reinforce a rational philosophy.

Strategies to control such inconsistencies may include, standardised training before delivery that is guided by well-defined performance criteria, minimising drifts in practitioner skills, and reducing the disparity in intervention protocol between practitioners (Bellg et al., 2004).

Chapter 8

General Discussion

The investigation into understanding human beliefs offers important implications for research and practice aiming to enhance human functioning across various performance contexts. The aims of this thesis were to: 1) conduct a systematic examination into the effects of REBT on key performance indicators and measures of performance (Chapters three - five), 2) To determine the effects of irrational and rational self-statements across a range of outcomes indicative of performance (Chapters six), 3) To explore and glean insights into the applied practice of REBT for practitioners working within performance settings (Chapters three – five & seven). In Part I of the present thesis the dynamic and demanding setting of elite sport was used to fulfil aim one and two of the thesis. To further elucidate findings, broader performance markers were assessed in Part II using a rigorous experimental methodological design. Moving beyond the research the present findings demonstrate the application of REBT as an intervention to enhance athletic performance. This thesis contributes to the scant theoretical literature that attempts to understand the effects of irrational and rational beliefs on performance.

8.1 Summary of Findings

Chapter three explored the effects of a comprehensive one-to-one REBT intervention on performance and psychological outcomes in a nationally ranked archer. The study provided an idiographic examination into the acute and maintained effects of REBT, using measures of trait irrational and rational beliefs, self-efficacy, perceived control, and competition performance scores. Results showed that the application of seven REBT sessions brought around reductions in IBs and increases in RBs. Such changes were matched by increases in self-efficacy and perception of control in reference to 10 archery specific performance markers and mean competition performance scores between pre- and post-intervention time-points. All changes were maintained at a three and six-month follow-up

time point, furthermore, social validation highlighted that the participant experienced greater enjoyment towards their sport.

Although promising a case-study does not provide conclusive empirical evidence regarding the intervention effectiveness (e.g., reliance on self-report measures, no control group, and maturation effects). In Chapter four, the effects of five one-to-one REBT sessions (30- minutes/session) on athletic performance in eight Paralympic athletes were examined. A rigorous single-case multiple baseline research design was used to examine the acute and maintained (9-month follow-up) effects of REBT on IBs, trait anxiety, baseline physiological measures (systolic blood pressure), and competition simulation performance scores. Furthermore, a single-case research design was used to refine and develop the delivery of REBT (Barker et al., 2013), gleaning valuable professional practice insights. The findings in Chapter four partially support those presented in Chapter three, whereby reductions in IBs reported in six out of the eight participants after receiving the REBT intervention. Analysis of the data also suggested that for some, reductions in IBs were aligned with reductions in systolic blood pressure - indicative of an adaptive physiological response and improved competitive simulation performance scores. Social validation data suggested participants reported greater self and other awareness, emotional control, and enhanced concentration during competition simulations. In contrast to the study hypothesis, participants reported no changes in trait anxiety, and notably one participant reported perceiving IBs to be helpful for athletic performance.

Whilst Chapter three and four reported the promising effects of REBT, the use a one-to-one format in the dynamic context of elite sport was considered labor intensive, and instead application of brief contact and single-contact interventions was considered a viable modality for REBT application (Giges & Petitpas, 2000). In Chapter five the effects of a single-REBT workshop on trait IBs, pre-performance anxiety, baseline physiological

measures (systolic blood pressure), and subjective ratings of penalty-kick performance were examined. Results from Chapter 5 were mixed and showed that the REBT intervention was coupled with acute but not maintained reductions in IBs for one group out of the two. Due to the reduced intervention dose (three sessions to one) changes in dependent variables (i.e., altered perceptions of pre-performance anxiety, and reductions in baseline physiological measures (SBP) prior to a penalty kick performance were mixed. Findings indicate that single-group workshop was insufficient in promoting meaningful or lasting changes in an athlete's beliefs. The findings from both Chapters four and five present an applied examination into the effects of a psychological intervention (i.e., REBT) within a specialised population (i.e., elite athletes with a disability) that had received scant attention in the current literature.

In Chapter six (Experiment 1) the effects of irrational and rational self-statements on acute performance using measures of pre-performance anxiety, concentration disruption, and golf-putting performance during a motivated performance situation were examined. Previous researchers reported reductions in task performance and increased anxiety when adopting irrational self-statements compared to rational alternatives. In contrast the results showed no differences in golf-putting performance, pre-performance anxiety, and concentration disruption between irrational and rational self-statement conditions, whilst controlling for baseline scores. As in Experiment I, in Experiment II the effects of irrational and rational self-statements on performance effectiveness (i.e., hazard perception performance score), performance efficiency (i.e., eye gaze behaviour), physiological arousal (i.e., heart rate), and pre-performance anxiety during a competitive hazard perception performance task were investigated. In addition, the effects of irrational and rational self-statements were examined on task persistence (i.e., breath-holding) and perceived mental effort during a competitive breath-holding task. As in Experiment 1 and in contrast to previous researchers the results

showed no differences in outcome measures between irrational and rational self-statement conditions.

Chapter seven provided a reflective account into the application of REBT, offering practitioner insights and recommendations for practice with both abled and elite athletes with a disability. Salient points included: ethical considerations, the potential of personal-disclosure and mutual sharing when applying REBT, negating athlete resistance, avoiding semantic pitfalls, and considerations to make when applying REBT with athletes with a physical disability.

Acknowledging the established effects of REBT on psychological health the thesis findings from part one (Chapters 2-5) suggest REBT offers a potentially useful intervention to enhance athletic performance. The results also indicate the presence of a dose effect, whereby both greater and maintained (3 – 9 months) reductions in IBs were influenced by the modality (i.e., one-to-one provision) and intervention duration. Reductions in IBs were also coupled with increases in self-efficacy, perceived control, and athletic performance, as well as reductions in avoidance goals. In contrast to previous research the findings from Part II indicate no differences in objective markers of motor-skill and hazard perception performance, performance efficiency, and task persistence during motivated performance situations. Thus, indicating that IBs may not be detrimental for acute performance, and the relationship between ones beliefs and performance maybe more complicated than previously hypothesised.

8.2 Explanation of Findings

8.2.1 REBT and athletic performance. In-line with recent research the findings from Chapters three and four support the value of REBT as an intervention that may facilitate athletic performance (e.g., Turner & Barker, 2013; Turner et al., 2014). Using the context of elite sport reductions in IBs were also coupled with self-reported performance benefits (i.e.,

enhanced emotional control, self-awareness, competition concentration, rational self-talk) and improvements in athletic performance. Aligned with previous suggestions (Turner & Barker, 2013) and the findings from the current thesis, there is evidence to suggest that elements of Cognitive Appraisal Theory (CAT; Lazarus, 1991) may shed some light into the process by which REBT brings about changes in performance. Alternative explanations not presented in existing literature are also put forth to explain the thesis results.

8.2.1.1 An integrated view of REBT theory. In Chapter three the data highlighted reductions in IBs and increases in RBs were aligned with improved performance, increased self-efficacy, perceived control (i.e., secondary appraisal), and perceived reductions in self-placed demands (i.e., primary appraisals). In Chapter four reductions in IBs were matched with greater reductions in approach orientation, increased competition simulation scores and subjective performance benefits. To explain, beliefs are proposed to largely influence one's appraisal of the significance of the person-environment encounter (David et al., 2002; see Figure 6.1). According to the CAT a primary appraisal consists of motivational relevance and motivational congruence (Smith et al., 1993; representing the situation as a harm/loss, threat, challenge, or benefit). In REBT terms this is comparable to the interaction between the adversity (A; e.g., failure, rejection) and ones irrational/rational beliefs (B; David et al., 2002). A secondary appraisal is the cognitive evaluation of ones resources and options to cope with threatening stimuli, accordingly, dictating the functionality of ones emotion and ability to cope (David, 2003). Essentially ones beliefs will shape an individual's primary and secondary appraisal of a situation. A rational belief "I would like to win therefore I must, if I do not it would be terrible" may reduce the likelihood of a disproportionately threatening or harmful primary appraisal (Ziegler, 2001). In turn, allowing for a more flexible, realistic, and positive secondary appraisal about their own coping resources (e.g., I really want to but I don't have to win, it will be bad but won't be terrible if I underperform, so what do I need to

do to perform to my best). This may result in a more effective coping strategy (i.e., problem/emotion/appraisal focussed coping strategies) suitable for the given context (Nicholls, Polman, & Levy, 2007). In REBT terms this is comparable to healthy and adaptive consequence that facilitates goal achievement. On the contrary those who harbour IBs (i.e., “I would like to win, therefore I must, if I do not it would be terrible”) will disproportionately exaggerate the consequences and danger of the situation (primary appraisal). In turn hindering and/or reducing one’s perceived resources to cope during the secondary appraisals, thus leading to ineffective coping strategies. Ultimately the inclusion of primary and secondary appraisals may help explain the mechanisms by which irrational and/or rational beliefs mediate the emotional and behavioural response, and performance when encountering adversity.

8.2.1.2 The process of REBT and re-appraisals. Not restricted to primary and secondary appraisals, social validation data from Chapters three, four, and five also suggest that the REBT process allowed athletes to consciously reappraise adversities that they would inevitably encounter. The athlete – environment relationship is always changing, along with the emotional, action tendencies, and behavioural consequences (Lazarus, 1991). In Chapter three and four participants highlighted that enhanced concentration and emotional control during competition was a function of greater self-awareness and the use of rational self-talk as an effective coping strategy. In-line with REBT theory a rational re-appraisal may prevent or minimise the escalation of unhealthy and maladaptive meta- cognitions/emotions. To illustrate, from a temporal perspective an individual who harbours IBs may experience greater anxiety after feeling anxious, or depressed after feeling angry (Dryden & Neenan, 2015) that may lead to maladaptive consequences and further hindering the chances of goal achievement. Comparably to the stress and coping literature, researchers purport and evidenced that the stress is not a single phenomena rather a transactional and dynamic on-

going process (Lazarus & Folkman, 1984); and so the ability to rationally re-appraise an adversity may present an adaptive coping strategy when faced with failure, rejection, or setbacks (Nicholls et al., 2010). The integration of REBT theory and cognitive appraisal theory (i.e., primary, secondary, & re-appraisals) helps to explain and predict the mechanisms by which IBs and/ RBs may help or hinder athletic performance. It is hypothesised irrational and/or rational beliefs influence individuals appraisals when encountering adversity, acting as a proximal cognitive antecedent to ones emotional and behavioural response. Nonetheless, such conclusions remain largely speculative and warrant further examination.

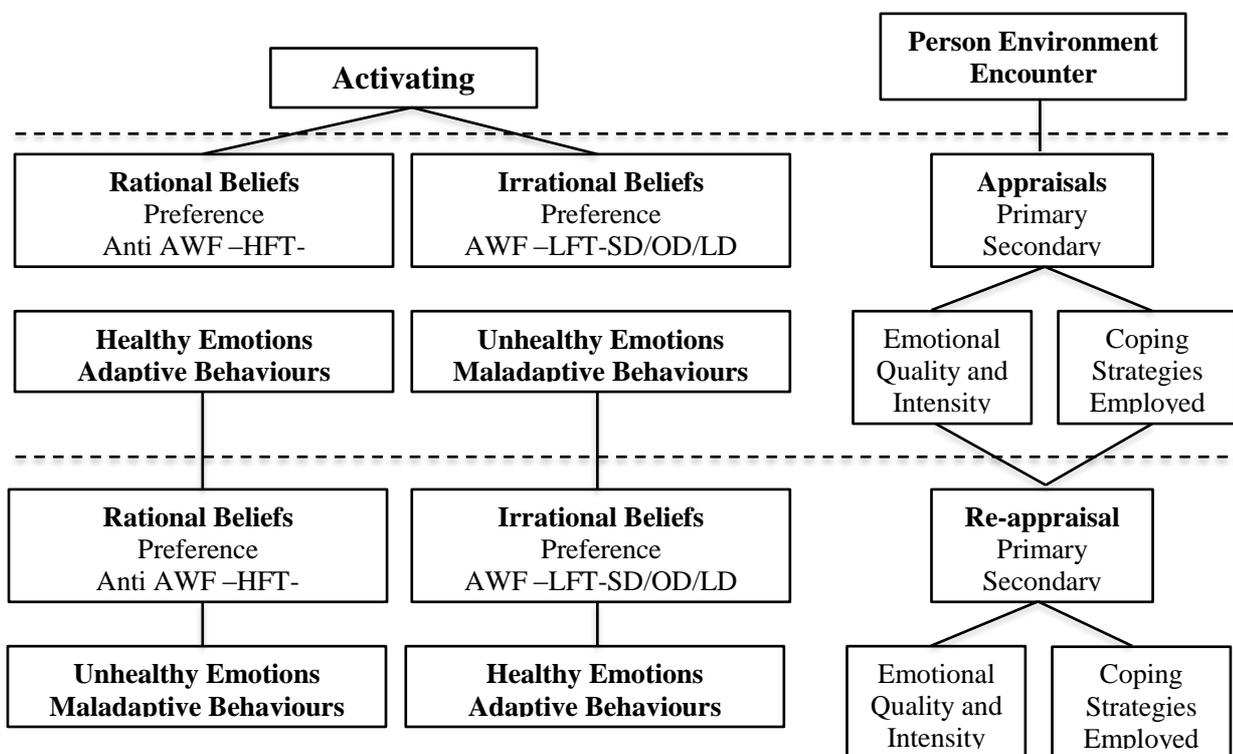


Figure 8.1 A diagrammatic integration between

REBT theory (left) and Cognitive Appraisal Theory (right) adapted from David et al. (2002).

8.2.1.3 Anxiety and performance. The findings from Chapters three, four, and five broadly contradict the findings in previous research that indicated that reductions in IBs were also aligned with reductions in measures of anxiety (e.g., Elko & Ostrow, 1991; Turner & Barker, 2013; Yamauchi & Murakoshi, 2001). In contrast to previous experimental research

(Rosin & Nelson, 1983) findings from Chapter six also indicated no differences in pre-performance anxiety (intensity; Chapters six – experiment 1) and the perceived helpfulness of anxiety (experiment 2) between irrational and rational self-statement conditions. Although distinct to previous research these results can be explained by the following methodological and theoretical reasoning.

First, in Chapter three measures of trait rather than state anxiety were assessed. Considering the REBT intervention was centred on disputing and replacing IBs orientated towards success and failure within their sport, greater changes may have been expected in pre-performance anxiety rather than self-reported trait anxiety. Second, in Chapter five the intervention dose (single 60-minute workshop) may have been insufficient in bringing about meaningful changes in self-reported anxiety. Whilst the data suggested participants' perception rather than intensity shifted towards a helpful view prior to a penalty-kick simulation, this conclusion should be treated with caution due to a small sample size. Previous research that used a workshop format with greater number of sessions (six; Lerner et al., 2007) evidenced facilitative shifts in participants' directional interpretation of anxiety. Third, acknowledging the association between intervention dose and outcomes the results from Chapter three may indirectly support the notion that REBT if delivered effectively will reduce the intensity or encourage adaptive shifts in anxiety. To explain, data from Chapter three highlighted meaningful changes in perception of control across 10 performance markers over the course of seven one-to-one REBT sessions. Within the anxiety-performance literature the regulatory subcomponent of the three-dimensional model (Cheng et al., 2009) re-conceptualises and supports the adaptive vs. maladaptive distinction in negative emotion such as anxiety. Athlete's perceived control to cope and attain goals under stress is proposed to influence both the adaptive quality of anxiety. Thus, although anxiety was not assessed we

may predict increased perception of control, led to decreases or healthy shifts in the athletes' experience of anxiety, in turn fostering an adaptive behavioural response.

The present findings contrast with previous research, highlighting that reductions in IBs were not coupled with reductions in anxiety. To further comprehend the thesis findings broader conceptualisations of anxiety and the mechanisms by which REBT may have brought about the changes in outcomes measures are discussed.

8.2.1.4 Mechanisms for change. First, within the REBT literature there is much conjecture surrounding the unitary vs. binary model of emotion formation (Cramer & Fong, 1991). Contemporary literature favours the notion negative emotions (e.g., anxiety, depression, anger) are qualitatively distinct (healthy vs. unhealthy; Hyland & Boduszek, 2012). When reducing ones IBs regarding success and failure, we may expect to see no reductions in the intensity of one's anxiety, instead an alteration in the functionality. However, most research does not assess the binary model, instead previous researchers have reported reductions in cognitive or competitive anxiety after receiving REBT (e.g., Turner & Barker, 2013). In Chapter five and six the effects of irrational and rational self-statements on emotional functionality were assessed measuring participants perceived helpfulness of pre-performance anxiety. However, participants reported no significant differences in their perceptions of anxiety. It would be prudent to note, theoretically the assessment of emotion perception does not assess emotion functionality as proposed within REBT theory. Indeed, due to the inherent complexity in assessing emotion function (i.e., contextually and individually specific; Dryden & Branch, 2008) there exists no validated and reliable assessment to date (i.e., concern vs. anxiety; healthy anger vs. unhealthy anger; sadness vs. depression). The validation and accurate assessment of emotion functionality has

theoretical (i.e., ABCDE model) and applied implications (i.e., practice of REBT), ultimately elucidating the mechanisms between irrational and/or rational beliefs, emotion, and performance.

Second, rather than advocating positive emotional consequence to adversity the process of REBT encourages individuals to normalise negative emotion (healthy vs unhealthy). The presence of healthy negative emotions makes it possible to respond adaptively, attain respective goals, and experience a swift return to a normative or positive emotional state. The adaptive qualities of negative emotions in sport are well supported. Athletes often purposefully regulate and increase the intensity of negative emotions (e.g., anxiety and anger) in the belief it will facilitate performance (Stanley, Lane, Devonport, & Beedie, 2012). In addition, a rational philosophy promoted as part of the REBT process emphasises human fallibility, in turn encouraging clients to unconditionally acceptance themselves irrespective of their treatment from others and/or success in tasks. Researchers have proposed the aforementioned tenets of REBT although not wholly share similarities with third-wave therapies and may shed some light on the potential mechanisms between beliefs, anxiety, and acute performance (e.g., acceptance and mindful-based approaches; Ellis, 2005; Hayes, 2005).

Central to mindful and acceptance based models is the notion that any attempts to control (i.e., avoid, evaluate, or judge) negative thoughts or emotions paradoxically perpetuate psychological disturbances and lead to performance breakdown (Gardner & Moore, 2012). Previous researchers have suggested emotional and behavioural avoidance can stem from IBs (Ciarrochi, Rob, & Godsell, 2005). Indeed, the contradictory effects of judging and conscious efforts to remove negative thoughts have been well documented within the sport psychology literature (e.g., Ironic processes; Wegner, 1994). Similarly to REBT theory, the relational framework theory (Hayes, Barnes-Holmes, & Roche, 2001)

central to mindful and acceptance models encourages people to change their relation frame/new associations with the same emotion rather than reducing the intensity or frequency of their emotion.

To explain, the ABC(DE) model is transactional in nature, continuously appraising the significance of the personal-environment relationship. So when faced with adversity an athlete rather than attempt to eradicate negative cognitions and emotions, will instead meta-cognitively appraise negative emotions as normal, and not experience maladaptive secondary disturbances (Ellis, 2005). Previous researchers that examined the application of traditional psychological skills training (e.g., self-talk imagery, goal setting) have reported: reductions in competitive anxiety (e.g., Holmes, Beckwith, Ehde, & Tinius, 1996) and increased self-confidence (e.g., Burton, 1989; Daw & Burton, 1984; Maynard, Smith, & Evans, 1995), yet improvements in objective athletic performance have been inconsistent and generally insignificant. Essentially, these findings may shed some light into an alternative hypothesis by which REBT and one's beliefs will determine emotion (e.g., anxiety) and ultimately effect performance.

Addressing aim one of this thesis and moving beyond literature, Chapters three and four provide partial support for REBT as an effective intervention to facilitate an athletes' psychological approach to competition and then enhance performance. Across both Chapters three and four reductions in IBs were matched with improvements in psychological (e.g., self-efficacy, perceived control, avoidance goals), subjective, and for some objective performance scores. In-line with the thesis findings various processes by which REBT may bring about such changes have been put forth, in turn making contributing to the REBT and sport psychology literature.

Although offering plausible explanations, the precise mechanisms between one's beliefs and anxiety remains largely speculative and requires more rigorous and controlled

examination. To compound the need to examine this further, aspects of social validation in Chapters three, and practitioner reflections put forth in Chapter seven alluded to the helpful perceptions associated with IBs and enhanced athletic performance. In Chapter six findings highlighted a nuanced view into the functionality of irrational and/or rational beliefs towards performance, certainly a view that has received much anecdotal support, yet little empirical investigation.

8.2.2 Effects of irrational and rational beliefs. There exists scant applied experimental research that examined the effects of irrational and/or rational beliefs on behavioural performance (David et al., 2010). Moving beyond previous research in Chapter six, a rigorous applied methodological design was used to further examine the effects of IBs and/RBs on performance and associated outcomes. In contrast to Chapters three and four, participants reported no significant differences in measures of motor-skill performance when adopting rational or irrational self-statements during a competitive task. These findings, not only counter previous experimental research (e.g., Bonadies & Bass, 1984), but also challenge the notion that IBs are wholly unhelpful and maladaptive in the pursuit of goal achievement. Indeed, in the same respect that positive and negative emotions can exert helpful and unhelpful effects on performance (D'Urso, Petrosso, & Robazza, 2002), it appears irrational and rational beliefs can also exert detrimental and beneficial effects depending on an individual's idiosyncratic interpretation and contextual factors. Considering the anecdotal accounts and the postulations from previous researchers (e.g., Turner & Barker, 2014) reference to the cognitive appraisal theory may help elucidate how an irrational approach may facilitate acute performance.

8.2.2.1 Appraisals. Previous researchers proposed IBs lead to an exaggeration of the importance of performing well, leading to unreasonable and self-imposed demands that are largely unattainable (Bonadies & Bass, 1984; Turner & Barker, 2014). As mentioned

previously, the CAT may help elucidate the conditions for when IBs may help as well hinder athletic performance. To explain, one's beliefs about adversity have been shown to influence the primary and secondary appraisal process (David et al., 2002). Accordingly, the process of REBT reduced an athletes' endorsement of IBs, in turn influencing the primary and secondary appraisal interaction of an athlete when encountering adversity (i.e., competitive performance task). For example, the irrational belief of "I would like to win, therefore I must, if not it would be terrible, and this would make me a complete failure" may exacerbate the situational importance and induce a threat appraisal, in turn hindering one's ability to perform. To illustrate, in a review of factors associated with poor penalty-kick performance Jordet et al. (2007) reported perceived importance as a key variable and to be negatively associated with penalty-kick performance. Accordingly, Wood et al., (2015) advocated the application of REBT as an intervention that may reduce a player's perceived importance of a kick (e.g., "It would be bad but not terrible if I missed) and negate threat appraisals. In addition, this may be particularly pertinent for players low in self-efficacy (e.g., past performances; Bandura, 2006) and when performing under high levels of scrutiny. Nevertheless, in some circumstances irrespective of the situational importance and endorsement of IBs an athlete may still perceive the sufficient resources to cope with the situation (e.g., secondary appraisals; David, 2003) and performance would remain unaffected. This notion can be supported by a participant in Chapter four who was performing extremely well (i.e., recently broken the world-record) and perceived their IBs to be helpful towards performance. Subsequently, this athlete strongly endorsed IBs associated with success and failure without ramifications on his performance. In this case the participants self-efficacy beliefs (secondary appraisals) may have buffered the dogmatic and extreme demands of the IBs when encountering adversity (i.e., important competitions). Ultimately, the primary and secondary appraisal process may help explain whether the endorsement of IBs will hinder or

help athletic performance. Certainly, further exploration into the mechanisms and mediators between beliefs and appraisal process offers a fruitful area of research.

8.2.2.2 Attention and performance efficiency. Overcoming inherent limitations of self-report measures, within Chapter six the use of eye gaze data offered an objective and accurate assessment into the effects of irrational and rational self-statements on performance. Specifically, assessing the cognitive consequences and attentional focus, as predictors of both performance efficiency and effectiveness. According to the process efficiency theory (PET; Eysenck & Calvo, 1992) emotions such as anxiety may take up available processing resources in the working memory, in turn hindering performance efficiency. However, decrements in efficiency may not be reflected in performance outcomes (e.g., task score) as performance can be maintained with greater effort (Wilson et al., 2006). Measures of mean fixation duration (Crundall et al., 2012) and fixation duration to a detected hazard (Garrison & Williams, 2013) were indicative of performance efficiency and increased attentional capture respectively. Contrary to the study hypothesis and previous studies (e.g., Schill et al., 1978, Bonadies & Bass, 1984) results showed no significant differences in the visual search behaviour between irrational and rational self-statements. In contrast to REBT theory these findings counter the postulation that IBs may lead to maladaptive cognitive consequences, whereas RBs lead to adaptive alternatives. Although these findings did not explicitly assess beliefs pertinent to each participant, the findings go some way to elucidate the complexities and multi-faceted effects IBs may have on performance, that have been overlooked within the literature. Indeed, there are intriguing findings reported within the current thesis that begin to elucidate the associations between REBT, that is changes in irrational and/or rational beliefs, motivation, and performance.

8.2.2.3 Motivation. Previous researchers proposed IBs may harbour motivational qualities (Turner & Barker, 2014a). Indeed, anecdotal accounts and semantic interpretation of

an irrational belief “I must be successful, otherwise it would be terrible” could be interpreted in terms of greater motivation towards a given task. For example, compared to RBs an athlete who endorses IBs may experience a greater a sense of threat and action impulse when encountering an adversity (A) that impedes their goals. Appreciating the challenges and stressors inherent within elite sport (Weston et al., 2009) it would be plausible that IBs facilitate athletes’ perseverance in the face of hedonic costs in an attempt to realise long-term ambitions, certainly an important component of adaptive functioning (Williams & DeSteno, 2008). However, according to REBT theory (Ellis & Dryden, 1997) irrational and rational beliefs do not differ in motivational intensity. It would be rational for an athlete to believe “I want to win more than anything in the whole world, yet that doesn’t mean I have to”. Findings from the present thesis begin to elucidate the effects of REBT and the relation between IBs and motivation.

In Chapter six the effects of irrational and rational self-statements on a raw measure of task persistence were examined (Sütterlin et al., 2013.). Findings showed no main effects in task persistence, indicating rational and irrational beliefs may not differ in motivational intensity. In Chapter four data indicated reductions in IBs to be associated with greater reductions in avoidance goals compared to approach goals. Previous research highlights approach goals to be associated with positive achievement related processes compared to avoidance goals (Jones et al., 2009; Nien & Duda, 2008). Athletes who endorse IBs about success and failure may be overtly focussed upon averting failure rather than striving for success when approaching a competition. The findings from Chapters three, four, and five also intimate the endorsement of irrational and/or rational beliefs may influence the quality of one’s motivation.

To explain, qualitative feedback and social validation data showed rather than reducing motivation reported greater enjoyment towards their sport. According to the Self-

Determination Theory (Deci & Ryan, 1985) greater enjoyment is often associated with increased intrinsic motivation towards a given task or goal. Early research by Zuckerman, Porac, Lathin and Deci (1978) reported an individual's perception of choice and preference, such as 'I chose to do this' and 'I don't have to' meant participants were more intrinsically motivated (i.e., greater autonomy). Whereas, a demand such as 'must' and 'have' is suggestive of little self-volition (i.e., reduced autonomy). Turner (2016) also point to the potential relationship between IBs and introjected regulation, whereby actions are self-imposed to avoid shame and guilt. Therefore, the core rational belief of a preference may determine a more autonomous and self-determined motivation (e.g., "I really would like to win, but that does not mean I have to"). In contrast IBs are comparable to internalised rules and demands placing pressure on individuals to behave in certain ways to avoid shame and guilt. Previous research has evidenced athletes who feared experiencing shame or guilt were less hopeful about their plans to meet their goals (e.g., Conroy, Willow, & Metzler, 2002). Further, in academic settings high levels of IBs were positively associated with high levels of extrinsic motivation (e.g., Eppler & Harju, 1997). Considering extrinsic introjected regulation has been positively associated with expending greater effort, yet related to higher anxiety and reduced coping ability (Turner, 2016) caution should be taken when inferring it as wholly adaptive/maladaptive without considering alternative variables and conditions.

In sum, the current findings contribute to the scant literature elucidating the motivational properties of irrational beliefs towards sporting performance. The thesis findings indicate rather than the intensity, the endorsement of IBs may influence the quality of one's motivation. Nevertheless, the precise association between irrational and/or rational beliefs requires greater examination. Not restricted to motivational consequences the effects of REBT on physiological markers were also examined.

8.2.2.4 Physiological Consequences. Extending previous research (e.g., Harris et al., 2006; Masters & Gershman, 1983) the present thesis examined the effects of REBT, and irrational and rational self-statements on objective physiological markers. First, Chapter four showed reductions in IBs were partially matched with short-term and maintained reductions in baseline measures of systolic blood pressure prior to a competitive simulation. This finding coupled with those put forth by Harris et al's (2006) may shed some light on the potential effects of REBT has on an athlete's physiological state prior to a competitive task, and the ramifications for long-term physical health benefits. Previous studies have evidenced the positive association between IBs and biological indicators of ill-health (i.e., disease related physiological responses, C-reactive protein, interleukin-6 tumor necrosis factor, and white blood cell counts; David & Cramer, 2010; Papageorgiou et al., 2006). Researchers also suggested that absolutistic and rigid thinking leads to rises in systolic blood pressure (SBP) defined by increases in peripheral vascular resistance (i.e., autonomic rigidity), whereas flexible and preferential thinking to associate with reductions in systolic blood pressure (Harris, et al., 2006). Therefore, mental rigidity (IBs) and mental flexibility (RBs) leads to autonomic rigidity (higher SBP) and autonomic flexibility (lower SBP) respectively. Whilst having ramifications for an athletes' physiological health the precise association and effects of rational and/or irrational beliefs required greater and concerted investigation.

In terms of performance implications (e.g., aviation settings) previous research showed basic cardiovascular measures (e.g., heart rate and blood pressure; Mehler, Reimer, Coughlin, & Dusek, 2009) to increase when placed under greater cognitive demand or workload. Within Chapter four reductions in both IBs and SBP may signify participants were under reduced cognitive demand and/workload. Although plausible the precise effects of REBT and one's beliefs on physiological indicators of performance, more specifically task demands required further investigation. Using heart rate as a useful index of mental

workload (Mehler et al., 2009) the results from Chapter six showed no differences in heart rate change scores when adopting irrational and rational self-statements prior to both hazard perception and breath-holding tasks. Instead the results showed similar increases in heart rate across both conditions, pointing to the notion that the adoption of irrational compared to rational self-statements did not result in heightened task demand as previously hypothesised (Brookhuis & DeWaard, 2001).

The current findings indicate changes in beliefs may be matched with physiological markers, whereby reduced IBs signify physical ill-health. However, the adoption of self-statements appeared to have no effect on an individual's mental workload, as indicated by changes in heart rate prior to a competitive task. Research into Type A coronary – prone behaviour may exemplify the adaptive influence of IBs on acute performance, similarly the cost to long-term implications for their physical health (Browne, Dowd, & Freeman, 2010). For example, a study by Smith and Brehm (1983) reported positive correlations in Type A behaviours with achievement related IBs (i.e., “One should be thoroughly competent and achieving in all possible respects if one is to consider oneself worthwhile”), as well as outcomes that facilitate goal achievement. These include: adaptive coping behaviours (i.e., address problems rather than avoid), high levels of motivation, and feelings of near constant time-pressure. However, Type – A behaviours are also positively associated with high levels of hostility, perfectionism, and coronary heart disease (CHD; Browne et al., 2010).

Physiological data from this thesis highlights the value of objective measures to examine the effects of REBT and IBs and/or RBs on physical health, and may also offer an objective measure of functionality in the pursuit of achievement goals. In development future studies are recommended to use established physiological measures predictive of performance (e.g., cardiovascular indices of challenge and threat; Blascovich, Seery,

Mugridge, Norris, & Weisbuch, 2004) to better ascertain the effects of irrational and/or rational beliefs on performance.

8.2.3. An alternative view of rationality.

8.2.3.1 Practical and factual rationality. Moving beyond previous research the thesis findings counter the polarised view that IBs much like psychological health are inherently detrimental for acute performance. In experiment one participants reported the adoption of rational self-statements were more helpful towards motor-skill performance compared to irrational self-statements. On the contrary participants reported no differences in perceived helpfulness of self-statements in reference to the hazard perception and breath-holding task. The findings from Chapter seven also suggested for some IBs were helpful for athletic performance. Anecdotal accounts from sport suggest elite athletes are forthcoming with their perceptions that IBs may serve adaptive qualities towards performance and facilitating goal achievement. A quote by Bill Shankly² eloquently highlights a common sentiment held by some athletes in elite sport: “Some people think that [European] football is a matter of life and death. I don’t take that attitude. I can assure them it is much more serious than that” (Schiera, 2007; p. 2). Indeed, Turner and Barker (2014a) allude to the notion that IBs could harbour motivational qualities for athletes. For example, the belief “I must become world champion, otherwise it would be terrible, and impossible to tolerate” may act as a motivational driver, ensuring athletes are able overcome various set-backs they will inevitably encounter. Closer inspection into the categorisation of irrational and rational beliefs may further elucidate this phenomenon.

² A famous English Football League manager who transformed the fortunes of a second division football club into one of the finest of its generation, winning three first division titles, two FA cups, and the UEFA cup titles.

According to REBT theory (Ellis & Dryden, 1997) when encountering adversity, irrational and rational beliefs are categorised in terms of the functionality of emotional and behavioural towards ones respective goals (DiGiuseppe et al., 2014). Central to the ABC(DE) model is the disputation phase. Here, IBs are disputed against three separate criterion: empirical, logical, and pragmatics, hence the theory of REBT makes two suppositions. First, all RBs are empirical, logical, and pragmatic (i.e., helpful), whereas IBs are not. Second, if a belief is empirically true then we may assume it is helpful towards goal achievement. However, in the context of elite sport and performance, it is apparent that to be successful or enhance performance one may not necessarily have to harbour beliefs that are empirically and logically true, yet can be useful in achieving their goals. For example, a soldier who regards their enemy as completely terrible may be more motivated towards achieving their goals (Wilson, 2010). Under conditions of social evaluative threat the IBs “I must win, I cannot tolerate losing, otherwise it would be terrible” may enhance effort and the performance in a distant runner during the final stages of a race (Turner, 2016). Alternatively, a dogmatic and irrational demand to perform optimally during a soccer penalty-kick may hinder performance due to the nature of the skill. For example, the conscious processing hypothesis (CPH; Masters, 1992) has been put forth to explain paradoxical performance breakdown (Gucciardi & Dimmock, 2008). The CPH explains that in important sporting situation athletes will reinvest in their explicit knowledge and control strategies characteristic of novice performers to sustain performance. In turn, we may hypothesise the endorsement of IBs may increase an athlete’s conscious reinvestment that will debilitate their ability to execute a skill inextricably related to the outcome (goal or no goal). Therefore, the detrimental effects of IBs on performance when under high social evaluative threat maybe more pertinent to discrete (i.e., penalty kick) and serial skills (i.e., triple jump) rather than continuous skills (i.e., running). Ultimately, during acute performance contexts additionally

to individual differences in ones perceived coping resources; the context and type of skill may in part determine whether the endorsement of IBs help or hinder an athlete's ability to perform. Understanding such distinctions in practical and factual rationality appear to be paramount in performance contexts where athletes may un/intentionally depart from factual towards practical rationality in the pursuit of performance excellence.

8.2.3.2 Cognitive dissonance. In Chapter three both measures of IBs and RBs were collected within the case study. However, due to unacceptable reliability scores within the SGABS, in Chapters four, five, and six only IBs were recorded. The theory of REBT conceptualise both RBs and IBs as bipolar constructs. To explain, early research investigating the relationship into ones' core beliefs conceptualised high RBs as low levels of IBs, placing them on two ends of a bipolar spectrum (Ellis et al., 2010). For example, we would assume high levels of RBs in an individual who reported low levels of IBs, however, recent research claims that irrational and rational beliefs are orthogonal to one another and represent different constructs (e.g., David et al., 2002; David & Szentagotai, 2006), as such high levels of RBs would not necessarily indicate low levels of IBs.

Turner (2016) compared the occurrence of harbouring both irrational and rational beliefs to double-thinking (Orwell, 1990). That is the power of holding two contradictory beliefs in one's mind simultaneously whilst accepting both of them. In elite sport athletes may also 'double-think and tell deliberate lies (i.e., empirically not true) whilst genuinely believing in them to help cope and manage challenges inherent towards success. Here athletes forget any fact that had become inconvenient and to only draw it back from the unconsciousness when it is then needed. For example, superstitions are typically viewed as a frivolous consequence of IBs (e.g., I must complete my usual routine, otherwise it would be terrible), yet many athletes rely on superstitious thoughts and practices during competition. Here athletes will knowingly tell themselves deliberate lies, in that a particular action or

process is inherently associated with the outcome of their performance. Researchers have evidenced the positive effects of superstition on athletic performance (e.g., Damisch, Stoberock, & Mussweiler, 2010), signifying the presence of an irrational yet adaptive belief. In terms of REBT theory, an athlete who endorses the irrational belief “I would like to win, therefore I must” denies the existence of objective reality whilst taking into account the reality in which one denies. This cognitive dissonance is not only purported to be helpful for athletes within performance contexts, but considered indispensable, necessary, and provides the foundations for human’s existence today (Harari, 2014). To illustrate, an athlete may broadly endorse a rational philosophy towards life, and thus able to manage and respond functionally to the adversities they may encounter in life. Nonetheless, when operating in what a highlighting demanding and pressurised domain of high performance sports, athletes may inadvertently make an irrational shift from ‘want to’ to ‘have to’ (Botteril, 2005). It seems that whilst ones beliefs are engrained and proposed to act as generalised beliefs, they maybe contextually dependent and thus the endorsement of IBs and RBs may fluctuate accordingly.

Contrary to previous research the data indicates no distinctions in performance and associated outcomes when adopting irrational and rational self-statements prior to an acute competitive task. As suggested previously (e.g., Turner, 2016) the findings from Chapters three, four, and six indicate that IBs may determine the quality of ones motivation rather than intensity. Furthermore, in contrast to REBT theory, a nuanced and more complicated perspective into the effects of irrational and rational beliefs on behavioural performance has been put forth, using a variety of explanations (i.e., secondary appraisals, practical rationality, and cognitive dissonance). In sum, the dichotomous effects of IBs and RBs on human functioning and performance may offer an over simplified view, especially within the high-performance context of elite sport. Here, the extreme, dogmatic responses typified as

maladaptive for one's psychological health, may in turn harbour facilitative effects for performance. Based on the present findings the precise effects of beliefs on acute performance and associated outcomes may be a function of both contextual (e.g., type of task) and idiosyncratic factors, in turn determining the functionality of emotions, cognitions, and behavioural consequences. Ultimately, further and more systematic research into the mechanisms by which irrational and/or rational beliefs effect actual performance and important outcomes indicative of superior performance is warranted.

In summary, the present thesis reports a modest and nuanced examination into the effects of REBT as an intervention to enhance the psychological, physiological, and performance outcomes. Using the context of elite sport this thesis provided an applied examination demonstrating that if delivered effectively REBT provides an effective means to reduce IBs, that for some enhanced athletic performance (actual performance & competition simulation scores). Partially supporting previous research findings indicated for some reductions in IBs were associated with improved physiological measures (i.e., reduced systolic blood pressure). Whilst suggesting the effective application of REBT may offer a fruitful intervention to enhance athletic performance, as well as psychological health, a more rigorous and controlled examination in Part II indicated that for some an irrational approach to an acute competitive task may not hinder performance as previously hypothesised. (i.e., performance scores, eye-gaze data). Indeed, these findings have implications for REBT theory, highlighting distinctions in factual and practical rationality that have been overlooked in previous research. The notion that for some IBs may facilitate acute performance should be considered seriously. Considering the applied implications for practitioners looking to use REBT as a performance enhancing intervention, plausible explanations by which beliefs may influence performance were also discussed (i.e., practical/factual rationality, motivational quality, acute & long-term effects, & cognitive dissonance). As alluded to by previous

researchers (e.g., David et al., 2002; Ziegler, 2001) the cognitive appraisal theory may offer a validated and established theory to help elucidate the precise effects of irrational and/rational beliefs on emotional, behavioural, and performance consequences to adversity.

8.3 Implications for practice.

In the previous section various theoretical and conceptual explanations have been offered to understand: the conditions in which under IBs and RBs effect performance, and the associated outcomes during an acute performance task. However, it is important to consider the applied implications for practitioners working within high performance contexts. Whilst an irrational approach may not hinder performance during an acute performance task as previously suggested, the data does not indicate IBs are more helpful than that of rational alternatives. There also exists a plethora of evidence supporting the detrimental effects of IBs (depression, anxiety, anger; Visla et al., 2016) and beneficial effects of REBT on psychological health (e.g., Engles et al., 1993; Gonzalez et al., 2004; Lyons & Woods, 1991). The detrimental effects of IBs on sychological health has important implications for those operating in high performance settings, who are required to function within a context inherent with stressors. Questions are asked to the long-term implications for those who highly endorse an irrational philosophy and the subsequent effects on their ability to perform.

To explain, researchers have proposed four categories of stressful events (i.e., adversity) that one may encounter (e.g., Elliott & Eisdorfer, 1982; Meichenbaum, 2007). First, stressors can be acute and time-limited, comparable to the completion of certain skills in sport (e.g., penalty kick, important golf-putt. Second, A sequence of stressful events, that give rise to a series of challenges that may follow from one significant adversity. Third, chronic intermittent stressors, such as repeatedly being evaluated and on-going competitive performances. Fourth, chronic continual stressors, that is the continuous exposure to pro-

longed distress, common in professions inherent with occupational dangers (i.e., police, military).

Acknowledging the inherent demands of performance contexts, specifically within elite sport, there exists a high prevalence of organisational stressors and stigma towards accessing service provision. Accordingly, researchers suggest not only is elite sport demanding, but also a setting that places the mental welfare of athletes at risk (e.g., depression, eating disorders, unhealthy lifestyle behaviours; Hughes & Leavey, 2012; Roberts, Faull, & Tod, 2017; Pisarek, Guskowska, Zagorska, Lenartowicz, 2011). To this end, the notion that a practitioner would advocate and reinforce IBs in an athlete to actively help performance would be both unethical, ineffective, and breach the professional codes of conduct adhered to by registered practitioners (BPS, 2009). Much of the contemporary research posits athlete wellbeing and performance are inextricably linked (Lindsay, 2016). Therefore, the application of REBT has long-term implications not only for an athlete's wellbeing, as well indirectly providing the foundations for sustained performance. To corroborate this point, research has evidenced the endorsement of IBs predict increased emotional and physical exhaustion (a dimension of burnout) in elite Gaelic footballers (Turner & Moore, 2015).

REBT was originally developed as an intervention to treat clinical disorders within therapeutic settings (Ellis 1957), where now much like the new wave of psychological interventions introduced to the context of elite sport (e.g., EMDR, Acceptance Commitment Therapy, Motivational Interviewing) its application has, and is receiving increased attention within the literature. In the next section practitioner insights into the effects and application gleaned from part one of the thesis are discussed.

8.3.1 Maintenance effects of REBT. Data from Chapters three and four extend the contributions from Turner and colleagues, providing an idiosyncratic and ecologically valid

examination into the effects of REBT on actual athletic performance and important associated outcomes (e.g., anxiety, approach orientations, self-efficacy). Notably, Chapters three and four are the first studies to demonstrate meaningful reductions in IBs were associated with immediate and maintained reductions in IBs were also coupled with increased self-efficacy and perceptions of control, greater reductions in avoidance goals, and for some participants improved athletic performance. Such long-term changes were maintained at three, six (Chapter three), and nine-month (Chapter four) follow-up time-points. Social validation data also reported increased inter-relations with teammates and enhanced ability to cope with personal stressors, indicating the benefits of the REBT intervention transcends the sporting context and thus REBT may also offer in-direct benefits for athletic performance. To explain these findings two explanations are put forth.

First, REBT is distinct in that the disputation process accesses underlying and deep-rooted IBs that are often at the core of psychological disturbances (Dryden & Branch, 2008). Hereby, the process of REBT promotes a rational philosophy that is applicable not only to sport settings but also across more general aspects of one's life (Turner, 2016). Therefore, compared to typical cognitive behavioural techniques (the canon; Anderson, 2009) used within sport, the displacement of IBs with rational alternatives will bring about fundamental changes in an athlete's ability to approach, manage, and function when encountering adversity (Dryden & Neenan, 2015). Second, we hypothesise the ABC(DE) model (Ellis & Dryden, 1997) and REBT process (education, disputation, & reinforcement phase; Turner & Barker, 2014) provided athletes with a comprehensive understanding and greater autonomy over their feelings and behaviours. On the basis REBT is effectively delivered, athletes are provided with tools to autonomously reaffirm a new rational philosophy. Subsequently, the practitioner becomes somewhat redundant allowing the athlete themselves to manage deal with the demands they will inevitably encounter.

8.3.2 Structured intervention. In Chapter three the participant received seven one-to-one sessions (60 minutes each), whereas, in Chapter four the intervention dose was reduced down to five one-to-one sessions (30 minutes each). In-line with previous research (e.g., Turner & Barker, 2014; Gonzalez et al., 2014) the findings support a dose effect, whereby REBT is most effective when provided with enough time to progress through the REBT process. In Chapter four due to time and access constraints one participant received two out of the intended five sessions REBT sessions, as a result the participant reported no changes in their endorsement of IBs. Nevertheless, greater number of sessions did not necessarily indicate greater effect, as reported in Chapters four, whereby participants received the same intervention dose yet reported varied reductions in IBs. Ultimately, when applying REBT on a one-to-one basis it would be prudent for practitioners to consider the available time-scale, as well match the pace to meet the participants needs (Dryden & Neenan, 2015).

8.3.3 Preventative intervention. Not merely restricted to resolving psychological issues, it is also worth noting in Chapter four REBT was delivered to the entire cohort of athletes rather than screening those who reported high levels of IBs. Data showed the positive effects of REBT were not restricted to those with ‘identified problems’ but also may be applicable and valuable for those with lower scores of IBs (total IBs < 2.51; Lindner et al., 1999). This notion aligns with previous researchers (Gonzalez et al., 2004) who after conducting a meta-analysis into the effects of REBT reported it to be as effective as a preventative as well as a re-active and problem focused intervention. This has important and valuable applied implications for providing psychological support to children and adolescents, as well as the use of workshops to reinforce a rational philosophy in those who may not necessarily already endorse high levels of IBs.

8.3.4 Modality. Building on previous research studies (e.g., Turner et al., 2014; Turner et al., 2015) Chapter five examined the effects of a single REBT workshop on IBs,

pre-performance anxiety, and penalty-kick performance in elite blind football players. Similarly, to previous research participants reported only acute but not maintained reductions in IBs (e.g., Turner et al., 2014). However, the lack in meaningful reductions in IBs may not be attributed to the modality. Rather, insufficiencies in duration may have detrimental effects on rapport building and the constructive collaboration between the practitioner and the athlete (Dryden, 2006). To support this notion, previous research examining the effects of a series of REBT workshops showed maintained and meaningful reductions in IBs and psychological measures. For example: increased perceptions of control (Bernard, 1985), directional shifts in trait and state anxiety (Larner et al., 2007), and long-term reductions in demand for fairness and a need for achievement (Turner et al., 2015). Notably, social validation data from Chapter five and practitioner reflections in Chapter seven allude to positive benefits of REBT using a workshop format. These included, the normalisation of concerns regarding competition, shared understanding into teammates perspectives, vicarious learning, and modelling teammates coping techniques. Indeed, it was hypothesised in Chapter five that such benefits may be explained by adjustments to a 'typical' REBT workshop (e.g., Turner & Barker, 2014a). To illustrate, the workshop protocol mirrored that of Personal Disclosure Mutual Sharing (PDMS; Holt & Dunn, 2006), whereby each player was in-turn asked to consider and disclose examples of an ABC model. This may have resulted in enhancing the closeness, understanding, and communication between the team mates (Windsor et al., 2011). Accordingly, Vertopoulos and Turner (2017) examined the effects of a REPDMS session with a group of elite Greek adolescent athletes, reporting reductions in IBs and RBs, as well as supporting its efficacy as an intervention with athletes. In sum, contributing to existing research the format of a workshop offers a fruitful format to promote a rational philosophy when working with teams. Although the findings indicate a single-session is insufficient in

bringing about maintained reductions in beliefs, the integration of PDMS may offer benefits at a team, as well as a personal level.

8.3.5 Athletes with a disability. The current thesis contributes to the scant research that examines the effects of psychological interventions with athletes with a disability (Barker et al., 2013). Furthermore, this is the first study to systematically examine the effects of REBT within a specialised population of elite Paralympic athletes. Aligned with recent recommendations practitioner reflections gleaned in Chapter five concluded although there are more similarities than differences (Arnold et al., 2016; Dieffenbach & Statler, 2012), there are intricacies and considerations to be made when working with elite athletes with a disability. First, practitioners are recommended to reflect on their own biases and preconceptions when working with athletes with a disability, thus finding a balance between allowing athletes autonomy, whilst making the necessary adjustments to meet their inherent needs. Second, whilst the content of the interventions may invariably remain the same greater consideration should be given into the delivery of the intervention (e.g., format, pace, and resources). In most cases the athletes' themselves suggested the most appropriate delivery style that suited their needs. For example, in Chapter five, the use of an audio recording was used to supplement the workshops. Furthermore, the use of technology seems to have surpassed the use of traditional and labour intensive methods (i.e., braille). Finally, within Chapter four the lead sport psychologist highlighted the inherent complexities of some of athletes with a physical disability. Taking a client-centred approach practitioners should be sensitive as to whether the athletes' disability is congenital or acquired as this has implications for the individual's psychology. Indeed, researchers indicate individuals with a physical disability are at greater risk to mental illnesses (i.e., depression) and reduced psychological functioning (Jensen et al., 2014). Subsequently, the application of REBT

appears to offer an effective and valuable intervention for practitioners looking to develop the psychological wellbeing and performance of elite athletes with a disability.

In summary, using the context of elite sport the findings of the thesis advocate REBT as an effective intervention to enhance performance and related outcomes with elite athletes. As such theoretical explanations have been put forward to hypothesise the processes between IBs and/RBs and emotional, behavioural, cognitive, physiological consequences, and ultimately performance. Further, the findings put forth an alternative view that an irrational compared to a rational approach may not hinder ones ability to perform during an acute competitive task. Nonetheless, considering the demanding nature of high performance settings it is postulated the endorsement of IBs will have debilitating ramifications for an athletes psychological wellbeing, in turn the ability to sustain long-term performances. Finally, the implications for professional REBT practice have been documented in reference to elite athletes and athletes with a physical disability.

8.4 Limitations

To meet the aims and objectives of this thesis a multitude of research methods were used. Notwithstanding the diversity, methodological and conceptual limitations have been identified that inform avenues for future theoretical and applied research within REBT. Within the experimental studies rather than using self-statements pertinent and individualised for each participant, generalised self-statements associated with the content areas of achievement were used to encourage irrational and rational approaches to a competitive and meaningful performance situation. Nonetheless, the experimental manipulations did not address the conceptual difference between self-statements and IBs and/or RBs as core beliefs (David et al., 2010). Overcoming previous shortcomings participants took part in a real-life rather than imagined competitive task. Despite this, the artificial use of ego-threatening instructions may have lacked genuine relevance and thus not an ecologically valid way to

examine the effects of irrational and rational beliefs on performance. Accordingly, future research may wish to screen and split participants into high and low levels of IBs to examine their effects on performance within both real-life and meaningful competitive settings.

The SGABS provided a reliable and validated measure of general core IBs (Lindner et al., 1991), however these beliefs were not specific to performance contents. Future researchers would be prudent to adopt a newly validated measure of IBs tailored for performance contexts, named the irrational Performance Beliefs Inventory (iPBI; Turner et al., 2016) to offer an accurate measure of performance specific beliefs. Statistical analysis of the rational belief subscale within the SGABS reported unacceptable values of alpha ($< .07$; Tavakol & Dennick, 2011) and was excluded from the present thesis. Accordingly the present thesis was almost exclusively focussed on IBs rather than RBs. Researchers put forth both irrational and rational beliefs are orthogonal to one another and represent different constructs (David et al., 2002; David & Szentagotai, 2006), therefore the presence of low IBs does not signify high levels of RBs. Future researchers are recommended to measure both RBs and IBs to further elucidate the complex interplay between ones beliefs (David, 2003) and the mechanisms by which it effects performance. In the past, the use of self-report measures to assess irrational and rational beliefs have received some criticism due to debates regarding the conscious accessibility of human beliefs (David et al., 2010; Macavei & McMahan, 2010). Although, alternative methods such as retrospective imagery, role-playing, imagery, and dysfunctional thought records have been offered as valid alternatives future research should consider the pragmatic compromise between the validity of assessment and labour intensity (see Macavei & McMahan, 2010 for a review).

Another limitation of the present thesis is the measurement of emotion (i.e., anxiety). The binary model of emotion as proposed within the REBT theory (Hyland & Bdouszek, 2012) suggests IBs lead to qualitatively distinct unhealthy negative emotions (e.g., anxiety,

depression) whereas RBs led to healthy negative emotion (e.g., concern, sadness). Although, research has put forth a functional measure of emotion (Mogoase & Stefan, 2013) it was deemed unacceptable due to first, low scoring reliability scores (Cronbach's alpha) and second, translational issues from Romanian to English. Therefore, if future studies wish to test the healthy vs. unhealthy distinction in emotion put forth by REBT researchers alternative or psychometric measures of emotion function require validation.

8.5 Future Researcher Directions

The findings from the present thesis provide a stimulus for future researchers, whereby theoretical and applied avenues are provided in the following section. First, whilst the various processes are discussed, the findings from the present thesis do not directly report the mechanisms by which IBs and RBs affect performance. Therefore, future researchers may wish to examine the precise mechanisms between IBs and/RBs, on consequences and actual performance with reference to the CAT, as well using appropriate statistical analyses techniques (mediation analysis; MacKinnon, Fairchild, & Fritz, 2007). Second, future researchers may wish to conduct a longitudinal study tracking fluctuations in IBs and/or RBs for those operating in high-performance settings. Accordingly, these findings will better elucidate and predict fluctuations in psychological wellbeing, performance, and sustained engagement within the respective field as a result of one's endorsement of irrational and rational beliefs. Third, concerning the nature of measurement, it is recommended future researchers overcome the inherent limitations of self-report measures, instead use measurement techniques to better objectify and glean valuable insights into the precise effects of one's beliefs over time. For example, these may include physiological (e.g., cortisol, cardiovascular indices, heart rate variability) performance (competitions scores), behavioural (attendance), and psychological measures (e.g., pupil dilation data). Fourth, humans are inherently irrational and rational beliefs. As such, the theory of REBT may

overlap and integrate with many topics within sport psychology that have previously been studied in isolation (e.g., performance, anxiety, & choking; Lindahl et al., 2015). Although in the current thesis, focus has been placed the effects of beliefs on anxiety and associated performance outcomes, athletes will experience variety of emotions in response to adversity that have implications for performance. For example, an irrational demand that “I must be treated fairly”, and “I cannot tolerate being disrespected by others” will lead to unhealthy anger, having ramifications for goal achievement. Considering the implications that a rational philosophy has on promoting healthy emotions, and adaptive behaviours researchers are advocated to widen the investigation into the effects of REBT across a variety of emotions (e.g., anger, shame, guilt), having implications for performance and psychological wellbeing. For example, REBT may offer significant psychological benefits for athletes during the injury rehabilitation process. Fifth, the area of resilience is a topical one (Fletcher & Sarkar, 2013), as such attention has shifted from examining risk to individual factors that allow performers to thrive encountering adversity. Indeed, researchers outline the similarities between REBT and the concept of resilience (Dryden, 2007), whereby those with a rational philosophy are better able to respond and overcome adversity compared to those with irrational alternatives. Specifically, within the context of elite sport emphasis is placed on what the performer brings rather than the experience itself as predictors of achievement (Collins, MacNamara, & McCarthy, 2015). Future researchers may wish answer the call for techniques to foster resilience (Fletcher & Sarkar, 2012) and continue the investigation that examines the effects of REBT and rational beliefs on resilient responses to adversity (athlete rational resilience credo; Turner, 2016). Recently, Deen, Turner and Wong (2017) conducted the first study and reported significant increases in self-reported resilient qualities after receiving five one-to-one REBT counselling sessions within five elite squash players. Finally, high performance settings are dynamic and ever changing that may constrain practitioners to

provide bespoke one-to-one psychology support. Here the demands are not restricted to athletes but also experienced by coaches (see e.g., Olusoga, Butt, Maynard, & Hays, 2010), and parents (see e.g., Harwood & Knight, 2009). As such, the application of REBT seems as applicable with coaches and parents to foster a healthy and rational development within themselves and their athletes and/or children. Indeed, researchers emphasise while not exclusively, beliefs are ‘socialised’ into an individual’s psychology through interaction with others (Slater & Turner, 2016). Therefore, the exploration into the methods by which practitioners can nurture rational environments/cultures that endorse rational views and values may offer a fruitful means of promoting psychological health and performance within organisations.

8.6 Conclusion

This thesis makes novel theoretical and applied contributions to the literature, exploring the use of REBT as an intervention to enhance performance and associated outcomes. Using the context of elite sport, the present thesis has reported the promising effects of REBT on important psychological, physiological, and actual performance outcomes using applied research methodologies. Furthermore, when using REBT on a one-to-one format the effect on IBs and associated outcomes (e.g., self-efficacy) were immediate and maintained, indicating fundamental and rational shifts in the way participants responded to adversity. On the contrary, the application of REBT using a single-session workshop modality were mixed. These findings highlight the effective application of REBT may require a greater number (i.e., dose response) of individualized support (i.e., 1-2-1). Future researchers may wish to explore pro-active and elegant means by which practitioners can foster an environment conducive encouraging those who operate within (e.g., coaches, support staff, & athletes) to adopt rational view of adversity (i.e., failure, rejection, or poor treatment). Notably, using an applied experimental research design results in the present

thesis shows no distinction in psychological (anxiety), physiological (heart rate), cognitions (eye gaze data), and performance outcomes (BHT and HPT) between irrational and rational approaches to an acute competitive task. Thus, for the first-time results suggested an irrational approach may not hinder acute performance in comparison to a rational approach. These findings offer a nuanced view between IBs/RBs and maladaptive/adaptive responses to adversity, marking an unexpected but welcomed shift in REBT research; overcoming what appears to be an overtly simplistic dichotomy depicted within previous literature. Indeed, the relationship between IBs/RBs and acute performance maybe more complicated than what previous research has purported. In light of these findings it would be prudent for practitioners to acknowledge the inherent demands in performance settings, the long-term benefits of REBT on performance related outcomes, and the detrimental effects of IBs on psychological health. Finally, contributing to the scant professional practice literature, valuable insights into the effective application of REBT with elite athletes and those with a physical disability were discussed. By no means a panacea for psychologists, the findings contribute to a growing literature demonstrating the positive effects of REBT on performance, as well as psychological health. Alongside the growing organisational and public interest within sport psychology the current findings contribute to a vibrant wave of psychological approaches at a practitioner's disposal, breaking the shackles of 'typical' psychological delivery and providing the impetus for continued development of sport and/or performance psychology.

Albert Ellis eloquently states 'there are three musts that hold us back: I must do well, you must treat me well, and life must be easy'. All humans are inherently irrational, and of course rational beings, and those who operate in high performance domains are no exception. Evidence supporting the detrimental effects of "demanding success and awfulizing the consequences of failure" in the pursuit of goals although mounting appear to be more

nuanced than previously theorized. Much remains to be learned regarding REBT application and the precise effects of IBs and/or RBs on performance across settings, offering an exciting and impactful avenue for future enquiry.

Chapter 9

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