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The psychology of the yips and lost move syndrome in sport.

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The psychology of the yips and lost move syndrome in sport.

by

Jennifer Emily Bennett

A thesis submitted in partial fulfilment of the requirements of Sheffield Hallam

University for the degree of Doctor of Philosophy

December 2015

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Abstract

There has been growing interest in a specific type of performance problem that sees individuals lose the ability to execute a previously automatic skill they once performed at ease (Klampfl, Lobinger & Raab, 2013; McDaniel, Cummings & Shain, 1989). Such severe performance problems have been described in the sport psychology literature with disparity; for example in artistic sports this type of affliction is referred to as *lost move syndrome* (LMS; Day, Thatcher, Greenlees & Woods, 2006), whereas in golf and cricket individuals are said to suffer from the *yips* (Bawden & Maynard, 2001). The underlying mechanisms of these problems have caused much debate, and despite similarities between the two they have been classified independently. The primary aim of this thesis was to adopt a triangulated approach to delineate the psychological nature of the yips and LMS, and determine the extent to which they are similar. Based on these findings a second aim was to develop an intervention to treat the yips and LMS. Study one adopted a qualitative approach utilising semi-structured interviews to explore the psychological components of the yips and LMS. Study two involved quantitative analysis of psychometric data assessing perfectionism, rumination, reinvestment, and subjective stress response to the yips and LMS among affected individuals. Finally, study three utilised a case study approach to evaluate the effectiveness of an intervention designed to treat the underlying psychological components of the yips and LMS. This study included reflective narratives gathered throughout the treatment process, and semi-structured interview data collected on completion. Results of study one indicated that several emotional and cognitive components underpin the yips and LMS, including anxiety, fear, panic, frustration, hypervigilance, and loss of cognitive control. Social functioning was similarly disrupted with avoidance, obsessive behaviour, and intrusive thoughts. Study two revealed higher levels of perfectionism, rumination, reinvestment, and stress response equivalent to minor trauma experience, associated with the yips and LMS. Similar characteristics were evident across both yips and LMS groups, with the exception of observable movement disruption concerning the nature of the skills affected (e.g., putting stroke in golf/somersault in diving), however both yips and LMS affected individuals reported involuntary muscle tension, shaking, spasms, and loss of physical control. Importantly, these components are also evident throughout research exploring anxiety-based disorders. A recent theme emerging in association with the yips and anxiety-disorders is the involvement of significant life-events prior to problem development. The current results also indicated that significant-events had occurred before, and around the time of the yips/LMS experience. The final study adopted a case study approach in which *eye movement desensitisation and reprocessing* (EMDR; Shapiro, 1989) and exposure therapy were integrated in a treatment plan designed to treat a yips-affected golfer and a LMS affected diver. EMDR facilitated the identification and reprocessing of significant life-events associated with the problem, exposure therapy addressed associated psychological symptoms of anxiety, avoidance, and rumination. Evaluation of the intervention showed that both athletes had improved performance of the affected skills, and levels of anxiety and physical movement disruption had substantially reduced. Interview data collected on completion of each intervention confirmed that avoidance behaviour, obsessive habits, hypervigilance, and intrusive thoughts had also been alleviated, and both athletes had improved performance in training and competition. Extensive triangulated findings provided in this thesis suggest that the yips and LMS are psychological disorders, the basis of which is anxiety, and that significant life-events might lead to their development. It is recommended that the generic term *performance block* be adopted for future classification of these problems as similar forms of an anxiety-based disorder. From a theoretical perspective, the findings emphasise the psychological nature of these problems, and importance of considering potential vulnerability factors in future research. From a practical perspective, this thesis highlights the importance of adopting an individualised approach to the assessment of these issues, and developing interventions to treat the psychological components involved.

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Table Of Contents

CHAPTER I	1
1.0 Introduction	2
1.1 Purpose of this thesis	4
1.2 Structure of this thesis	4
CHAPTER II	6
2.0 Review of literature	7
2.1 Introduction	7
2.2 Performance breakdown in sport: The yips	8
2.2.1 Definition	8
2.2.1.1 Choking	10
2.2.1.2 Dystonia	12
2.2.2 Underlying components of the yips	15
2.2.2.1 Anxiety	15
2.2.2.2 Significant life-events	17
2.2.2.3 Personality characteristics	19
2.2.3 Diagnosis	24
2.2.4 Treatment methods	25
2.3 Performance breakdown in sport: Lost Move Syndrome	26
2.4 Future research directions	28
2.4.1 Identification of the underlying psychological components	29
2.4.2 Establishing individual susceptibility	29
2.4.3 Development of effective treatment methods	30
2.5 Summary of the literature review	31

CHAPTER III **32**

3.0 Study one	33
Yips and Lost Move Syndrome: Exploring Psychological Symptoms, Similarities and Implications for Treatment	
3.1 Introduction	33
3.2 Aims of study one	36
3.3 Method	37
3.3.1 Participants	37
3.3.2 Procedure	38
3.3.3 Interview schedule	39
3.3.4 Analysis	40
3.4 Results	41
3.4.1 Emotion	42
3.4.2 Cognition	43
3.4.3 Physical	45
3.4.4 Wider impact	46
3.5 Discussion	52
3.6 Summary and concluding remarks	59

CHAPTER IV **61**

4.0 Study Two	62
Yips and Lost Move Syndrome: Assessing Impact and Exploring Levels of Perfectionism, Rumination and Reinvestment	
4.1 Introduction	62
4.2 Aims of study two	65
4.3 Method	66

4.3.1	Participants	66
4.3.2	Procedure	67
4.3.3	Psychometric measures	68
4.3.3.1	Frost Multidimensional Perfectionism Scale	68
4.3.3.2	Ruminative Response Scale	69
4.3.3.3	Reinvestment Scale	69
4.3.3.4	Impact of Event Scale	70
4.3.4	Analysis	71
4.4	Results	71
4.5	Discussion	75
4.6	Summary and concluding remarks	80
4.7	Future research directions	81
CHAPTER V		82
<hr/>		
5.0	Study three	83
Treatment of the yips and LMS: The use of Eye Movement Desensitisation and Reprocessing with Exposure		
5.1	Introduction	83
5.2	Review of literature	85
5.2.1	Aetiology of anxiety based disorders	85
5.2.1.1	The impact of significant life-events and trauma	88
5.2.2	Treatment methods for anxiety-based disorders	90
5.2.2.1	Emotional Freedom Technique	91
5.2.2.2	Brainspotting	95
5.2.2.3	Eye Movement Desensitisation and Reprocessing	96

5.2.2.4 Trauma-Focussed Cognitive Behavioural Therapy	98
5.2.3 Section summary	99
5.3 Aims of study three	100
5.4 Design	100
5.4.1 Participants	101
5.4.2 EMDR protocol	102
5.4.3 Pre- and Post-intervention performance measures	104
5.4.3.1 Prevalence of LMS	104
5.4.3.2 Prevalence of the yips	105
5.4.3.3 Subjective Units of Distress	105
5.4.3.4 Impact of Event Scale	106
5.4.3.5 Social validation	106
5.5 Case report one	109
5.5.1 Athlete A	109
5.5.1.1 Background	109
5.5.2 Therapist A	110
5.5.3 Intervention	111
5.5.3.1 EMDR protocol	112
5.5.3.2 Exposure therapy	113
5.5.3.3 Session one	113
5.5.3.4 Session two	116
5.5.3.5 Session three	119
5.5.3.6 Session four	120
5.5.3.7 Session five	121
5.5.3.8 Session six	122

5.5.3.9 Session seven	123
5.5.3.10 Session eight	124
5.6 Intervention evaluation	126
5.6.1 Performance success	126
5.6.2 Subjective Units of Distress	127
5.6.3 Reflections on intervention	127
5.7 Conclusions	130
5.8 Case report two	132
5.8.1 Athlete B	132
5.8.1.1 Background	132
5.8.2 Therapist B	134
5.8.3 Intervention	134
5.8.3.1 EMDR protocol	135
5.8.3.2 Exposure therapy	135
5.8.3.3 Session one	136
5.8.3.4 Session two	139
5.8.3.5 Session three	141
5.8.3.6 Session four	143
5.8.3.7 Session five	144
5.8.3.8 Session six	145
5.8.3.9 Session seven	146
5.8.3.10 Session eight	148
5.8.4 Intervention evaluation	150
5.8.4.1 Performance success	150
5.8.4.2 Subjective Units of Distress	150

5.8.4.3 Kinematic data	151
5.8.4.4 Reflections on intervention	153
5.9 Conclusions	156
5.10 Discussion	157
CHAPTER VI	167
6.1 Introduction	168
6.2 Summary	168
6.3 Discussion	170
6.3.1 Conceptualisation of the yips and LMS	172
6.3.2 Practical implications	176
6.4 Conclusions and recommendations for future research	178
6.4.1 Thesis limitations	180
6.5 Summary and concluding remarks	180
REFERENCES	183
APPENDICES	209

LIST OF FIGURES

Figure	Title	Page No.
CHAPTER THREE		
3.1	Higher-order, lower-order, and raw-data themes outlining psychological characteristics associated with the lived experience of the yips and LMS	49-51
CHAPTER FIVE		
5.2	Pre-intervention data illustrating face rotation angle and face rotation angular velocity for putts from 0.91 m / 3 feet (1a & 1b) and 1.22 m / 4 Feet (1c & 1d). Data is shown from the top of the backswing to the finish of the stroke, vertical line indicating impact.	152
5.3	Post-intervention data illustrating face rotation angle and face rotation angular velocity for putts from 0.91 m / 3 feet (2a & 2b) and 1.22 m / 4 Feet (2c & 2d). Data is shown from the top of the backswing to the finish of the stroke, vertical line indicating impact.	152

LIST OF TABLES

Table	Title	Page No.
CHAPTER FOUR		
4.1	Means (M) and Standard Deviations (SD) for Group x Dependent Variable	73
CHAPTER FIVE		
5.2	Situations attached to increased amounts of anxiety experience where SUD score of 0 = no anxiety experienced; and SUD score of 10 = extreme anxiety.	115
5.3	Situations attached to increased amounts of anxiety experience where SUD score of 0 = no anxiety experienced: “feeling the speed of my arms, control of my arms, and inner calmness”; and SUD score of 10 = extreme anxiety: “electric shock in my arms, not in control of my arms, intense anxiety inside”).	138

LIST OF APPENDICES

Appendix	Title
1	Timeline of the thesis
2	Ethics approval study 1 Informed consent form Participant information sheet Risk assessment
3	Interview guide study 1
4	Sample raw data from study 1
5	Ethics approval study 2 Participant information sheet Risk assessment
6	Frost Multidimensional Perfectionism Scale
7	Reinvestment Scale
8	Ruminative Response Scale
9	Impact of Event Scale
10	Sample raw data output study 2
11	Ethics approval study 3 Informed consent form study 3
12	Interview guide study three: Athlete Interview guide study three: Coach Interview guide study three: EMDR Therapist Interview guide study three: Sport Psychologist

PEER REVIEW WORK RELATED TO THIS THESIS

Publications:

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Bennett, J., Rotheram, M., Hays, K., Olusoga, P., Maynard, I. W., & Lindsay, P. (in press). Yips and lost move syndrome: Assessing impact and exploring levels of perfectionism, rumination and reinvestment. *Sport and Exercise Psychology Review*.

Conference Presentations:

Bennett, J., Hays, K., Lindsay, P., Olusoga, P., & Maynard, I.W. (2014). Yips and lost move syndrome: Exploring psychological symptoms, similarities, and implications for treatment. Research paper poster presented at the Association for the Advancement of Applied Sport Psychology Annual Conference. Las Vegas, October 2014.

Bennett, J., Hays, K., Rogers, A., Olusoga, P., & Maynard, I. W. Preliminary evidence for the treatment of performance blocks in sport: The efficacy of eye movement desensitisation and reprocessing with exposure treatment. Thesis research poster presentation at the Division for Sport and Exercise Psychology Annual Conference. Leeds, December 2015.

GLOSSARY OF TERMS

Anxiety	Characterised by feelings of tension, worried thoughts, and somatic symptoms. Apprehension associated with experiencing fear in the future
Conversion	The manifestation of psychological distress as physical symptoms
Choking	An acute decrease in performance when self-expected standards are normally achievable, which is the result of increased anxiety under perceived pressure
Dystonia	A neurological movement disorder characterised by involuntary muscle contractions
Less-conscious	Thoughts feelings and behaviours generated from areas of the brain outside conscious awareness
Lost Move Syndrome	The sudden inability to perform a movement previously executed without concern
Obsessional behaviour	A dispositional preoccupation with an unwanted behaviour, often performed as a form of coping with distressing emotion
Perfectionism	A dispositional propensity for setting unrealistically high standards, and dissatisfaction with achieving anything else
Performance block	Anxiety-based movement disorder causing loss of control, fear, hypervigilance, muscle tension, spasms and shaking
Psychogenic	Something of psychological origin
Reinvestment	A personality trait associated with conscious processing under stress
Rumination	Excessive thoughts usually directed towards negative, self-critical appraisal of a past event, and/worry over future events
Significant event	An overwhelming emotional event
Trauma	An emotional response to an overwhelming event perceived as threatening by the individual concerned
Yips	Sudden breakdown in movement occurring during attempted execution of finely controlled motor behaviour

CHAPTER I

1.0 Introduction

The 2001 Cheltenham and Gloucester (C&G) trophy final will be remembered as the fateful day that ended former first-class bowler Scott Boswell's professional playing career. He described how, on 1st September 2001, as he stepped up to bowl his head started to swim: "...the [batsman] looked 50 yards away, I just couldn't see him, then I bowled a wide, I heard the noise of the crowd, I bowled a second wide". With tense fingers, tightening muscles, and uncontrollable sweating Boswell could not release the ball, as the pitch sloped away beneath him somewhat like vertigo.¹ When he thought it could not possibly get worse, he froze. Two weeks later he was dismissed. For years following that day, Boswell was haunted by the experience that left him unable to do something he had, until that point, been doing everyday of his life almost automatically. Although he is now able to talk openly about his experiences, the memories of that day remain vivid and painful, a trauma he has relived ever since.

In recent years there has been increasing reference to performance problems characterised by severe disruption to physical movement control. Involuntary muscle contractions, freezing, spasms, locking of limbs, loss of control/ awareness, and extreme skill failure, have all been reported within the literature (e.g., Day, Thatcher, Greenless & Woods, 2006; Klampf, Lobinger & Raab, 2013). Moreover, these conditions can produce levels of fear and anxiety so overwhelming that many athletes are forced into early retirement (Collins, Mporris & Trower, 1999). Despite acknowledgement that these symptoms appear to affect countless different sports skills, they have commonly been studied under disparate classifications with various descriptions. For example, movement disruptions are referred to as the *yips* in golf

¹ On completion of this programme of research the primary author was contacted by Scott Boswell who was interested in this PhD. This quote is taken from this meeting which was purely due to interest and knowledge share for both parties.

and cricket (McDaniel, Cummings & Shain, 1989), *lost move syndrome* (LMS) in acrobatic sports (Day et al., 2006), *target panic* in archery (Thomas, 2008), and *dartitis* in darts (Rotheram, Thomas, Bawden & Maynard, 2007). Likewise, Baseball pitchers are thought to suffer from ‘the dreaded Steve Blass disease’, dubbed after former major league pitcher Steve Blass of the Pittsburgh Pirates, who suddenly and inexplicably lost the ability to throw anything even close to a clean strike. In 1973, Blass walked 84 batters in 88 innings, and the following year 93 batters in 56 innings with several of his pitches missing the strike zone by a significant distance (Hooke, 2005). In 1975, the problem worsened and ultimately resulted in retirement after Blass walked a total of eight batters in just one inning (Weiss & Reber, 2012).

In all of these cases, affected-athletes appear somewhat curiously, to have lost the ability to perform previously mastered skills, yet remain physically capable of completing the same skills/parts of the same skills in different contexts. Thus, when a professional golfer has difficulty finishing a 2ft putt, or a platform diver cannot exit a tuck position, it is clearly more than a mechanical difficulty. Whilst the majority of sport specific cases have come from anecdotal observations and media reports, there has been a substantial amount of research investigating the yips in golf and cricket, and LMS in artistic sports. Despite increased interest, an accurate classification and description of the underlying components of these two disorders is still required. This must be addressed if exact diagnostic tools are to be developed that might be applied to similar problems across sport, therefore allowing for evidence based diagnoses and the development of appropriate interventions.

1.1 Purpose of this Thesis

This thesis was designed to delineate the yips and LMS; the two most formerly recognised performance disorders characterised by sudden and involuntary skill disruption through loss of movement control. This is of paramount importance if the disorders are to be effectively treated so that skill execution can be regained, and associated symptoms alleviated. Three studies were designed to demonstrate a progression from theory to practice, and more specifically identify and explore: 1) the psychological components underlying the lived experience of the yips and LMS; 2) the personality characteristics of yips/LMS-affected individuals to identify potential vulnerability factors; and, 3) the development of an intervention programme targeted towards the treatment of these problems.

1.2 Structure of this Thesis

This thesis comprises six chapters within which the three central areas of research are addressed. The specific structure of the thesis is as follows:

Chapter two provides a critical overview of the development of research pertaining to performance breakdown in the context of conventional psychology, and more extensively competitive sport. This chapter concludes with the identification of three main areas warranting further research, and thus provides the rationale underpinning studies one and two.

Chapter three (study one) explores the psychological symptoms, similarities, and implications for treatment of the yips and LMS. The purpose of this study was to explore the underlying components pertaining to the lived experience of the yips and LMS, and therefore ascertain whether they can be considered psychological problems classified as similar disorders irrespective of sport.

Chapter four (study two) explores levels of perfectionism, rumination, and reinvestment among yips and LMS affected individuals. The purpose of this study was to explore whether certain characteristics make individuals more susceptible to these afflictions. A secondary aim was to establish subjective stress responses to the experience of the yips and LMS.

Chapter five begins with a supplementary review of literature introducing the rationale for the final stage of research. This is followed by study three, which examines the effectiveness of an intervention developed to treat the yips and LMS with two separate studies. Specifically, study three identifies the effectiveness of an intervention adopting *eye movement desensitisation and reprocessing* (EMDR; Shapiro, 2001), alongside graded exposure, to treat a yips-affected golfer and an LMS-affected platform diver.

Chapter six summarises the findings of the research programme and discusses the theoretical and practical applications emanating from the three studies. This chapter also identifies the strengths and limitations of this thesis, and highlights suggestions for future research.

2.0 Review of Literature

2.1 Introduction

Athletic performance of the highest level is arguably one of the most challenging of human accomplishments. Exceptionally skilled, pre-defined movement patterns are ingrained in memory and accessed with extreme reliability, often under incredible levels of pressure, anxiety, and expectation. To acquire these skills athletes must commit to extensive training over many years, gradually increasing the physical and tactical complexities of each movement. The loss of movement control is therefore not only traumatic but frequently career destroying. There is an ever-increasing amount of research in the field of sport psychology examining incidences in which highly skilled athletes suffer the long-term loss of a skill that they once executed automatically (Collins, Morris & Trower, 1999).

Traditionally explored under numerous guises dependant on sport, the two most recognised and widely researched of these problems are the yips in sports such as golf and cricket (Klampf, Lobinger & Raab, 2013; Smith et al., 2003), and *lost move syndrome* (LMS) in acrobatic sports such as gymnastics, trampolining, and diving (Day et al., 2006). Physical manifestation of these problems commonly involves involuntary shaking, spasms, jerking, and or locking of the muscles required for movement control (McDaniel, Cummings & Shain, 1989; Stinear et al., 2006). Psychological symptoms are thought to include anxiety, fear, hyper-vigilance, avoidant behaviour, and persistent rumination (Day et al., 2006; Rotheram, Maynard, Thomas, Bawden & Francis, 2012). It would seem that these problems initially become apparent when fear is heightened in response to threatening stimuli (e.g., Sachdev, 1992; Stokes, 2009), and that after an initial unexpected episode the

problems gradually escalate, in some cases transferring to other contexts (Philippen & Lobinger, 2012; Rotheram et al., 2007).

To ensure clarity of the research paradigm, a clear operational definition is required that has collective agreement, and explicitly represents the underlying components of these disorders (Philippen, 2013). Therefore, the first part of this review will provide a thorough exploration of research to date, outlining existing theoretical assumptions associated with these problems. This will lead to further consideration of the most evident psychological components and the processes by which they interact.

2.2 Performance Breakdown in Sport: The yips

2.2.1 Definition.

The yips manifest in the guise of involuntary muscle contractions that disrupt the performance of refined motor skills (e.g., the putting stroke in golf, or the bowling action in cricket) (McDaniel, Cummings & Shain, 1989). It is unclear, however, exactly when the yips was first recognised as a problem. Foster published a medical report on “the putting agony” in 1977, and there has been a growing body of literature investigating the condition ever since. According to various case reports, athletes initially experience the problem sporadically after a history of playing at a high level, and without difficulty. Once affected, players will generally suffer the affliction for the rest of their career, as former professional golfer Tommy Armour declared: “once you’ve had ‘em you’ve got ‘em” (Rotheram, 2007). It is believed that the yips often go unrecognised or are misdiagnosed (Dhungana & Jankovic, 2013), and as such overall prevalence rates are yet to be established. Indeed, large proportions of case reports have been derived from media commentaries of major sporting events, and are

therefore potentially naive observations. For example several famous cases have been publicised in the media during the last two decades, perhaps the most highly publicised of which was cricketer Scott Boswell's experience of the yips during the 2001 C&G final that has since received nearly two million views on YouTube as "the worst over ever", an episode that not only ended his career but led to a painful 10 year recovery period.

Possibly the earliest explanation exclusively for the yips was put forward by Wertz (1986) who suggested that the yips occur when subconscious and conscious processes are out of sync, resulting in the body performing actions without the mind being aware of the movements. This theory fits with the notion that movements of optimal efficiency are processed off-line, and therefore initiated at a subconscious level of awareness (Marquardt, 2009). Indeed, McDaniel et al. (1989) described the yips in golf-putting as a neurological phenomenon consisting of involuntary movements occurring with the execution of finely controlled, skilled motor behaviour. In their study, McDaniel et al. (1989) proposed that the yips were a unique type of neuromuscular movement disorder or dystonia, similar to focal dystonia, or writers' cramp (Sheehy & Marsden, 1982) and characterised by involuntary movements in the form of spasms, twisting, unwanted body positions, and intense anxiety directly impacting skill execution (Pont-Sunyer, Marti & Tolosa, 2010). In later studies, Smith and colleagues (2003) provided a qualitative analysis of 72 yips-affected golfers' subjective descriptions of the yips. They reported that 55.6% of participants experienced dystonic like symptoms; 22.2% described symptoms comparable to extreme choking, 19.4% reported both, and the remaining 2.8% provided 'non interpretable responses' (Smith et al., 2003). Based on these findings, Smith and colleagues (2003) suggested that dystonia and choking represent two poles of a

continuum, along which two types of yips could be differentiated: type I, and type II. Essentially, type I yips represented a form of *focal dystonia* characterised by difficulties with muscle tension, and/or the loss of movement control; whereas type II yips lay at the opposite end of the continuum as a form of choking, with individuals reporting difficulties relating to stress, and/or anxiety. Stinear et al. (2006) demonstrated similar findings, highlighting dystonia and anxiety as underlying mechanisms of two types of yips. Using the above criteria, they compared groups of type I (dystonia), and type II (choking) yips-affected golfers, and found higher levels of disrupted movement in the type I yips group, and higher levels of anxiety in the type II yips group.

It could be argued that the yips involve several characteristics pertaining to both dystonic and extreme choking conditions, however, it seems questionable whether a continuum from neurological (dystonia), to psychological (choking) origin truly describes one and the same problem. This could in part be due to the inclusion criteria adopted for participants in these studies, and subsequently the 22.2% of participants reporting symptoms of choking might indeed have been experiencing choking, rather than the yips, or any other more severe condition. Furthermore, research specifically investigating the yips has identified symptoms of choking as consequences of the yips experience, rather than causal factors, or aspects that define the lived experience (Rotheram et al., 2007).

2.2.1.1 Choking.

By its earliest definition, choking refers to inferior performance in pressure situations while striving for optimal success (Baumeister, 1984). According to Baumeister's (1984) model of choking the yips would equate to a dramatic decline in an athlete's ability as a direct result of attentional disturbance, caused by distraction or

excessive self-focus, and coupled with deliberate attempts to control movement (Beilock & Gray, 2007; Mesagno & Hill, 2013). In sport, this definition, and countless similar ones have been used with varying levels of reservation, one main criticism being whether choking should be reserved for distinct and acute performance failure, as opposed to general under-performance (Hill, Hanton, Fleming & Matthews, 2009). Thus, researchers have attempted to expand Baumeister's (1984) definition, suggesting that choking occurs when "heightened levels of perceived pressure lead to acute, or chronic forms of suboptimal performance, or performing more poorly than expected given one's skill level and self-set performance expectations" (Gucciardi, Longbottom, Jackson & Dimmock, 2010, p.79). Mesagno and Hill (2013) extended this and proposed the most recent operational definition as "an acute and considerable decrease in skill execution and performance when self-expected standards are normally achievable, which is the result of increased anxiety under perceived pressure" (p 9).

Although these definitions are important, and recognise the impact of pressure and anxiety, they still equate choking to *suboptimal* performance, rather than momentarily impossible, or otherwise more extreme movement disruption (i.e., the yips/LMS). In an attempt to provide conceptual clarity to this debate, Hill, Hanton, Matthews, and Flemming (2011) conducted qualitative research to explore the cognitions, emotions, and consequences associated with choking compared to general under-performance. They reported several distinguishing factors: the magnitude of the experience, negative cognitive appraisal of anxiety, a lack of perceived control, and self-presentational concerns. Additional psychological consequences included diminished enjoyment, lowered well-being, and impaired self-identity, however the return to performance post-choke is not entirely understood (Hill et al., 2011).

Whilst there are clearly similarities between the yips/LMS, and choking; (e.g., heightened levels of anxiety, impaired ability to execute a skill, loss of control, and pressure), there are still some substantial differences including the intensity of anxiety, the severity and pattern of movement disruption, and the escalating longevity of the condition. As such, Clark, Tofler, and Lardon (2005) attempted to further delineate choking under pressure to provide a clear distinction between choking and the yips. They highlighted that while experiencing a choke, the athlete is still able to make rational decisions, and appropriately select actions under pressure. Consequently, they concluded that the yips were more likely to be a form of focal dystonia, as the affected individual experienced involuntary muscle contractions, unintentional movements, and ultimately a momentary loss of cognitive and/or motor control. Thus, Clark and colleagues (2005) determined that whilst the choking literature might offer information that can assist with our understanding of the yips, it does not wholly define the problem. Indeed, it might be more appropriate to consider the yips as a form of dystonia, and assume that ‘type II yips’ (as defined by Smith et al., 2000) quantifies choking, rather than a unique form of the yips per se.

2.2.1.2 Dystonia.

Characterised by intermittent muscle contractions and abnormal/ involuntary movements in the form of twisting, repetitive spasms, or postures, in muscles required for skill execution (Fahn, 1988; Pont-Sunyer, Marti & Tolosa, 2010), dystonia arguably provides a perfect clinical analogy for the yips. Historically, dystonia has been considered a specific type of neuromuscular movement disorder affecting the planning and execution of voluntary movement (Avanzino & Fiorio, 2014). More recent research suggests that sensory aspects involving proprioception also play a substantial role (i.e., processes by which sensory information is used to plan and

execute volitional movements) (Patel, Jnakovic & Hallett, 2014). Specifically, it is thought that a dysfunction of the basal ganglia, and/or connections to the motor cortex play a major role in the pathogenesis of dystonia, by influencing the final organisation and execution of movement (Berardelli et al., 1998). Tasks most commonly affected by this disorder include writing and playing a musical instrument, although reports have also been made in other occupations requiring highly repetitive fine motor skills (e.g., painting/typing; Torres-Russotto & PeriMutter, 2008). In addition to research exploring the yips, references to dystonic-like symptoms have been made in sports such as darts (White, 1993), table tennis, shooting (Sitburana & Ondo, 2008), and tennis (Mayer, Topka, Boose, Horstmann & Dickhuth, 1999). All of these professions also demand repetitive fine motor movements, with experts investing in thousands of practice hours to perfect their skills. Notably, in all cases it is the skilled act that is dysfunctional, not the muscles required to execute the act.

Varying forms of dystonia have been identified, for example *dynamic stereotype*, *focal dystonia* (also known as *musicians dystonia*, or *writers hand cramp*), and *psychogenic dystonia*. Dynamic stereotype is thought to be a milder form of dystonia, and a consequence of long-term choking when dysfunctional movement patterns become learned behaviours (cf., Altenmuller, Ioannou & Lee, 2015). In contrast to other dystonia's, dynamic stereotype is also believed to fluctuate during stressful performances, and respond to sensory tricks. Focal dystonia is considered to be a more severe form of movement disorder, characterised by persistent loss of movement control in the muscles required for finely tuned skills (Altenmuller, 2003). Similarly to performance breakdown in sport, various observable symptoms are involved in the manifestation of the disorder, including loss of deliberate control, and involuntary flexion, tremors, or spasms in the required muscles. Psychogenic dystonia

is a more severe form of the disorder, previously associated with conversion disorders caused by unresolved psychological conflict, and subconscious interference of behaviour. Generally speaking, it is assumed that individuals affected by this form of dystonia also report a history of traumatic life-experiences (physical, emotional, and/psychological), and appear emotionally distant. Specific triggers can often be identified however there are yet to be any successful treatment methods developed (Thomas, Vuong & Jankovic, 2006). Interestingly, both focal and psychogenic dystonia's are thought to spread to other context specific (daily-life) movements, and have also been associated with psychological disorders such as anxiety and obsessive-compulsive disorder (cf., Altenmuller, Ioannou & Lee, 2015), again not dissimilar to factors linked with performance breakdown in sport.

The strongest evidence presented for the yips as a form of dystonia, comes from Adler and colleagues (2005). These authors used electromyography EMG data to confirm jerking or twisting movements in yips-affected golfers compared to non-suffering counterparts, and co-contraction of wrist extensors and flexors in 50% of those. Co-contraction of agonist and antagonist muscles is a characteristic feature of dystonia (Lee, Chadde, Altenmuller & Schoonderwaldt, 2014), and it was therefore suggested that the yips were a specific type of focal-dystonia affecting the hand and arm. In a follow-up study, Adler et al. (2005) maintained these findings, reiterating that the yips might be a task specific form of focal dystonia in at least a subset of golfers. The most recent support for this theory comes from Dhungana and Jankovic (2013), who observed initial yip-like symptoms progressing to task-specific dystonias or tremors in a group of single treatment patients. Interestingly, research assessing various forms of dystonia (e.g., writer's cramp, musicians hand cramp), has also reported high levels of anxiety once the disorders surface, and that this might

exacerbate symptoms (Mesagno & Mullane-Grant, 2010). Marquardt (2009) made a similar point when exploring the vicious cycle of the yips, suggesting that anxiety serves to exacerbate symptoms following initial onset, thus preventing the affected individual from breaking the cycle.

2.2.2 Underlying components of the yips.

2.2.2.1 Anxiety.

In a recent report, Scaer (2014) described the yips as a form conversion disorder or neurosis, the basis of which is anxiety converted into physical symptoms (e.g., a jerk or a spasm). Essentially, Scaer (2014) proposed that experiencing anxiety in a physical form (e.g., muscle tension, avoidance behaviour) is less painful than its raw emotional state. The importance of anxiety has been a consistently emerging theme in the yips literature. In McDaniel et al.'s (1989) first major study of 360 yips-affected golfers, anxiety reportedly intensified the individual's emotional response to the yips experience. Although these authors concluded that the yips were a form of physical rather than psychological problem, they highlighted the prominence of anxiety and obsessional thinking in the manifestation of the yips. In another study, Bawden and Maynard (2001) highlighted intense anxiety associated with the personal experience of yips-affected cricket bowlers. Other psychological characteristics identified were cognitive anxiety, ineffective focus, feeling trapped, increased self-consciousness, and conscious control of movement. Philippen and Lobinger (2012) reinforced these findings when they explored the thoughts, feelings, and focus of attention of yips-affected golfers. Their study comprised of semi-structured interviews with a group of 17 yips-affected golfers, to establish an understanding of the personal experience of the yips (Philippen & Lobinger, 2012). Again, their findings confirmed

that yips are associated with feelings of frustration, disappointment, anger, anxiety, and a perceived loss of control.

The notion of anxiety as the only cause of the yips was challenged in 1992, in a study assessing 20 yips-affected and 20 non-yips affected golfers. Sachdev (1992) explored the clinical characteristics of 20 golfers suffering from the yips, with the aim of concluding whether the yips were a psychological or physical problem. Participants in this study were required to complete a number of self-report measures to establish their psychopathology. Measures included: The General Health Questionnaire (GHQ; Goldberg & Williams, 1988); Spielberger's Trait Anxiety Scale (STAI; Spielberger, Gorsuch & Lushene, 1970); Eysenck Personality Inventory (EPI; Eysenck, 1968); Leyton Obsessional Inventory (LOI; Cooper, 1970); Zung Self-Rating Depression Scale (Zung, 1965); the Somatization, Anxiety and Phobic Anxiety subscales of Symptom Check List-90 (SCL; Derogatis, 1994); Bortner Type A Behaviour Scale (Bortner, 1969); and Childhood Separation Anxiety Scale (SAS; Spence, 1997). Participants were also required to rate themselves on an anxiousness scale, and a number of neuropsychological tests were carried out to establish visual coordination, and mental/motor speed. Interestingly, no significant differences were reported for the self-report measures between those with the yips and the control group. Whilst Sachdev (1992) concluded that the golfers yips were not a form of neurosis per se, it was accepted that anxiety, among other psychogenic components (e.g., panic, fear, rumination) undoubtedly plays an important part in the manifestation and longevity of the disorder. Based on the review of research thus far, it might be that anxiety is not only causal, but also a significant component in the maintenance of these disorders. The above research clearly highlights a consistent level of emotional content with the yips, primarily in the form of anxiety. While this does not justify classification of the

yips as an anxiety disorder per se, it certainly provides direction for future research. Interestingly persistent anxiety has been linked to the experience of significant life-events and trauma, the memories of which are stored in an unprocessed form, resurfacing in the event of stimuli either familiar to the original event, or in some other way threatening (American Psychological Association; APA, 2013; Lees, 2002; Schweinfurth, Billante & Courey, 2002; Thomas, Vuong & Jankovic, 2006). Indeed, it is advised that individuals exposed to repeated traumas, and prolonged stress, are susceptible to a variety of psychological conditions years after the event (Christianson & Marren, 2008; Forbes et al., 2007).

2.2.2.2 Significant life-events.

The experience of significant life-events has been associated with the development of the yips (e.g., Roberts, Rotheram, Maynard, Thomas & Woodman, 2013; Rotheram et al., 2007). Bawden and Maynard (2001) found that psychologically significant sport-related events (e.g., dropped catch, embarrassment, arguments) were reported prior to cricket bowlers first yips experience. Rotheram and colleagues (2007) also proposed that psychologically significant life-events experienced away from the sporting context (e.g. death of a loved one, relationship breakdown), might be a factor in the onset of yips symptoms such as physical freezing and fear. In their study, Rotheram et al. (2007) conducted qualitative interviews with 12 individuals experiencing the yips (identified by self-report as a dramatic long-term loss in ability to perform a specific skill over a two-year period). All participants in this study reported a chain of significant life-events taking place prior to their yips experience, including humiliation, shame, relationship breakdown, and death of a loved one, to more serious reports of abuse, trauma, and injury. On concluding their study Rotheram and colleagues (2007) advised that their findings be received with

caution due to sampling criteria, and ‘tentative’ links between the significant event and development of the yips. However, initial evidence would certainly support the possibility that various psychological characteristics associated with the lived experience of the yips (e.g., intense fear, panic, and anxiety), as well as reported coping mechanisms (e.g., avoidance behaviour, dissociation) are connected to significant life-events.

The experience of physical, emotional, and/or psychological trauma throughout life has also been linked to severe forms of dystonia (Altenmuller, Ioannou & Lee, 2015). In a study of trauma victims, Christianson and Marren (2008) also reported symptoms such as re-experiencing, emotional numbing, behavioural avoidance, and increased physiological arousal amongst sufferers. While research is yet to clarify the role of trauma experience in the development of psychological disorders, theory suggests that when an individual experiences an overwhelming emotional event, the brain’s capacity to process that event rationally is flooded, causing the memory to be stored in its raw, unprocessed form (Shapiro, 2001; Stokes, 2009). In some cases the raw emotional content is then converted into physical symptoms to prevent harmful re-experiencing of the psychological aspects (Baker & Humblestone, 2005). Specifically, it is thought that environmental stimuli perceived as dangerous or threatening can cause traumatic memories to resurface as physical symptoms (e.g., in the form of a yip), coupled with feelings of fear, anxiety, and panic associated with the initial memory, while the content of the memory itself remains blocked (Brown, 2004).

Thus far, links have been made between the various components of the yips (including anxiety, loss of control, and sudden movement breakdown), disorders in clinical psychology characterised by similar symptoms, and the potential impact of

significant life-events. It is clear that the psychological condition of the individual, retrieval of motor programmes, and capacity for motor control, all play a role in sudden performance breakdown. Indeed, not every individual will respond to equivalent experiences in the same fashion; while some trauma victims suffer from anxiety-based disorders, others make a full recovery (APA, 2013). Similarly, not every sports person will experience the yips. In an attempt to address this, researchers have begun to investigate individual differences in relation to one or many of the components associated with the yips.

2.2.2.3 Personality characteristics.

The first link between personality characteristics and the yips was presented by McDaniel et al. (1989), who suggested that individuals affected by the yips were prone to obsessional thinking habits. Since this study, several other characteristics have been linked to the yips experience, including rumination, reinvestment, and perfectionism (e.g., Roberts et al., 2013; Rotheram et al., 2007). It has been suggested that perfectionism is a consistent predictor of anxiety across a range of populations (Frost & Henderson, 1991; Hall, Kerr & Matthews, 1998; Taylor, 2014), and has shown to be elevated across 13 different anxiety-related disorders, including *post-traumatic stress disorder* (PTSD), *obsessive-compulsive disorder* (OCD), *panic disorder*, and *depression* (Egan, Hattaway & Kane, 2013; Ehring, Frank & Ehlers, 2008). It has also been reported that individuals with perfectionistic tendencies experience higher levels of anxiety following a setback or mistake (Sachdev, 1992). Consequently, perfectionism has received widespread attention throughout both sport and non-sport psychology literature (e.g., Flett & Hewitt, 2008; Frost & DiBartolo, 2002; Stoeber & Otto, 2006).

Several conceptualisations of perfectionism have been proposed, although to date, Frost and colleague's (1990) model remains one of the most widely accepted (e.g., Koivula, Hassmen & Fallby, 2002; Philippen & Lobinger, 2012; Roberts et al., 2013). The *Frost multidimensional perfectionism scale* (FMPS; Frost et al., 1990) proposes that perfectionism consists of six major components: *personal standards, organisation, concern over mistakes, doubts about actions, parental expectations, and parental criticism*. Since its introduction, two broad dimensions have been recommended to incorporate the respective subcomponents: *perfectionistic striving* (i.e., striving for perfection, personal standards, organisation), and *perfectionistic concern* (i.e., concern over mistakes, doubts about actions, parental expectations, and parental criticism). Stoeber and Otto (2006) extended this by distinguishing between healthy and unhealthy profiles of perfectionism, the latter involving high-levels of both perfectionistic striving and perfectionistic concern, consequently increasing vulnerability to contextual difficulties and performance breakdown. Specifically, high correlations have been found between perfectionistic striving and perfectionistic concern, leading to negative behavioural outcomes (e.g., neuroticism, maladaptive coping, negative affect), and psychological maladjustment (e.g., depression) (cf. Stoeber & Otto, 2006). Thus, it is not surprising that perfectionism has been considered within a traditional diathesis-stress model (Zuckermann, 1999), and viewed as a vulnerability factor for numerous psychopathologies (O'Connor & O'Connor, 2003).

Egan, Wade and Shafran (2011) reviewed the role of perfectionism across a number of psychological issues (e.g., anxiety disorders, depression, and eating disorders), and supported the notion that perfectionism does indeed appear to embody both cognitive and behavioral characteristics that increase vulnerability to a number

of psychological disorders (e.g., obsessive actions, extreme vigilance, and body control behavior; Yang & Stoeber, 2012). Although it appears that perfectionism might have both positive and negative components (Stoeber, 2011), perfectionism coupled with self-criticism is often seen as maladaptive for sports performers, with negative self-defeating outcomes on behaviour (e.g., depression, body-image dissatisfaction, avoidance behaviour) reported among extreme perfectionists (Flett & Hewitt, 2008). Given the major factors associated with the yips (e.g., anxiety, intrusive negative thoughts, obsessive thinking), it is fair to assume that unhealthy perfectionism might be an antecedent, and also exacerbates response symptoms. Specifically, given the research available, it is feasible to assume that perfectionism might cause individuals to negatively appraise an experience of the yips, doubt their ability, and invest conscious effort to regain movement control. Thus, in turn disrupting the required level of automacity.

Flett, Hewitt, Blankstein and Gray (1998), suggested that psychological distress associated with perfectionistic thinking patterns was intensified by rumination. Rumination, or *post-emotional elaboration*, includes conscious thoughts, images, and/or memories revolving around the causes, symptoms, and consequences of a significant emotional experience that recur without intention (Nolen-Hoeksema, 2000). Rumination has traditionally been viewed as three-dimensional: *reflection*, *brooding*, and *depression*. It is thought that the brooding construct of rumination (i.e., passive judgement of one's current situation with an unachieved expectation), might maintain the relationship between perfectionism, psychological distress, and anxiety disorders (Egan, Hattaway & Kane, 2013). Michael, Halligan, Clark, and Ehlers (2007), suggested that ruminative brooding maintains anxiety symptoms due to focusing on "why" and "what if" questions, rather than processing the actual trauma

experience. Flett and Hewitt (2008) also suggested that perfectionists ruminate about failure, and that those scoring highly on the concern over mistakes aspect of the FMPS were more likely to participate in ruminative brooding.

Flett, Madorsky, Hewitt and Heisel (2002) investigated the extent to which perfectionism is associated with rumination and cognitive intrusion, in response to a particularly stressful experience. The authors administered the FMPS, the *ruminative response scale* (RRS; Nolen-Hoeksema, 1991), and the *impact of events scale* (IES; Zilberg, Weiss & Horowitz, 1982) to a sample of 65 psychology students. Results indicated that high-levels of perfectionism and rumination were associated with depression and anxiety following a traumatic experience. These findings support the notion that perfectionism and rumination contribute to psychological distress and anxiety following trauma. Given that anxiety, along with recurrent thoughts, images, and memories, are central components of the yips, it is reasonable to assume that levels of both perfectionism and rumination might also be increased among affected individuals. Existing qualitative investigations exploring the yips would appear to support this. For example, several studies have reported that individuals suffering from the yips invest considerable time and cognitive resource engaging in obsessive thinking about the experience, specifically focusing on the negative outcome and potential causes (Bawden & Maynard, 2001; Rotheram et al., 2007). More recently, Roberts et al. (2013) administered a shortened version of the FMPS in order to assess levels of maladaptive perfectionism, obsessional thought processes, and self-consciousness. A sample of 60 yips-affected athletes from golf, cricket, and darts revealed unhealthy perfectionistic profiles (i.e., high-levels of personal standards, concern over mistakes, and organisation), compared to a sport-matched control group.

Research has demonstrated that individuals affected by the yips obsess over the problem in a highly self-critical manner, investing conscious effort to overcome the disorder (Roberts et al., 2013). Masters (1992) referred to the conscious awareness of a problem and subsequent attempts to control movement as *reinvestment*, which he explained through the *conscious processing hypothesis*. Specifically, under increased anxiety performers will reinvest conscious effort to control movement execution, ultimately inhibiting automatic processing. While self-focus can be induced from a variety of stimuli, it is more commonly linked to anxiety (Gray, 2004), a major component of the yips. A substantial amount of research has reported the effects of self-focus and rumination in exacerbating anxiety-related disorders (Morrison & Heimberg, 2013). Research has also described links between *focal dystonia* and self-conscious reinvestment (Grattan et al., 2001). Given the major role anxiety appears to play in the yips, and the similarities between the yips, dystonic problems, and anxiety-related disorders, one might expect to see similar patterns of self-focussed reinvestment emerging with the yips. To assess the effect of reinvestment, Masters, Polman and Hammond (1993), developed the reinvestment scale, their hypothesis being that self-focussed awareness (initiated by various stimuli) promotes reinvestment, which, in turn, causes performance breakdown. Gray et al. (2004) adopted the scale to demonstrate that cricket batters increased conscious control, and therefore reinvestment, during a poor performance streak in an attempt to overcome the escalating problem. Reinvesting in an attempt to overcome the yips might only exacerbate symptoms. Hence, Roberts et al. (2013) proposed that self-consciousness was characteristic of the yips, and suggested that performance breakdowns caused yips-affected golfers to reinvest more conscious effort over performance, effectively causing repeated yips experiences.

2.2.3 Diagnosis.

Despite the growing amount of research looking at the yips, there still appears to be a lack of consensus as to whether the yips are a psychological or physical problem. Thus, psychologists have understandably faced major difficulties appropriately diagnosing the disorder, traditionally adopting criterion based on self-report, and/observation of physical movement disruption to the lower arm in the form of twisting, muscle tension, or spasms causing loss of ability to execute the skill (e.g., Smith et al., 2000; 2003). In an attempt to overcome this problem and develop a more detailed diagnostic tool, researchers have adopted a range of psychometric (e.g., McDaniel et al., 1989; Roberts et al., 2013), electromyographic (e.g., Smith et al., 2000), behavioural (e.g., Stinear et al., 2006), performance (e.g., Bawden & Maynard, 2001; Smith et al., 2000), and kinematic tools (Marquardt, 2009). For example in a recent study, Klampf, Lobinger and Raab (2013) combined psychometric, psychophysiological, behavioural, and kinematic measures to assess yips-affected golfers. Interestingly, findings from this study were inconsistent with previous research, arguing that the yips are a physical movement problem and not related to focal dystonia. These authors also reported nonsignificant levels of anxiety, perfectionism, movement/decision reinvestment, and stress coping, all of which have been repeatedly demonstrated in previous studies (McDaniel et al., 1989; Rotheram et al., 2007). Following this study it was argued that the yips might be caused by motor-related mechanisms and the transference of a learned behaviour from a similar sport (Klampf, Lobinger & Raab, 2013). In another study, Lobinger, Klampf, and Altenmuller (2014) also attempted to combine a variety of assessment methods in a 3-step criteria: 1) explorative (history taking, biography, and individual perception); 2) physical examination (changing context, equipment, and task); and 3) broader

assessment using psychometrics and ultrasound equipment (e.g., personality inventories and SAM motion analysis data). Again however, the inclusion criteria used in these studies was based on self-report, and/observation of physical movement disruption in the form of observable twists in the wrist used for putter control. With such lack of clarity concerning the underlying components and mechanisms involved in the yips, it is not surprising that diagnosis has thus far relied on observation of the physical symptoms alone. Based on the literature reviewed thus far though, it seems clear that a more complete framework is required that recognises the many psychological components involved.

2.2.4 Treatment methods.

Perhaps due to the existing level of confusion surrounding diagnosis of the yips, it is no surprise that successful treatment methods are also lacking. With the exception of one more recent study (Rotheram et al., 2012), the majority of methods adopted thus far have focused on treating the physical symptoms using cognitive behavioural methods or technical modifications. For example several researchers attempted to alleviate physical symptoms of the yips in golf-putting, by making technical changes to the skill, and/using various trick strategies (e.g., putting one handed, altering the club face, putting from table height; e.g., Klampfl, Philippen & Lobinger, 2015). However, these methods have failed to treat the problem, alleviating behavioural symptoms only, and in laboratory conditions (e.g., Lobinger, Klampfl & Attenmuller, 2014). Using a single-subject case study, Ringman (2007) demonstrated reduction of yips symptoms using an *N*-methyl-D-aspartate receptor antagonist (memantine) primarily used for the treatment of Alzheimer's disease. Whilst further evidence is recommended to confirm these findings, this study suggests that treating

psychological processes alleviates yips symptoms, and therefore that the processes involved in the yips might indeed be psychological.

In another study, Bell, Skinner, and Fisher (2009) investigated the use of guided imagery for the yips in golf. Although they reported successful short-term use of this method, longitudinal follow-up data were not provided. Furthermore, this study again consisted of a single-subject research design, and findings therefore cannot be generalised. Rotheram and colleagues (2012) also conducted a single-subject case study to establish whether the meridian based intervention *emotional freedom technique* (EFT), could effectively reduce yips symptoms (cf. Rotheram et al., 2012). This research was driven by the theory that yips are a psychogenic problem in the form of trauma disguised as physical symptoms, and that significant life-events were also involved. These authors proposed that identifying, and addressing the memories associated with these events would reduce the symptoms of the yips. While results from this study demonstrated that EFT was an effective method for alleviating yips symptoms, the findings must be interpreted with caution due to the single-subject design and lack of additional research evidence supporting this treatment method, particularly in sport. However, these results add valuable knowledge towards the treatment of yips, and also demonstrate the involvement of significant life-events in the onset and development of the yips.

2.3 Performance Breakdown in Sport: Lost Move Syndrome

To date, research exclusively examining LMS has been limited to only three published studies (Collins, Morris & Trower, 1999; Day et al., 2006; Silva, 1994), and two published magazine articles (Tenn, 1995a; 1995b), with much of this evidence remaining inconclusive and anecdotal. LMS is associated with acrobatic sports such as diving and trampolining, and has been described as a condition in which an athlete

loses awareness of body position, and the ability to execute a particular technique or skill (Day et al., 2006). In an article on LMS in trampolining, Tenn (1995a) proposed various psychological causes of LMS, including increased stress, anxiety, low self-esteem, and lack of motivation. In contrast, Collins and colleagues (1999) suggested that deliberate overthinking of the skill caused LMS, while others have likened it to a phobia, manifesting in the form of fear, anxiety, and loss of conscious control (Silva, 1994). Interestingly, Silva (1994) recommended that LMS-affected athletes remain in possession of the motor programme for the skill, and are still physically capable of performing it, but are somehow subconsciously prevented. Indeed, it has been established that well-learned movements are stored and processed subconsciously (Masters & Maxwell, 2004), meaning that movements of optimal efficiency are largely performed at an automatic level of control (McFarlane & Yehuda, 2000). The proficiency of this movement organization requires various sources of information to be accessed (e.g., balance, coordination, rhythm, special awareness), and therefore any inappropriate emotional, cognitive, or behavioral input will only serve to interfere with the process (Carson & Collins, 2011). It would be feasible then to assume that if affected individuals still have the mechanical capability, performance breakdown might occur when an individual is unable to access the required motor programme.

The most comprehensive study of LMS explored the psychological causes and consequences of LMS in trampolining (Day et al., 2006). Day and colleagues (2006) conducted semi-structured interviews with 15 trampolinists. Findings from this study revealed that the training environment could potentially trigger an initial occurrence of LMS, and that accelerated skill acquisition increased susceptibility. Specifically, these authors suggested that LMS might be traced back to inadequate skill acquisition, which when coupled with increased pressure from various sources, led to a series of

negative emotional reactions and skill breakdown. As such, they proposed that LMS was the result of a switch from automatic to conscious processing, and deliberate control over an automatic movement pattern. Results from this study also reported crying, worsening depression, and feelings of stupidity as psychological responses to LMS, as well as a gradual increase in fear of performing the affected move, elevated levels of cognitive, and/or somatic anxiety, and engagement in various avoidance strategies. Finally, Day et al. (2006) highlighted that while LMS became apparent only when individuals observed movement disruption, they considered the emotions they experienced prior to this (e.g., fear) to be closely related.

No prevalence rates have been reported for LMS, and despite several attempts, there are yet to be any successful treatment methods developed (Day et al., 2006). From a coaching perspective, Tenn (1995b) proposed that LMS could be treated by re-learning fundamental components of the affected skill, essentially breaking each stage of the skill chain down, and practicing constituent parts before progressively linking them back together. Other research studies have suggested similar techniques aimed at re-learning core components of the skill chain independently (e.g., Day et al., 2006). However, despite numerous efforts, attempts at technical changes to the skill have provided only short-term symptom relief, and not a conclusive cure (Day et al., 2006).

2.4 Future Research Directions

There is evidently still a great deal of understanding to be gained regarding the sudden breakdown of automatic skills in sport. With the growing awareness of performance breakdown, and existing confusion over the underlying components of these problems, their appropriate classification is problematic. Furthermore, due to current inconsistencies in effective treatment methods, more appropriate interventions

need to be developed. As such, there are several lines of enquiry that warrant research attention:

2.4.1 Identification of the underlying psychological components.

The preceding review highlights several components associated with both the yips and LMS. Furthermore, despite various studies reporting psychological symptoms, the nature in which psychological processes are involved in the lived experience of both these problems has not been deliberately explored. Consequently, we are no further forwards in developing successful treatment methods. Research in this area is typically characterised by the assessment of observable physical symptoms of these disorders, consequently yet inadvertently alluding to additional psychological factors. Furthermore, research has so far viewed the yips and LMS as distinctly separate problems. However, based on the symptoms reported in the preceding review of literature, it appears possible that they are forms of the same condition in different contexts. Understanding the architecture of these conditions is essential if effective treatment methods that target the individual experience are to be developed. This requires examination of the psychological components involved in the lived experience of these performance problems across sport.

2.4.2 Establishing individual susceptibility.

Roberts and colleagues (2013) associated perfectionism, reinvestment, and obsessive tendencies with the yips, adding to previous research reporting perfectionistic traits among yips sufferers' (e.g., Rotheram et al., 2007). Furthermore, these characteristics have also been linked to anxiety-related disorders and dystonia that have parallels with both the yips and LMS. However, with only a handful of studies addressing personality characteristics of yips-affected individuals, and to our

knowledge none amongst LMS-suffers, it is not possible to infer how these factors might interrelate to the underlying psychological components. The significance of investigating personality characteristics has both theoretical and practical implications. From a theoretical perspective, these characteristics are critical for understanding the course of events following an initial performance breakdown. For example the appraisal of an initial performance breakdown made in the immediate aftermath, followed by the self-perpetuating nature by which the condition manifests, escalates, and is maintained. From a practical perspective, if one or more profiles are found to increase susceptibility to performance breakdown, then individuals might be targeted by preventative treatments. Following a thorough review of the literature, it also appears that the yips might be associated with a history of significant life-events and trauma experience (Rotheram et al., 2012). The extent to which a given experience can be considered significant, or traumatic is predominantly dependent on individual perception, appraisal, and recovery following the event. Thus, identifying individual characteristics that are heightened among individuals affected by these conditions, will allow for interventions to be developed targeting those perhaps more vulnerable to performance breakdown.

2.4.3 Development of effective treatment methods.

Despite several attempts at treating these conditions, research is yet to develop an effective treatment method for performance breakdown in sport, primarily due to the lack of understanding regarding the underlying processes and mechanisms involved. Understanding the underlying components of performance breakdown will allow for qualitative approaches, single-subject designs, and case study methods to assess performance breakdown in an applied setting and test the effectiveness of more appropriate interventions.

2.5 Summary of the Literature Review

This review of literature has attempted to provide a critical overview of the research pertaining to two forms of performance breakdown in sport: the yips and LMS. The review has directed the reader through numerous physical, psychological, and behavioural components related to these problems, through which several similarities and major themes have emerged. Both the yips and LMS appear to involve the sudden, inexplicable loss of ability to execute a specific skill that could previously be performed without concern. Individuals suffering from the yips/LMS have reported intense somatic, and/cognitive anxiety, fear associated with the skill and/context, embarrassment, confusion, and frustration. Additional behavioural consequences of both include avoidance of the skill, and/environment, disturbed sleep, obsessive negative thinking, and in more serious cases bouts of depression.

Despite numerous similarities between these two problems, they have so far been studied as entirely separate entities according to sport. There also remains a lack of consensus regarding their classification as psychological or physical problems, despite increasing reports of psychological components. Individuals suffering from the yips/LMS are thought to remain in possession of the required motor programme, and still be physically capable of the movement, further inferring that these problems might not have entirely physical foundations. Unsurprisingly, treatment methods have been largely unsuccessful, focusing almost exclusively on the physical elements using cognitive methods, and/making technical changes to the affected skill. Thus, the general aim of this thesis was to examine the underlying components involved in the yips and LMS, and to provide a more appropriate classification in the hope that effective treatment methods might be developed.

CHAPTER III

3.0 Study One

Yips and Lost Move Syndrome: Exploring Psychological Symptoms, Similarities, and Implications for Treatment²

3.1 Introduction

There has been increasing reference in sport psychology literature to performance problems characterised by involuntary muscle tension, spasms, shaking, and/locking of limbs, culminating in the loss of a previously automatic skill (McDaniel, Cummings & Shain, 1989; Philippen & Lobinger, 2012). Thus far research has explored these problems independently, referred to as *the yips* in golf, and *lost move syndrome* (LMS) in diving, trampolining, and gymnastics. Despite evidence of both physical and psychological components (e.g., fear, hyper-vigilance, avoidant behaviour, persistent rumination; Bawden & Maynard, 2001; Day et al., 2006; Rotheram et al., 2012), both the yips and LMS have commonly been diagnosed, and treated according to their physical symptoms (Klampf, Lobinger & Raab, 2014).

As delineated by the previous review of literature, the yips have been referred to as a type of dystonia, similar to focal dystonia or writers' cramp (McDaniel et al., 1989; Sheehy & Marsden, 1982). Further research extended this idea to include two different forms of yips ranging from dystonia at one end of a continuum, to choking at the other (Smith et al., 2000; 2003). Whilst classification of the yips as a form of choking has since been disregarded, several studies have reinforced the notion of the yips as a unique form of dystonia (e.g., Bawden & Maynard, 2001; Rotheram et al., 2007). Psychological characteristics associated with the yips have included a range of emotional and cognitive factors, for example cognitive anxiety, ineffective focus,

² The study reported in this chapter has been published: Bennett, J., Hays, K., Lindsay, P., Olusoga, P., & Maynard, I.W. (2014). Yips and lost move syndrome: Exploring psychological symptoms, similarities, and implications for treatment. *International Journal of Sport Psychology*, 46, p61-82.

feeling trapped, increased self-consciousness, frustration, disappointment, anger, anxiety and conscious control of movement (Philippen and Lobinger, 2012).

More recently, psychologically significant life-events have been identified as a potential cause of the yips (Roberts et al., 2013; Rotheram et al., 2007). For example, it has been shown that histories of significant life-events (e.g. death of a loved one, relationship breakdown), as well as psychologically significant sport-related events (e.g., dropped catch, embarrassment, arguments), are experienced prior to the initial onset of the yips (Bawden & Maynard, 2001; Rotheram et al., 2007). As the previous review highlighted, this has been extended to include LMS, where it has been recommended that significant experiences in sport (e.g., injury, failure, vicarious experience) triggered comparable behavioural responses to those of trauma victims (e.g., anxiety, fear, panic, avoidance; e.g., Day et al., 2006).

Interestingly, it is also thought that the occurrence of psychologically significant experiences is associated with the development of various forms of focal dystonia, linked to dissociation and conversion (Lees, 2002; Thomas, Vuong & Jankovic, 2006). Specifically, research suggests that memories of significant events are inappropriately stored, and that psychological pain attached to them is converted into physical symptoms to prevent harmful re-experiencing of the event, should the memory resurface (Baker & Humblestone, 2005). Essentially, it is plausible that present day environmental stimuli can cause memory recall and consequently trigger physical symptoms (Brown, 2004). Thus, it is also possible that psychological characteristics associated with the yips (e.g., intense fear, panic, anxiety), as well as reported coping mechanisms (e.g., avoidance behaviour, dissociation), are linked to previous significant/traumatic experiences.

Various studies have looked to provide generic diagnostic criteria for yips-affected golfers (e.g., Klämpfl, Lobinger & Raab, 2013; Philippen & Lobinger, 2012). However, these studies have lacked consistency, adopting a variety of physiological, kinematic, and psychometric measures. For example, where classification of the yips as a form of dystonia has not been supported, it is likely due to inconsistent use of sampling criteria, the inclusion of varying yips aetiologies, and finally, the use of insensitive psychometric measures across studies (Klämpfl, Lobinger, & Raab, 2013).

As identified in the previous review of literature, research exclusively examining LMS is limited (e.g., Collins, Morris & Trower, 1999; Day et al., 2006; Silva, 1994), with much of the evidence remaining inconclusive and anecdotal. Several reports have been presented by coaches, and include recommendations for treatment methods focusing on breaking down and re-learning affected skill-chains (e.g., Tenn, 1995a, 1995b). Psychological explanations for the cause of LMS have included increased stress, anxiety, low self-esteem, increased conscious control, phobia, anxiety, and lack of motivation (Collins et al., 1999; Day et al., 2006; Silva, 1994). Additional explanations have suggested that LMS is caused by inadequate skill acquisition, which, when coupled with increased pressure from various sources, leads to a series of negative emotional reactions and subsequent skill breakdown (e.g., Day et al., 2006). Interestingly, research has suggested that LMS-affected athletes remain in possession of the motor programme for the skill, and are still physically capable of performing it, but are temporarily prevented from accessing it (Silva, 1994). This reinforces the notion that LMS is psychological, rather than a physical skill-based problem.

The preceding review of literature, and more extensive discussion provided in chapter two of this thesis, suggest that both the yips and LMS involve several

psychological components. Specifically, both the yips and LMS appear to involve a combination of emotional (e.g., fear, sadness), cognitive (e.g., anxiety, worry), physical (e.g., muscle tension, spasms), and wider impact components (e.g., avoidance behavior, loss of sleep). However, the real extent to which these components underpin the lived experience of the yips/LMS, and therefore provide evidence towards their classification as psychological problems is yet to be explored. This is important if performance problems of this kind are to be appropriately diagnosed. If it transpires that the lived experiences of these performance issues are underpinned by psychological components, it might be possible to develop more effective treatment methods not previously explored. Furthermore, although several reports have emerged associating similar symptoms with both the yips and LMS, the true extent to which they might be similar problems irrespective of sport is yet to be quantified.

3.2 Aims of Study One

The aims of study one are two fold; the first aim is to explore the psychological components of the yips and LMS, according to the lived experience of affected individuals. By further examining these components we hope to establish a better understanding of the degree to which these problems are similar, and can therefore be considered using similar criteria for identification. Consequently, the second aim of this study is to develop a generic classification, and more complete taxonomy of these disorders that can be applied across, and within sport. This might in turn have practical implications for intervention and treatment.

3.3 Method

3.3.1 Participants.

With institutional ethics approval³, 16 athletes (14 male, 2 female) aged between 17 and 61 years ($M_{\text{age yips}} = 45 \pm 13.87$ years; $M_{\text{age LMS}} = 31.75 \pm 9.25$ years) were interviewed. The age range between the two groups was expected due to the difference in sports associated with the two problems, and therefore the average age at which an athlete in that sport might be competing to at least National level. Eight of the athletes were considered to be experiencing the yips, and the remaining eight were experiencing LMS. Participants' suitability for inclusion in the yips group was assessed in line with criteria outlined by Smith et al. (2000), and also adopted in previous research (e.g., Rotheram et al., 2007). That is, participants were experiencing abnormal movements in the hand or forearms by self-description and professional observation (by a professional coach and/sport psychologist). This abnormality was defined as jerking, shaking or freezing of the limbs required for the execution of a previously mastered skill (e.g., jerking of the wrist when putting in golf/the hand locking, and preventing intended release of the ball when bowling in cricket). In line with previous research (e.g., Day et al., 2006), participants' suitability for inclusion in the LMS group was assessed according to the following criteria defined by Tenn (1995a): a) an inability to take off for at least one somersault when previously able; b) an inability to perform a somersault with a certain degree of twist when previously able; c) unintentionally executing a different move midway through a skill chain; d) an inability to land a particular move when previously able. In line with previous research (e.g., Day et al., 2006), participants were required to meet one or more of the criteria according to the particular move affected.

³ Ethical clearance for study one was applied for and approved by the Sheffield Hallam Ethics committee (see Appendix 2).

All participants were referred by an appropriately qualified sport psychologist (HCPC registered and/BPS Chartered), and were considered to be currently experiencing the yips or LMS for a period of at least three months. To control for the yips and LMS due to fear of re-injury, participants who met these criteria as a direct result of injury or accident were not included in the study. All athletes had competed at a minimum of National level. Due to the nature of the study, and the intention of producing findings relevant to several individuals, participants represented four individual sports (trampolining, $N = 4$; gymnastics, $N = 1$; diving, $N = 3$; golf, $N = 5$), and one team sport (cricket, $N = 3$). These sports were identified based on existing research exploring the yips and LMS. All participants provided written consent, and each interview was audiotaped to enable later transcription.

3.3.2 Procedure.

It has been established that qualitative enquiry based upon responses to open ended questions permits one to understand the world as seen by the respondents (Patton, 2002). Qualitative methods adopted in the current study require that the researcher present a balance of existing knowledge with information derived directly from gathered data (Morse & Richards, 2002). Therefore, a thorough review of existing research provided the rationale for the study, and informed the development of a semi-structured interview guide⁴ that was further tested in a pilot study. A pilot study was undertaken to enable the primary researcher to gain experience of the interview process, and familiarise themselves with the questions being asked. Within the pilot study, the athlete participating confirmed that the interview had exhausted all areas relating to their experience. Interviews with each athlete were conducted by the primary researcher and due to the exploratory nature of the topic, a semi-structured

⁴ See Appendix 3 for a copy of the interview guide used in study one.

interview guide was followed whilst allowing conversation to dictate the direction of questioning (e.g., Patton, 2002). On conclusion of the interviews all participants had been asked the main questions from the interview guide.

3.3.3 Interview schedule.

Before each interview the researcher provided participants with standardised comments regarding the purpose of the study, use of data, issues regarding confidentiality, anonymity, and data protection, and provided opportunity for any questions participants had regarding their involvement. Participants were informed that the aim of the study was to explore their lived experience of the yips/LMS in sport. Based on existing literature (e.g., Bawden & Maynard, 2001; Roberts et al., 2013; Rotheram et al., 2007; 2012), the interview focussed on the emotional, cognitive, and physical components experienced in the moment, as these components have previously been identified as symptoms of both the yips and LMS. Further discussion addressed any wider impact responses that participants had as a result of their yips/LMS experience. Participants were reminded that there were no right or wrong answers, to take their time in answering each question, and that they were free to ask for further explanation should clarification of any question be required, and finally that they were free to withdraw from the study at any point (Moss, 1979).

The interviews began with an open-ended question asking the participants about their lived experience of either the yips/LMS (i.e., Can you start by telling me about your experience of [the yips/LMS]?). Since the purpose of the interviews was to explore each athlete's personal experience, complete definitions of the yips and LMS were not provided. After gaining an understanding of the athlete's experience, specific questions introduced each of the four themes: the individual's emotion (i.e., can you tell me about the emotions attached to the experience?), cognitions (i.e., can

you tell me about what was going through your mind at the time?), their physical experience (i.e., can you describe how the experience felt physically?), and finally, any wider impact resulting from the experience (i.e., can you tell me how the experience impacted on your life outside of [sport]).

To ensure an accurate and in-depth understanding of what participants were describing, and provide consistent depth of discussion across all interviews, elaboration probes were used and clarification was sought where necessary (Patton, 2002). However, given that none of the athletes had difficulty discussing the nature of their experiences, very little elaboration was required. Before closing the interview, the primary researcher discussed the interview experience and asked athletes about any further relevant information associated with their experience that may have been overlooked during the process. Again, none of the participants wished to add anything at this point. Interviews were an average of 49 minutes ($M_{\text{mins}} = 49.31, \pm 8.55$ minutes), and were tape recorded in their entirety.

3.3.4 Analysis.

Using a combination of inductive and deductive content analysis, the primary researcher transcribed all interviews verbatim prior to each being content analysed by three different researchers (Miles & Huberman, 1994). Four pre-determined higher order themes (emotion, cognition, psychical experience, and wider impact) directed the deductive analysis phase. Three of the authors independently read and re-read the interview transcripts, manually identifying the raw data responses representing the four a priori higher-order themes. Raw data themes were then organised into lower-order themes under each higher-order theme. For example, within the higher-order theme of emotion, 'panic' and 'freaked out' were grouped together to form the lower-order theme 'Panic'. Frequency of response was reported for each of the raw data,

lower, and higher order themes. These frequencies informed discussion of results in relation to the most dominant themes, and consequently similarities between the yips and LMS. To increase trustworthiness and credibility of the data, consensus was reached for all themes during each stage of the analysis through a series of meetings with the research team. Following the analysis process one final meeting took place with the entire research team where any concerns were addressed and discussed, revisiting the raw data until consensus was reached. This meeting lasted approximately 150 minutes. On completion of the analysis phase, a summary of the results, together with a copy of the individual's interview transcript was emailed to each participant asking them to confirm that an accurate interpretation of their experience had been made.

We acknowledge that using existing theory to drive a qualitative investigation can sometimes compromise the researcher's ability to pay attention to the respondent's view, and might limit the extent to which the investigation is truly inductive. However, we feel that the benefits of drawing on existing literature looking at the causes of, and responses too either the yips or LMS (as separate entities), allowed us to gain a deeper understating of the lived experience of the problems without replicating existing research.

3.4 Results

Results are presented in four main sections representing the four higher-order themes; first, the emotions pertaining to the participants lived experience of the yips/LMS are presented, followed by the cognitive, and then physical sensations described by the athletes during the lived experience. The characteristics associated with the wider impact of the yips/LMS are outlined in the final section, and the number of yips-affected and LMS-affected participants citing each raw data response

and lower-order theme are shown in brackets (yips/LMS; see Figure 3.1). To give the reader an accurate impression of the participants' experiences of the yips and LMS, thick descriptive quotes are presented throughout. It should be noted that while it was sometimes difficult to clearly distinguish between the emotions and cognitions of the lived experience, and those relating to the wider impact, all themes were discussed in detail until consensus was reached between all authors. For the sake of clarity, the results are presented separately for each theme. Due to the extensiveness of raw data generated, the following sections describe the most prominent themes; a full illustration of all themes is provided in Figure 3.1.

3.4.1 Emotion.

Participants were asked to describe their first experience of the yips or LMS, and the situation in which it occurred. They were then asked to describe the main emotions that they experienced during the event. Within this higher-order theme, 17 raw data themes were identified and organised into seven lower-order themes: fear, trapped, frustration, anger, sadness, panic, and shock.

The most frequently cited lower-order theme contained responses from 13 participants and characterised athletes' feelings of fear being part of their yips/LMS experience. Specifically, one yips participant described that "the primary emotion is definitely fear, you're being governed by fear just genuine fear....you're absolutely tearing yourself to bits." Another yips participant stated "I think it's driven by fear, it frightened me to death, I was in extreme fear," while an LMS participant discussed feeling "so scared, it's overpowering, so scared at that point you don't care what other people are thinking, you know, so scared in yourself, you feel the same sort of scared every time it happens." The above citations highlight that fear is the primary emotion experienced during the yips and LMS, which might in part be associated to feeling out

of control. For example, one LMS participant said, “it’s a scary thing to go, you know, ‘oooh’ I’m not in control of my own body. You just feel fear because you can’t control yourself,” while another LMS participant said, “it’s fear of losing control of your body and fear of not being in control, all these sorts of things you know, just come together in fear.”

In another of the lower-order themes representing the emotional aspect, 11 participants described the anger they felt. Specifically, one yips participant reported that, “the frustration manifests itself in anger and aggression because there’s no logic to what’s happening and why you’re doing it I was helpless.” The feeling of helplessness was also inferred in relation to the theme trapped, when one yips participant described the yips “like being trapped inside a burning building and not being able to get out.” Another discussed “being reliant on something for so long and it just gets taken away there’s nothing you can do...it just destroyed me.”

3.4.2 Cognition.

Participants were asked about what they were thinking during experiences of the yips and LMS. Within this higher-order theme, a total of 27 raw data themes were identified, from which the following three lower-order themes were generated: interrupted images, loss of cognitive control, and cognitive distraction. Loss of cognitive control was the largest of these lower-order themes, consisting of 16 raw data themes. Specifically, all 16 participants who took part in the study described a loss of cognitive control while experiencing the yips and LMS. For example, one LMS participant said, “I had no control over it and I felt like I had lost control of everything I was doing....no focus no control nothing, you’ve lost control of yourself and what you’re thinking and what you’re doing.” Importantly, one participant added, “you can’t control it, [yips] it comes from nowhere.” This was a common theme

reported by all participants, where the experience appeared to manifest in a complete momentary loss of control that came from nowhere. Furthermore, participants described being unable to stop it (the yips or LMS) from happening, reporting things such as “when it takes over I can’t let go of my legs I’m doing something I’m not meant to be doing and I can’t stop it [LMS],” and “I almost feel powerless every time I try to fix it [yips] it overrides what’s going on.” One participant also described, “I couldn’t stop it [yips], I couldn’t control it in the moment, I felt like I couldn’t help it, there was nothing I could do about it.” Several athletes compared the experience to being like: “something in my brain was stopping me...it was as though my brain had taken over my body...I’m trying to control my mind but I can’t stop it [LMS].” Indeed, several athletes made reference to a subconscious component, and feeling like something or someone else was in control at that time. For example, one Olympic athlete said the following about LMS:

This thing sort of takes over like a big monster, it’s a big wrong move monster you know that you can’t get rid of that you can’t exterminate, just like a big blob of nothing it just overtakes anything so it was like this blob had descended. It’s almost as if this cloud descends and the closer you actually are to taking off for the move the more grey it’s becoming and it’s almost this mind monster taking over little bits of your mind like a big blob monster in control.

Participants likened the experience to “being completely possessed,” “like someone hijacks you,” “losing complete awareness,” and “all of a sudden not knowing what your body is going to do...it’s like an external thing coming in and stopping me.” Almost all participants ($n = 15$) talked about having negative thoughts (i.e., “massive negative thinking, negativity dominates”), and/or uncontrollable voices in their head (i.e., “it was like I had two voices in my head, as if there’s a little devil inside you that you can’t control and it always took over”) at the time of the experience, residing in a locked, stuck thought process, or mental block. Importantly,

six athletes talked about going into protection mode, and the yips or LMS somehow protecting them and keeping them safe. The following quote perhaps best represents this:

You're brain thinks you're doing something you shouldn't be doing, it's dangerous and it's telling you don't do it. I think I just shut down. I went into pure survival mode like I think about the amygdala and things, and think about what it does, and you know going into fight flight freeze and protection mechanisms. [LMS]

Other participants described the following: "it's like a protection you protect yourself from something...obviously something subconscious is keeping me safe" [LMS]. Another participant talking about the yips recalled: "something in my mind was going this is a dangerous situation and flicked the switch."

In another of the lower-order themes (cognitive distraction), 10 participants described "uncontrollable voices in my head", which was often coupled with a loss of concentration, and negative thought processes. For example, one yips participant said, "I've tried turning that voice in my brain off, I've tried all sorts of things. It still happens." Finally, eight participants talked about visualising mistakes at the time of the experience, specifically one LMS participant reported, "you go to take off and that's when I visualise it wrong. It's like I'm not meaning to visualise at that point, but it just comes into my mind."

3.4.3 Physical.

Participants were also asked to identify the physical sensations they associated with the yips or LMS experience and more specifically, where in their body they felt it and what that sensation was like. A total of 29 raw data themes emerged from the transcripts and were organised into the following four lower-order themes: tension, locked, stuck or frozen movements, somatic anxiety symptoms, and sudden and unexpected. All participants reported experiencing locked, stuck or frozen

movements. In addition to freezing and locking of limbs, ten athletes described the feeling of “hitting a wall and you’re just stuck.” This is particularly important as it highlights the similarities in physical manifestation of the two problems, despite the obvious differences in skill execution (i.e., bowling a cricket ball, or executing a somersault on a trampoline). In particular, LMS-affected participants referred to “everything going into a lock, so thought processes and your body kind of tense. I was aware of it happening, but being stuck there...like as soon as I would take off something would happen, and I would get stuck in the tuck shape.” Another participant said: “I would freeze and go rigid” [LMS]. Similarly, one yips-affected participant reported that “something just locks and freezes...you’ve got the ball in your hand, but it feels stuck like it won’t come out.” Other LMS participants recalled being “stuck in somersault...just stuck in the air,” and “spinning and spinning just stuck in the air.” While one yips participant said: “the ball was stuck in my hand it wouldn’t come out of my hand.” Other physical symptoms included spasms, tightness/tension and unintentional flicking of the forearms (i.e., “it’s like a sensation of muscle spasm that just happens and I can’t control;” “even just thinking about it I can feel the tightness in my arms of where it’s going to happen”).

In another of the lower-order themes, all participants highlighted that the experience “came from nowhere” and “happens instantaneously”, again providing reference to it being out of their control and something they could not explain.

3.4.4 Wider impact.

In this higher-order theme, participants were asked to discuss anything they experienced as a direct result of suffering the yips or LMS. Specifically, they were asked how the yips or LMS had impacted on their life both in and outside of their sport environment. From a total of 39 raw data themes, seven lower-order themes

were generated: spiralling problem, interrupted sleep, emotional, cognitive, social/relational, coping strategies, and loss. Cognitive impact of the experience was the largest lower-order theme capturing responses from all 16 participants. For example, “frustration at not being able to do a simple move anymore [LMS]” and “worrying about it all the time [yips]” coupled with self-hatred and self-doubt. One participant said, “I beat myself up big time. It’s soul destroying. [LMS]”

In another lower-order theme, emotions experienced as a result of the yips or LMS were highlighted by eight of the 16 athletes. The emotions related to the wider impact of the experience were primarily associated with fear and anxiety. For example: “fear of judgement from other people [yips]” and fear of the skill: “it wasn’t even the fear of the pain or the injury it was just fear of doing the skill. [LMS]” Participants also described the extreme levels of anxiety associated with the experience with references such as: “it’s total anxiety all the time it’s horrific, worrying all the time.” Several participants discussed using avoidance tactics to cope with the problem, ranging from the extremes of avoiding executing the specific move, to avoiding the environment altogether, and in the most extreme case exiting professional sport completely. This was linked to bouts of depression and low mood, as some reported: “it was everywhere before I even got out of bed it was there” [LMS], one yips-affected participant reported: “I suffered depression and anxiety throughout...you feel isolated I didn’t want to be around anyone,” and another said “it completely took over my life, it killed me I was being destructive to myself trying to fix it” [LMS].

Results suggest that while initially both the yips and LMS occurred instantaneously, they then spiralled out of control, and gradually increased in frequency of occurrence. One participant said, “it started and it snowballed and it got

worse and worse and worse and manifested itself in my brain [LMS]”. This quote describes not only the spiralling effect, but also indicates the use of language adopted by all participants in referring to LMS and the yips as an external entity, either using ‘it’ or a more descriptive metaphor. It is possible this may have allowed for some degree of dissociation as a means of coping. Furthermore this quote emphasises the psychological nature of these problems.

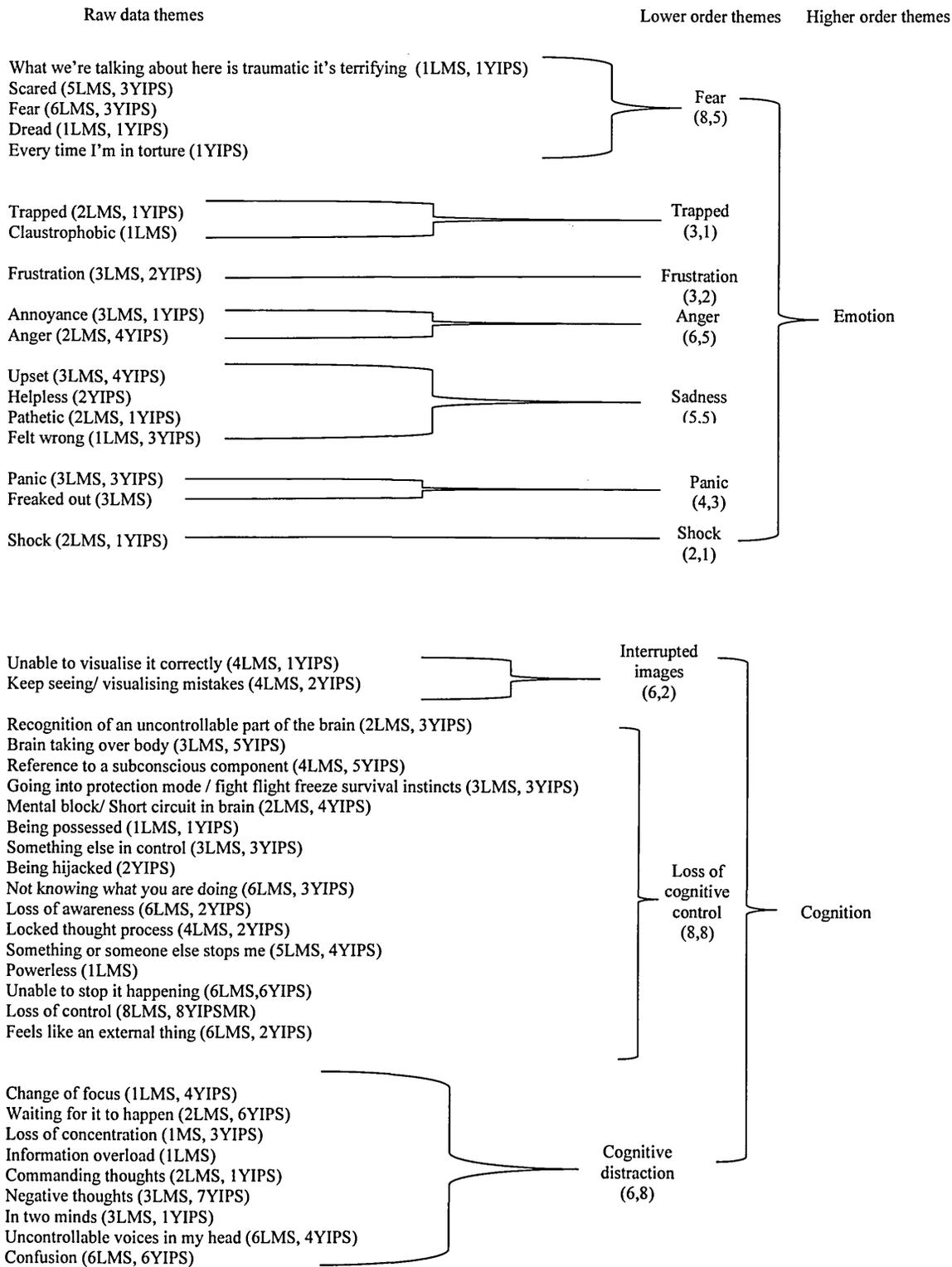
In addition to this spiralling effect, eight athletes discussed transference of the problem to other movement patterns or skills. For example, one cricket bowler said:

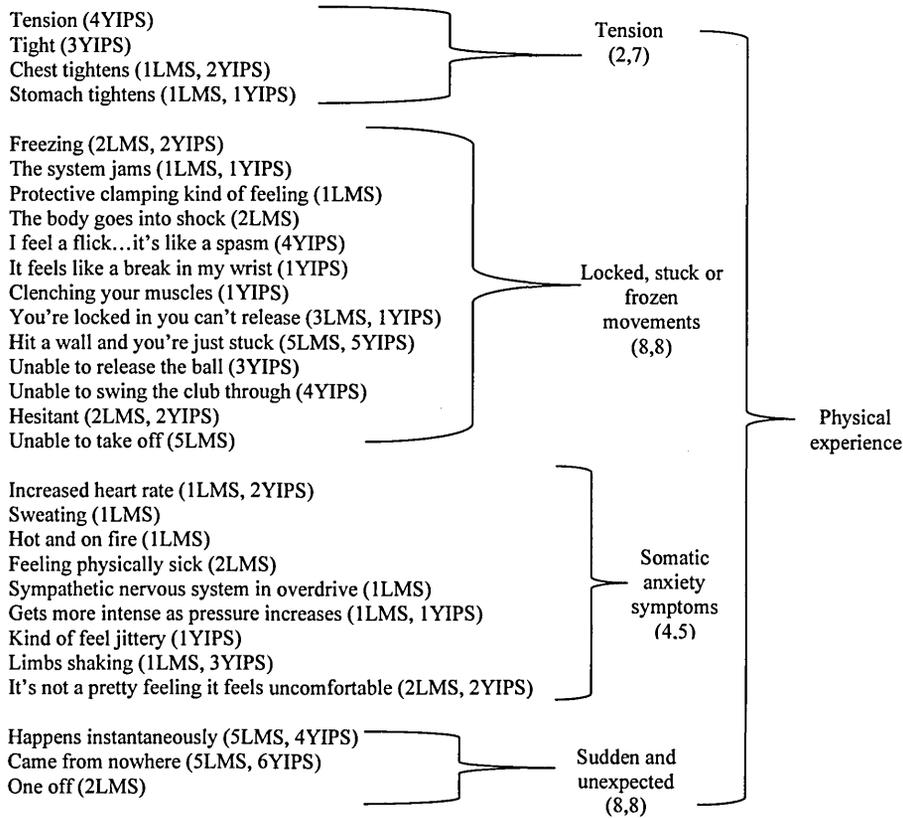
Now in bowling it’s all the time, in every dimension I could go. I don’t think I could bowl in any environment now. That [yips] had a knock on effect with all sorts of things, now it’s throwing that’s the problem, I went to throw a ball and it triggered the same level of fear as in bowling. Just throwing is now so difficult, because actually throwing a ball there’s nothing so simple than throwing somebody something.

Participants also reported similar feelings impacting on social areas as well as other areas of sport: “it is now outside of sport as well I feel it in my body and mind in a similar pattern outside [sport] in my life.”

Four participants discussed repeated nightmares either directly involving the specific move, or the emotions attached (e.g., fear, feeling trapped), while six others expressed inability to sleep or stay asleep due to intrusive thoughts about their experience of the yips or LMS (i.e., “it was mental torture I felt like I hadn’t slept for a month”). The following quote represents one Olympic athlete’s experience:

I have dreams about diving and every time it’s not going well. It’s not winning a championship, always hurting yourself, or something not going well. Whatever I’m doing goes wrong in dreams, but it’s more that you’re under water but you can’t get to the surface so I don’t know what that’s saying. It’s ingrained somewhere. In dreams it’s like you’re drowning, obviously like you can’t breathe, just stifling. In my dreams I get the same sort of scared and if I hadn’t experienced lost move I wouldn’t have these sorts of dreams. [LMS].





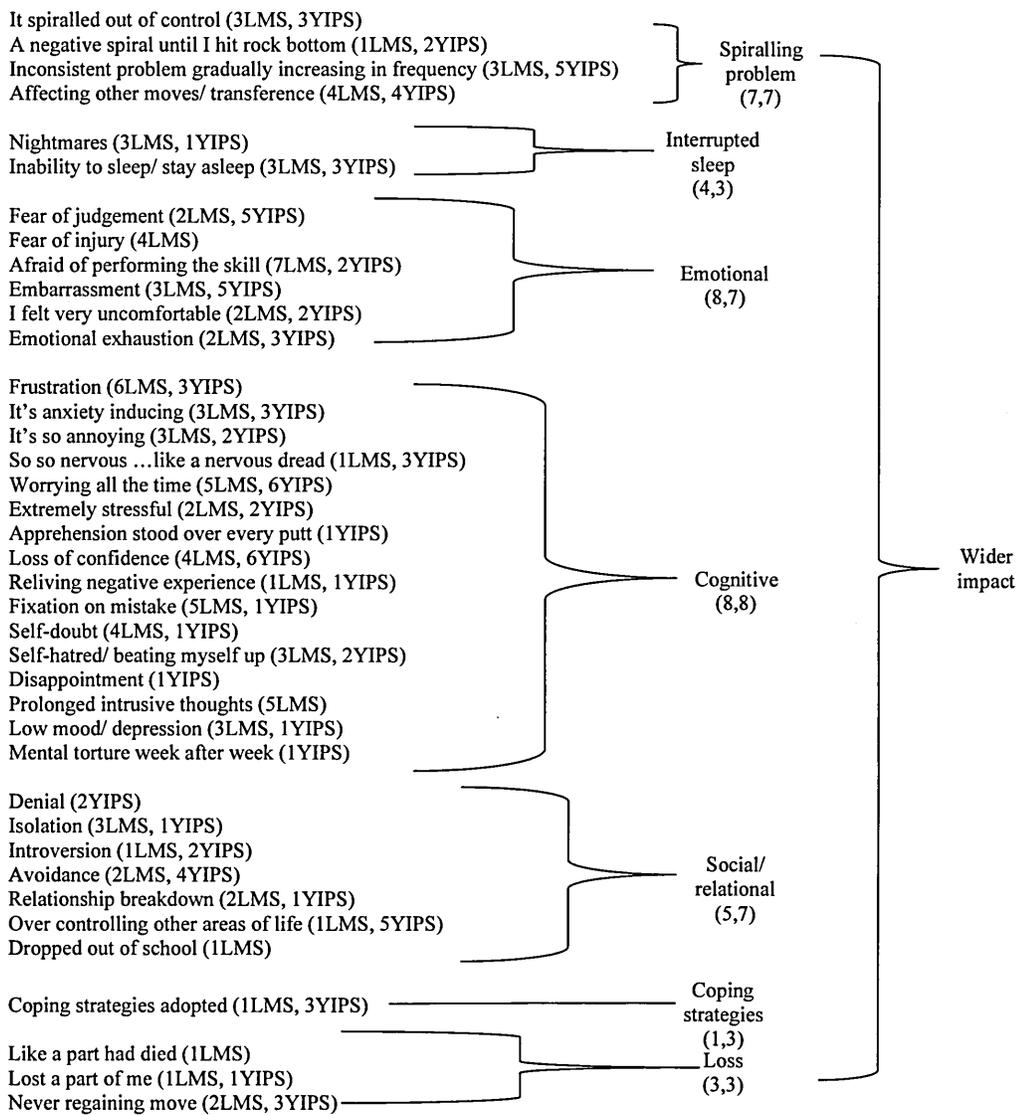


Figure 3.1. Higher-order, lower-order, and raw-data themes outlining psychological characteristics associated with the lived experience of the yips and LMS.

3.5 Discussion

A significant body of literature has been presented that describes performance problems such as the yips and LMS (Day et al., 2006; Philippen & Lobinger, 2012). To date, research has distinguished between these performance issues according to the sport in which they manifest, and consequently they have been considered entirely separate conditions. Furthermore, research has focussed on the potential causes of, and responses to these experiences, rather than their aetiology or underlying architecture. The purpose of the current study was to explore the lived experience of the yips and LMS, and to establish the extent to which these problems might be similar. The use of qualitative interviews allowed for a more thorough exploration of the disorders, providing a deeper understanding of individuals lived experiences, and therefore the phenomenon as a whole.

Findings of the current study go far beyond existing research by indicating that the lived experience of the yips and LMS share emotional, cognitive, and physical components, as well as characteristics pertaining to the wider impact. Furthermore, it appears that both the yips and LMS are underpinned by heightened levels of anxiety, and a loss of cognitive and emotional control, primarily manifesting as fear. These results also indicate that the only factor making the yips and LMS distinguishable is the physical presentation of the disorder, and the nature of locked, stuck, and/frozen movement captured in this lower-order theme (see Figure 3.1). For example, being unable to release the ball, swing the club back, and flicks or spasms in the wrist or forearm, were related to the yips, whereas an inability to take off, executing additional twists, and getting locked in a body position, all emerged as characteristics of LMS only. This perhaps explains why these problems have traditionally been treated using cognitive techniques and movement-based interventions. While it was not a direct aim

of the study, all participants discussed attempting to overcome the yips or LMS using cognitive methods, for example relaxation techniques, positive self-talk, distraction methods, and visualisation. Participants also discussed pursuing talk therapy in an attempt to manage unpleasant emotions, thoughts, and feelings surrounding the experience. All participants reported that none of these techniques had successfully treated their yips or LMS (i.e., “it’s impossible to manage while you’re going through it I tried absolutely everything...I tried everything to get past it but it’s in your head, there’s nothing you can do”). This guides attention towards the less-conscious component reported by all individuals under the lower-order theme ‘loss of cognitive control.’ This would infer that the intensity of emotion involved in the experience might overwhelm the brains capacity for executive functioning.

The results from the present study appear to identify several similarities between the yips and LMS, and symptoms associated with anxiety-related disorders (see DSM-V-TR for detailed criteria; APA, 2013). For example, intense somatic and cognitive anxiety, perceived loss of cognitive control (i.e., the involvement of a less-conscious component), coupled with fear, panic, and/or avoidance behaviour (see Figure 3.1). Specifically, as highlighted in raw data themes, individuals described being powerless to stop it (yips/LMS) from happening, losing cognitive control, and feeling as though something or someone else was in control of their movement, and their brain, something, or someone had taken over their body.

Previous studies of the yips have identified anxiety, and a general loss of movement control associated with execution of the affected skill (Philippen & Lobinger, 2012). Individuals in the current study identified being momentarily unaware of what was happening, and feeling entirely out of control of physical movement and cognitive processes. The loss of mental awareness implies a level of

dissociation at the time of the experience, again alluding to the activation of a less conscious element, similar to anxiety-based disorders. Thus, although parallels can be drawn between the findings of the present study and previous research, the findings highlighted within this investigation provide further evidence of the psychological elements and less conscious processes that seem to be involved in performance breakdowns.

In their study of LMS-affected individuals, Day and colleagues (2006) reported a loss of awareness in space while executing the affected move. The current study better our understanding of this, as both yips and LMS-affected individuals consistently reported that a loss of awareness was coupled with emotions such as intense anxiety, fear, and anger. These findings are particularly important as they demonstrate the high level of emotion, loss of control, and possible less conscious component involved in the lived experience. According to research looking at anxiety-based disorders, symptoms such as fear, anger, and loss of control are underpinned by anxiety, and are triggered as a result of one or several overwhelming emotional experiences (Herbert, 2012). This would certainly explain the escalating nature of the yips and LMS, if similarly to anxiety disorders, individuals become trapped in a cycle of re-experiencing, driven by the need for resolution.

Collectively, the evidence from existing research (e.g., Philippen & Lobinger, 2012; Rotheram et al., 2007), and findings from the current study, suggest that cognitive methods do not effectively treat the yips and LMS (although it was not deliberately questioned participants all discussed using cognitive techniques such as altered technique, visualisation, and distraction with little to no success). Thus, further research would perhaps benefit from exploring current treatment methods for anxiety disorders. Treatment methods for anxiety disorders have traditionally revolved around

talk-therapy and drug prescription, generally offering only surface level, short-term benefits (Ho & Lee, 2012). More recently however, increased interest has been directed toward therapies that address anxiety through the identification and reprocessing of significant life-events. The success of these therapies (e.g., EFT, Craig, 1999; Eye Movement Desensitisation and Reprocessing [EMDR], Shapiro, 2001) in overcoming anxiety-based disorders marks a shift in perspective for effective psychotherapy and mainstream psychology. Assuming that the yips and LMS are underpinned by a substantial level of anxiety, are linked to significant life-events (Rotheram et al., 2012; 2013), and are considered traumatic in themselves (Day et al., 2006), it would follow that these therapies might also provide effective treatment methods for the yips and LMS.

The loss of control, and overwhelming emotional experience presents some similarities to the phenomenon termed by LeDoux (2006), as an *amygdala hijack*. Specifically, LeDoux suggested that an amygdala hijack is: “an irrational response to something that may be no threat at all, causing inconsistency and frustration because you are unable to do what you intend” (Sillitoe, 2013. p.26). This description is not at all dissimilar to the experiences described by participants in the current study, for example: “I get angry and frustrated because I can’t do what I’m intending to do, you’re brain thinks you’re doing something you shouldn’t and is stopping you it’s frustrating because you’re not in control of it.” Interestingly, LeDoux (2014) also differentiated between conscious and less-conscious states of fear. In his most recent paper he suggested that “conscious fear can cause us to act in certain ways, but it is not the cause of the expression of defensive behaviours and physiological responses elicited by threat.” (p. 3). Thus, it is possible that the yips and LMS might be associated with a less conscious state of fear in response to threatening stimuli, and

again suggests treatment methods not solely focussed on conscious mechanisms should be investigated.

While causality of the yips and LMS cannot be ascertained from this study, some participants alluded to the loss of physical control triggering the emotional response. For example, being in an extreme state of fear because they felt totally out of control physically (i.e., loss of movement control), while others described being out of control of their emotions (i.e., suddenly overwhelmed with fear, panic, scared). This was coupled with frustration and anger towards the unpredictable nature of the phenomena, and inability to perform a movement as they both expected and intended. This would support LeDoux's (2014) differentiation between two fear states, the less-conscious fear state driving the reported loss of conscious control and unexpected flood of emotional, and preceding a conscious level of fear coupled with reactive symptoms, for example anger and frustration. All individuals identified that the occurrence of the yips or LMS was both instantaneous, and unexpected (see lower-order theme 'sudden and unexpected,' Figure 3.1), again alluding to a perceived loss of control. Furthermore, it appears that these problems inhabit a spiralling effect following the initial experience, gradually worsening in frequency and intensity.

The qualitative approach employed in the present study resulted in the identification of additional psychological components not highlighted by previous research (e.g., Bawden & Maynard, 2001; Day et al., 2006; Silva, 1994). For example, anxiety and fear appear to be related to the apparent loss of movement control, in many cases also causing breakdown of relationships, loss of self-confidence, and avoidance of the affected environment and/or skill (wider-impact factors). Although the nature in which these components interact cannot be inferred from the present study, however it is possible that the relationship between heightened emotion,

perceived loss of control, and an individual's coping mechanisms aggravates the problem further, as notably not all athletes that experience fear and anxiety will suffer a performance breakdown. Thus, future research would benefit from addressing an athlete's immediate appraisal of these experiences.

Masters and Maxwell (2004) linked performance disruption to personality traits. They suggested that individuals affected by these problems display a predisposition towards internal rehearsal of explicit rules relating to skill execution, and therefore invest conscious control over automatic movement (Masters & Maxwell, 2004). It is therefore possible that the yips and LMS endure as a result of entrapment in a continuous cycle of rumination, perfectionism, and reinvestment (Roberts et al., 2013), coupled with negative expectation and perceived loss of control during movement execution. Interestingly, cognitive rumination has also been linked to anxiety and the development of anxiety-related psychological disorders (Ehring, Frank & Ehlers, 2008). With the involvement of such intense anxiety as reported with the yips/LMS, factors such as cognitive rumination might increase likelihood of these problems reoccurring.

Despite existing debate, it is generally assumed that significant life-experiences and anxiety disorders are associated with psychological, behavioural, and psychophysiological disruption and distress (Shapiro, 2001). Furthermore, research implies that associated environmental stressors can reactivate memories associated with disturbing life-events years after they happened, causing features of the initial event to be re-experienced in the form of psychophysiological, and psychological distress (McFarlane & Yehuda, 2000; Shapiro, 2001). Interestingly, it has been suggested that an individual's experience of significant life-events, provides a strong indicator of their susceptibility to anxiety disorders (Herbert, 2012). This finding is

not dissimilar to suggestions made by Rotheram and colleagues (2012) in their study of yips-affected golfers. In their study, the authors provided evidence of a history of significant life-events (e.g., relationship breakdown, death of a loved one), prior to the initial yips experience. Furthermore, adopting a treatment method that focussed on processing these memories, rather than the actual yips experience, subsequently alleviated the yips symptoms.

Additional similarities between the yips/LMS and anxiety disorders emerging from the current study included disturbing memories, nightmares, and flashbacks related to the experience (see Figure 3.1 wider-impact factors). Individuals also attempted to block intrusive thoughts and feelings associated with the yips/LMS, potentially exacerbated by ruminative habits. These reports were captured under the lower-order themes ‘social relational,’ and ‘coping mechanisms’). Several others reported extreme avoidance behaviour towards both the sporting environment and social areas, behaviours commonly symptomatic of social-anxieties, fears, and phobia (where anxiety is thought to maintain the cycle). Individuals described being unable to visualise execution of the affected skill, and several were also unable to clearly recollect the yips/LMS experience, visualising blocks, or momentary blackout. Difficulty recalling aspects of an event is commonly associated with memories involving heightened levels of emotion such as traumatic experiences. The level of emotion during these experiences overwhelms the brains capacity to attend to all incoming stimuli, and appropriately process the event, thus rendering details of the experience missing. Due to the heightened levels of emotion and distress involved with the yips and LMS it is perhaps not surprising that participants reported loss of memory and mental blocks. Finally, all individual’s reported having prolonged negative emotions relating to the yips/LMS (e.g., fear, embarrassment, frustration), in

addition to increased feelings of self-hatred, self-doubt, and loss of confidence (see Figure 3.1 'wider-impact'), symptoms frequently associated with anxiety disorders.

3.6 Summary and Concluding Remarks

The purpose of study one was to investigate two of the most prominent forms of performance breakdown from the perspective of World Class sports performers. The use of qualitative interviews enabled in-depth exploration of the lived experience of the yips and LMS, and therefore resulted in contributions to the literature that haven't previously been addressed. In addition to psychological components, emotional, physical, and wider impact factors were discussed in relation to the yips and LMS, and provide evidence towards the extent to which the yips and LMS are similar. Specifically, the results highlight a loss of cognitive, emotional, and physical control, coupled with intense anxiety, and it appears that only task specific differences (i.e., physical presentation affecting the target skill) might distinguish between the two. Consequently, this study has provided a broad holistic view of the underlying components of the yips and LMS, and provides evidence to suggest that the language currently used to distinguish between these two experiences ought to be reconsidered. One expression that appears to capture the shared experience described by all participants is *performance block* (e.g., it's like hitting a wall and you're stuck; everything goes into lock; something just locks and freezes; it's like something's blocking you and you're stuck), characterised by a sudden and temporary loss of fine, and/or gross motor and cognitive control, manifesting as locked, stuck, or frozen movements. Symptoms including intense anxiety, fear, and panic, coupled with somatic anxiety symptoms, are heightened during an experiential loss of emotional, cognitive, and physical control, and these problems appear to affect previously mastered sports skills with no known trigger.

Similarities were found between the yips and LMS, and symptoms associated with anxiety-related disorders (e.g., anxiety, fear, intrusive thoughts, avoidance behaviour). A central finding of this study was the underpinning anxiety, loss of control, and less-conscious component. To date these problems have been treated as movement disorders, focussing on physical symptoms. However, the findings of this study suggest that they are underpinned by psychological components such as anxiety, and that physical movement disruption makes them apparent. Indeed, individuals in the current study failed to overcome the yips/LMS using cognitive behavioural techniques, or technical modifications. Thus, from a practical perspective the findings have implications for sport psychologists providing support to athletes suffering this type of disorder. Evidently, the development of interventions targeted towards treating the yips/LMS among World Class performers is warranted.

Previous research has suggested that an individual's personality characteristics might play a role in the manifestation and maintenance of these problems (Rotheram et al., 2012). Findings from the current study also highlight the recurrence of intrusive thought patterns indicative of rumination, and obsessive cyclical attempts at problem solving, or reinvestment. Considering the consistent intensity of anxiety involved in these two problems, and the similarities between the yips and LMS, and the yips and dystonia, it is possible that individual personality characteristic's also impact on the development of the yips and LMS. Understanding the extent to which these factors are involved in the manifestation of the yips and LMS might have implications for the development of more robust interventions, not only targeted towards treatment but also towards protecting athletes against these problems. As such, study two will adopt existing psychometric measures to assess personality characteristics in individuals affected by the yips and LMS.

CHAPTER IV

4.0 Study Two

Yips And Lost Move Syndrome: Assessing Impact And Exploring Levels Of Perfectionism, Rumination, And Reinvestment⁵

4.1 Introduction

Study one explored the psychological nature of two common performance problems, the yips and *lost move syndrome* (LMS). Findings from this study revealed emotional, cognitive, and physical factors, as well as those associated with the wider impact of experiencing the yips/LMS. A key component was the heightened level of anxiety involved. It also emerged that specific individual characteristics might be involved in both onset and longevity of these problems. For example, participants reported obsessive patterns of thought, involuntary obsessive behaviours, reinvestment in solving the problem, and self-critical thinking related to the experience. In several instances bouts of depression and avoidance behaviour were also reported.

These findings build on research presented in a more comprehensive review of literature in chapter two of this thesis, where links between the yips, obsessive habits, perfectionism, and reinvestment were highlighted (e.g., Roberts et al., 2013). These characteristics have also been associated with anxiety-related disorders (Taylor, 2014), and identified as potential maintaining and/mediating factors in onset and longevity of symptoms such as avoidance, anxiety, depression, and self-criticism (Flett et al., 1998). In recent years there has been a trend to examine specific personality characteristics that might increase susceptibility to developing anxiety-related disorders, dystonia, and other movement disorders (e.g., Brooks, Theil, Angerstein & Dressler, 1998; Jabush & Altenmuller, 2004). Perfectionism, for

⁵ The study reported in this chapter is in press: Bennett, J., Rotheram, M., Hays, K., Olusoga, P., Maynard, I. W., & Lindsay, P. (in press). Yips and lost move syndrome: Assessing impact and exploring levels of perfectionism, rumination and reinvestment. *Sport and Exercise Psychology Review*.

example, is considered to be a consistent predictor of anxiety across a range of populations, including *post-traumatic stress disorder* (PTSD), *obsessive-compulsive disorder* (OCD), *panic disorder*, and *depression* (Egan, Hattaway & Kane, 2013; Ehring & Watkins, 2008; Frost & Henderson, 1991; Hall, Kerr & Matthews, 1998). It has also been predicted that individuals with perfectionistic tendencies experience higher levels of anxiety following a perceived setback or mistake.

Several conceptualisations of perfectionism have been proposed, although to date, the *Frost multidimensional perfectionism scale* (FMPS; Frost, Marten, Lahart & Rosenblate, 1990) remains one of the most widely accepted (e.g., Koivula, Hassmen & Fallby, 2002; Philippen & Lobinger, 2012; Roberts et al., 2013). Using this model, Egan, Wade and Shafran (2011) reviewed the role of perfectionism across a number of psychological issues (e.g., anxiety disorders, depression, and eating disorders), and supported the notion that perfectionism embodies both cognitive and behavioural characteristics that increase vulnerability to a number of psychological disorders (e.g., obsessive actions, extreme vigilance, and body control behaviour; Yang & Stoeber, 2012). Furthermore, perfectionism, coupled with self-criticism, has been associated with negative self-defeating outcomes on behaviour (e.g., depression, body image dissatisfaction, avoidance behaviour; Flett & Hewitt, 2008). Given the major factors associated with the yips and LMS (e.g., anxiety, intrusive negative thoughts, obsessive thinking), it is possible that perfectionism might be an antecedent of these problems, and might also exacerbate responses to the disorders.

Flett and colleagues (1998) suggested that psychological distress associated with recurrent perfectionistic thinking patterns, was intensified by ruminative thought patterns. Rumination involves conscious thoughts, images, and/memories revolving of the causes, symptoms, and consequences of a significant event that recur without

intention (Nolen-Hoeksema, 2000). Michael, Halligan, Clark, and Ehlers (2007) suggested that rumination maintains anxiety as a result of repeatedly focusing on “why” and “what if” questions, rather than appropriately rationalizing and processing an event. Flett and Hewitt (2008) also suggested that perfectionists ruminate more about failure and making mistakes in particular.

Flett, Madorsky, Hewitt and Heisel (2002) investigated the extent to which perfectionism is associated with rumination and cognitive intrusion, in response to a particularly stressful experience. The authors administered the FMPS, the *ruminative response scale* (RRS; Nolen-Hoeksema, 1991), and the *impact of events scale* (IES; Zilberg, Weiss & Horowitz, 1982) to a sample of 65 individuals. Results indicated that high-levels of perfectionism and rumination were associated with depression and anxiety following a traumatic experience. These findings support the notion that perfectionism and rumination contribute to psychological distress and anxiety following trauma. Given that anxiety, along with recurrent thoughts, images, and memories, are central components of the yips and LMS, it is feasible to assume that increased levels of both perfectionism and rumination might also be present. In an attempt to address this, Roberts et al. (2013) administered a shortened version of the FMPS to sample of 60 yips-affected athletes from golf, cricket, and darts. The aim of this study was to assess levels of maladaptive perfectionism, obsessional thought processes, and self-consciousness. Findings from this study revealed significant differences on all factors compared to a sport-matched control group. Thus, future research should look to extend this finding to other yips-affected individuals, and investigate if similar relationships are associated with LMS.

Study one of this thesis extended previous research, demonstrating that individuals experiencing the yips and LMS obsess over the problem in a highly self-

critical manner. Furthermore, it emerged that affected individuals display high-levels of self-focused awareness, specifically attending to physical sensations, thoughts, and emotions associated with the affected skill. Masters (1992) referred to the conscious awareness of explicit declarative knowledge to control movement as *reinvestment*. Reinvestment posits that under increased anxiety, performers will reinvest conscious control of movement execution inhibiting automatic processing (Masters, 1992). A substantial amount of research has demonstrated the effects of self-focus and rumination in exacerbating anxiety-related disorders (Morrison & Heimberg, 2013). Research has also reported links between *focal dystonia* and self-conscious reinvestment (Grattan et al., 2001). Given the major role anxiety appears to play in the yips and LMS, and the similarities between the yips, LMS, dystonia, and anxiety-related disorders, one might expect to see similar patterns of self-focussed reinvestment emerging in the yips and LMS.

4.2 Aims of the current study

The aim of the current study is two-fold: First, to examine whether the yips and LMS are associated with higher-levels of perfectionism, rumination, and reinvestment when compared with matched controls; second, to explore whether individuals who experience the yips/LMS perceive worst performance experiences as more stressful than controls. It is expected that perfectionism, rumination, and reinvestment will be similarly high in both the yips and LMS groups. It is also predicted that individuals experiencing the yips and LMS will report significantly higher scores on the *impact of event scale* (IES) than matched control groups. It is envisaged that the present study will provide further support for findings of study one, and also advance our understanding of the antecedents involved.

4.3 Method

4.3.1 Participants.

With institutional ethics approval⁶, 60 participants (41 men, 19 women) took part in the study. Fifteen were considered to be experiencing the yips (cricket, $n = 8$; golf, $n = 4$; darts, $n = 3$; $M_{\text{age}} = 37.0$, $SD = 14.33$), 15 were considered to be experiencing LMS (diving, $n = 2$; trampolining, $n = 9$; gymnastics, $n = 4$; $M_{\text{age}} = 25.0$, $SD = 6.65$), the remaining participants formed two control groups, each consisting of 15 non-yips sufferers (cricket, $n = 8$; golf, $n = 4$; darts, $n = 3$; $M_{\text{age}} = 33.53$, $SD = 13.51$), and 15 non-LMS sufferers (diving, $n = 2$; trampolining, $n = 9$; gymnastics, $n = 4$; $M_{\text{age}} = 25.73$, $SD = 4.71$). Participants had an average of 14 years playing experience at a minimum of National level or equivalent (yips $M_{\text{years}} = 17.9$, $SD = 7.3$; LMS $M_{\text{years}} = 10.5$, $SD = 4.3$; yips control group $M_{\text{years}} = 15.20$, $SD = 7.25$; LMS control group $M_{\text{years}} = 11.93$, $SD = 4.45$).

Inclusion in the yips group was assessed according to criteria outlined by Smith et al. (2000), and also adhered to in previous research (e.g., Rotheram et al., 2007). That is, participants were experiencing abnormal movements in the hand or forearms, defined as jerking, shaking or freezing of the movement, when executing a previously mastered skill (e.g., putting in golf/bowling in cricket). Inclusion in the LMS group was assessed using the following criteria outlined by Tenn (1995a), and used in previous studies (e.g., Day et al., 2006): a) an inability to take off for at least one somersault when previously able; b) an inability to perform a somersault with a certain degree of twist when previously able; c) unintentionally executing a different move midway through a skill chain; and/ or d) an inability to land a particular move when previously able. All participants were identified as experiencing the yips or

⁶ Ethical clearance for study two was applied for and approved by the Sheffield Hallam Ethics committee (see Appendix 5).

LMS by self-description and professional observation, and were required to have been experiencing the problems for a period of at least three-months. Participants who met these criteria as a direct result of injury or accident were not included in the study, to rule out symptoms experienced simply due to fear of re-injury (Day et al., 2006).

Sport psychologists were contacted via email and provided with information regarding the study purpose and selection criteria for participants. They were asked to contact any participants they considered suitable for participation, and, with their consent, identify them to the primary researcher. Participants included in the control groups had never experienced a physical skill disruption of any skill in their main or subsidiary sport, and had never been diagnosed with a movement disorder.

Participants were matched by age, gender, sport, and ability.

4.3.2 Procedure.

Before completing the measures, participants were contacted by email, and provided with standardised information regarding the purpose of the study, use of data, issues regarding confidentiality, anonymity, and data protection. They were also given the opportunity to ask any questions they might have prior to consenting.

Participants then received an email from the primary researcher containing the measures and instructions for their completion. The order in which participants were instructed to complete the measures was randomised to avoid order effects.

Participants were informed that by completing the measures they were consenting to participate. Once returned, all measures were entered into a Microsoft Excel spreadsheet (Microsoft Corporation, USA), and stored in a password-protected file. Access to this file was by the primary research team only. Participants were informed that they could withdraw their data at any point up until submission of the study for review.

4.3.3 Psychometric measures.

Participants were asked to take part in a study exploring the relationship between personality characteristics and performance breakdown in sport. Participants completed the following scales:

4.3.3.1 Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990)⁷.

The FMPS assesses the six dimensions of perfectionism (i.e., personal standards, organisation, concern over mistakes, doubts about actions, parental expectations, and parental criticism). Using a scale of 1 to 5 (where 1 = *strongly disagree*; 5 = *strongly agree*), participants are required to respond to a series of questions assessing each dimension. For example, concern over mistakes was measured using items like: “I hate being less than the best at things”, and “I should be upset if I make a mistake”. Frost et al. (1990) reported the Cronbach’s alpha for functional ($\alpha = 0.89$) and dysfunctional ($\alpha = 0.91$) perfectionism to be satisfactory, as well as the internal consistency for the subscales ($\alpha = 0.73 - 0.93$) and the overall scale ($\alpha = 0.90$). Although the use of domain specific measures is recommended (e.g., Gotwals, Dunn, Causgrove Dunn, & Gamache, 2010; Stoeber & Stoeber, 2009), it was felt that previous use of the FMPS as a measure of perfectionism among yips-affected athletes (e.g., Roberts et al., 2013), and among individuals experiencing emotional distress, anxiety-related disorders, and dystonia (Harris, Pepper & Maack, 2008), justified its use here. Indeed, the current study aimed to assess perfectionism in relation to two performance problems underpinned by various psychological components (e.g., anxiety, fear, negative thinking, panic, avoidance), similar to those reported in the above disorders (Roberts et al., 2013).

⁷ See appendix 6 for an example of the Frost Multidimensional Perfectionism Scale.

4.3.3.2 Ruminative Response Scale (RRS; Nolen-Hoeksema, 1991)⁸.

The RRS is a self-report measure of rumination in which participants rate 22 statements about how often they engage in ruminative responses following negative emotional affect, using a scale from 1 (*almost never*), to 4 (*almost always*).

Ruminative brooding was considered by items such as “I think what am I doing to deserve this?” Ruminative reflection was considered using items such as “go someplace alone to think about your feelings”, and ruminative depression was considered using items such as “I think why can’t I get going?” Nolen-Hoeksema (2000) indicated that the RRS has adequate internal consistency ($\alpha = .82$), and test-retest reliability over a 1 year period ($r = 0.47, p < .001$).

4.3.3.3 Reinvestment Scale (Masters et al., 1993)⁹.

The reinvestment scale contains 20 items drawn from three scales considered to be predictive of an individual’s tendency to reinvest in controlled processing. Specifically, 12 items are taken from the *self-consciousness scale* (e.g., “I am aware of the way my mind works when I work through a problem”; Fenigstein, Scheier & Buss, 1975). A further seven items are taken from the rehearsal factor of the *emotional control questionnaire* (e.g., “I often find myself thinking over and over about things that have made me angry”; Roger & Neshoever, 1987). The final item is borrowed from the *cognitive failures questionnaire* (e.g., “do you have trouble making up your mind?”; Broadbent, Cooper, Fitzgerald & Parkes, 1982). Masters et al. (1993) indicated that the reinvestment scale has adequate internal reliability for use in sport ($\alpha = 0.86$), and test-retest reliability over a four-month period ($r = 0.74$).

⁸ See appendix 7 for an example of the Ruminative Response Scale.

⁹ See appendix 8 for an example of the Reinvestment Scale.

4.3.3.4 Impact of Events Scale (IES; Zilberg, Weiss & Horowitz, 1982)¹⁰.

The IES is a 22-item self-report measure, and is widely used for the assessment of traumatic experience responses (Joseph, 2000). The measure has been specifically used to assess the symptoms of anxiety-related disorders, namely intrusion (intrusively experienced ideas, images, feelings, and/dreams) and avoidance (conscious avoidance of ideas, feelings or situations related to the event) (cf. Sundin & Horowitz, 2002). Considering the factors that appear to be defining characteristics of the yips and LMS (e.g., intrusive cognitions, increased fear, and somatic anxiety symptoms, avoidance behaviour), it is felt that the IES also offers an appropriate means of assessment for the current study. Furthermore, research has demonstrated that the content of experience represented by the IES is similar for type of event and patient versus non-patient samples (Zilberg, Weiss & Horowitz, 1982). Participants were asked to respond to each statement indicating the level of distress they experienced during their worst performance experience. Distress level was reported using a scale of 0 (*not at all*) to 4 (*extremely*), with a total range of 0-88. The three-month time frame was selected to enable the control group to recall a worst performance, while not being overly demanding on memory recall. This time frame is also consistent with previous research assessing significant life-events in various population groups (Sundin & Horowitz, 2002). Intrusive responses were measured by items such as “I thought about it when I didn’t mean to”, avoidance was measured by items such as, “I stayed away from reminders about it”, and physiological arousal was measured by items such as “my feelings about it were kind of numb”. Extensive evidence attesting to the internal reliability and validity of this measure has been

¹⁰ See appendix 9 for an example of the Impact of Events Scale.

reported ($\alpha = .86$; Zilberg, Weiss & Horowitz, 1982), adding further support for its use in the current study.

4.3.4 Analysis.

The data generated in this study satisfied statistical assumptions, and was therefore deemed suitable for further analysis. Subsequently, a series of one-way between-groups ANOVAs were conducted for each of the dependant variables, to test the difference between the yips-affected group, the LMS-affected group, and the matched control groups. Dependant variables were rumination, perfectionism, personal standards, organisation, concern over mistakes, doubts about actions, parental expectations, parental criticism, reinvestment, and IES scores. Follow-up comparisons were conducted using Bonferroni to assess where differences arose. It is suggested that because obtained p -values vary according to the number of participants, they do not provide adequate information regarding the magnitude of an effect (Winter, Abt & Nevill, 2014). Thus, to identify the extent to which the results were meaningful; outcomes were evaluated using effect sizes, and 95% confidence intervals (CI; Cumming, 2012). Alpha was set to 0.05, and p -values were supported by effect-size statistics in line with Cohen's d (d) (1988), where differences in effect were considered to be either trivial (0.19), small (0.20 - 0.49), medium (0.50 - 0.79), or large (≥ 0.80). Because this study had two independent control groups, a pooled standard deviation was used as the denominator to determine effect sizes (Mullineaux, Bartlett & Bennett, 2001).

4.4 Results

The purpose of the current study was to investigate whether the yips and LMS are associated with higher-levels of perfectionism, rumination, and reinvestment, and whether the experience of these problems is equivalent to trauma. Importantly,

ANOVA revealed no differences between the yips and LMS groups on any of the dependant variables. Our analysis did reveal several significant differences between the yips and LMS, and the two control groups on all aspects, a full breakdown of mean values and standard deviations for each dependant variable tested is provided in Table 4.1.

Table 4.1. Means (*M*) and Standard Deviations (*SD*) for Group *x* Dependant Variable

	LMS (<i>M</i> ± <i>SD</i>)	yips (<i>M</i> ± <i>SD</i>)	LMS control (<i>M</i> ± <i>SD</i>)	yips control (<i>M</i> ± <i>SD</i>)
Rumination	62.73 ± 12.42	52.07 ± 10.02	37.6 ± 8.85	37.93 ± 11.14
Reinvestment	13.20 ± 1.66	14.00 ± 1.07	8.40 ± 1.35	8.13 ± 1.19
Perfectionism	117.87 ± 7.81	111.80 ± 6.29	67.80 ± 7.86	67.27 ± 8.23
Concern over mistakes	31.00 ± 1.93	29.33 ± 2.87	13.87 ± 3.00	15.733 ± 3.92
Doubts about action	12.33 ± 2.13	11.73 ± 2.49	5.93 ± 1.53	6.87 ± 1.19
Parental expectations	13.07 ± 1.67	11.93 ± 1.67	12.13 ± 2.45	10.60 ± 2.80
Parental concern	11.07 ± 2.76	10.00 ± 1.85	8.27 ± 3.20	6.33 ± 2.44
Personal standards	26.93 ± 3.69	26.13 ± 4.24	13.93 ± 3.81	14.67 ± 2.26
Organisation	23.47 ± 1.85	22.67 ± 1.35	13.00 ± 2.70	13.07 ± 2.34
IES	56.53 ± 9.26	48.87 ± 12.28	30.2 ± 8.45	20.8 ± 7.84

Specifically, a series of one-way between-groups ANOVA's revealed significant differences between the yips and yips control groups on rumination ($F_{(3,56)} = 19.360, p = 0.004, 95\% \text{ CI } [13.81, 14.45], d = 0.42$), perfectionism ($F_{(3,56)} = 195.827, p < 0.001, 95\% \text{ CI } [50.34, 50.86], d = 1.49$), concern over mistakes ($F_{(3,56)} = 131.879, p < 0.001, 95\% \text{ CI } [13.42, 13.78], d = 1.18$), doubts about action, ($F_{(3,56)} = 44.635, p < 0.001, 95\% \text{ CI } [4.73, 4.99], d = 0.91$), personal standards ($F_{(3,56)} = 58.678, p < 0.001, 95\% \text{ CI } [11.29, 11.64], d = 0.80$), parental criticism ($F_{(3,56)} = 9.470, p = 0.002, 95\% \text{ CI } [3.52, 3.81], d = 0.30$), organisation ($F_{(3,56)} = 112.211, p < 0.001, 95\% \text{ CI } [9.47, 9.73], d = 0.94$), reinvestment ($F_{(3,56)} = 80.856, p < 0.001, 95\% \text{ CI } [5.77, 5.97], d = 1.15$), and IES ($F_{(3,56)} = 44.017, p < 0.001, 95\% \text{ CI } [27.75, 28.38], d = 0.87$), revealing a medium to large magnitude of effect. No difference was revealed between the yips and yips control groups on parental expectations ($F_{(3,56)} = 3.203, p = 0.616$), (see Table 4.1 for mean values associated with these results).

Significant differences were also found between the LMS and LMS control groups on rumination ($F_{(3,56)} = 19.360, p < 0.001, 95\% \text{ CI } [24.81, 25.45], d = 0.74$), perfectionism ($F_{(3,56)} = 195.827, p < 0.001, 95\% \text{ CI } [49.80, 50.34], d = 1.67$), concern over mistakes ($F_{(3,56)} = 131.879, p < 0.001, 95\% \text{ CI } [16.98, 17.29], d = 1.48$), doubts about action, ($F_{(3,56)} = 44.635, p < 0.001, 95\% \text{ CI } [6.20, 6.46], d = 1.19$), personal standards ($F_{(3,56)} = 58.678, p < 0.001, 95\% \text{ CI } [12.81, 13.19], d = 0.91$), organisation ($F_{(3,56)} = 112.211, p < 0.001, 95\% \text{ CI } [10.32, 10.62], d = 1.02$), reinvestment ($F_{(3,56)} = 80.856, p < 0.001, 95\% \text{ CI } [4.68, 4.92], d = 0.93$), and IES ($F_{(3,56)} = 44.017, p < 0.001, 95\% \text{ CI } [26.04, 26.63], d = 0.82$), with a medium to large magnitude of effect (see Table 4.1 for respective mean values). No differences were found between the LMS and LMS control groups on parental expectations ($F_{(3,56)} = 3.203, p = 1.000$), and parental criticism ($F_{(3,56)} = 9.470, p = 0.029$).

4.5 Discussion

The first aim of this study was to identify whether the yips and LMS are associated with higher-levels of perfectionism, rumination, and reinvestment. The second aim was to quantify whether individuals experiencing the yips/LMS perceived their worst performance experience as more stressful than those in a control group. We expected the yips and LMS groups to report similarly high-levels of perfectionism, rumination, reinvestment, and subjective stress response, and that these scores would be consistently higher than both matched control groups.

The current results show that rumination, reinvestment, total perfectionism, and all aspects of perfectionism (with the exception of parental expectations) were greater in the yips group compared to the yips control group. In comparison to the LMS control group, the LMS group revealed greater levels of rumination, reinvestment, total perfectionism, and four aspects of perfectionism only: personal standards, organisation, concern over mistakes, and doubts about actions, with no difference on parental expectations, and parental criticism. Perhaps most importantly, there was no difference between the yips and LMS groups on any of the variables measured, supporting the suggestion that these disorders might be similar problems and therefore qualify for a more generic classification. Finally, both the yips and LMS groups scored higher on the IES than their respective control groups.

Previous research has suggested that the combination of harsh personal criticism, whilst striving for perfectionism, leads to underperformance (Stoeber & Otto, 2006). Although causality cannot be ascertained from the current study, a relationship was revealed between perfectionistic concern, perfectionistic striving, and the yips group. Previous research has also associated high levels of perfectionistic concern, and perfectionistic striving (i.e., unhealthy perfectionism; Stoeber & Otto,

2006) with pre-performance state and trait anxiety, and higher-levels of general anxiety in situations others typically find less stressful (Frost & DiBartolo, 2002). To our knowledge, the current study is the first to demonstrate higher levels of perfectionistic striving, and perfectionistic concern in LMS-suffers, thus extending findings previously reported for the yips (e.g., Roberts et al., 2013). This again serves to strengthen the notion that the yips and LMS are similar disorders.

Regarding parental expectations and parental criticism, no significant differences were found between the LMS group and the LMS control group, neither were any significant differences found in parental expectations between the yips group and their matched controls. Our findings suggest that these constructs of perfectionism might not be antecedents of the yips/LMS. Moreover, these findings lend further support to the idea that parental expectations and parental criticism might not be core components of perfectionism (Stoeber & Otto, 2006). One possible explanation for the current findings might be that striving to meet parental expectations and avoid parental criticism, regardless of whether the yips/LMS is experienced, is a common characteristic of an elite sport environment. Furthermore, parental expectation is commonly associated with the perception of needing to achieve unrealistically high-levels of success, facilitating a need for continuous self-evaluation of performance (Frost et al., 1990). Future research might consider whether they should be included in assessment of perfectionism in sport.

Although differences were found for most aspects of perfectionism between the yips/LMS groups, and their respective control groups, mean scores appear relatively low in comparison to previous research using the FMPS to assess perfectionistic tendencies in sport and mainstream psychology (see Table 4.1) (e.g., Sapieja, Dunn & Holt, 2011). One reason for this might be the use of a non-context

specific inventory to measure perfectionism. Indeed, mean scores generated using generic measures of perfectionism tend to be lower than with domain specific measures (e.g., Dunn, Gotwals & Causgrove Dunn, 2005). As such, reported levels of anxiety and obsessive thinking, might not be entirely reflective of individual perfectionistic tendencies in relation to the domain. However, we believe that the FMPS adequately met the purposes of the current study, assessing levels of perfectionism in relation to two problems underpinned by psychological components. Of particular interest was that the FMPS correlates highly with various psychological problems in which anxiety, and heightened emotional distress are core components (Antony, Purdon, Huta & Swinson, 1998; Saboonchi & Lundh, 2003). Furthermore, the FMPS has been used to assess the mediating effects of rumination on perfectionism in anxiety-related disorders (e.g., PTSD; Michael, Halligan, Clark & Ehlers, 2007), and in research linking depression and anxiety to stressful life-events (e.g., Dean, Range & Goggin, 1996).

Rumination scores were found to be significantly higher in the yips/LMS groups than in their respective matched control groups, suggesting that rumination is an important aspect of the experience of both the yips and LMS. This might, in part, explain the way in which the frequency and intensity of the yips and LMS tends to escalate. Specifically, rumination is thought to involve conscious thoughts, images and/or memories revolving around the causes, symptoms, and consequences of a significant emotional experience that recur without intention (Nolen-Hoeksema, 2000). Traditionally seen as a vulnerability factor of depression (Nolen-Hoeksema, Wisco & Lyubornirsky, 2008), rumination is typified by an increase in negative affect coupled with a decrease in positive affect, causing severity of anxiety-related symptoms and associated disorders to escalate (McLaughlin, Borkovec & Sibrava,

2007). It is thought that only a proportion of individuals who experience a single occurrence of a performance breakdown, characteristic of the yips/LMS, will subsequently suffer the debilitating longevity of the disorders (Roberts et al., 2013). However, for this proportion of individuals the escalating effect is frequently career destroying. Generally ruminators will appraise an event, and their ability to cope with that event as negative, as well as experiencing recurrent negative feelings, emotions, and behaviours associated with it. Furthermore, rumination has been linked to dispositional self-criticism, a predominant vulnerability factor in perfectionism (Masters, 1992). Research exploring rumination and perfectionism among sufferers of the anxiety-based disorder PTSD, has demonstrated that rumination mediates the relationship between perfectionism and PTSD, and potentially has a role in maintaining ensuing symptoms (Michael, Halligan, Clark & Ehlers, 2007). Whilst causality was not assessed in the current study, it might be that, in comparison to individuals who do not experience the yips/LMS, yips and LMS-sufferers might engage in ruminative thinking, dwelling on the negative aspects of a single experience in a repetitive uncontrolled manner, coupled with intense negative self-appraisal relating to inability to perform. Given the reported association between rumination, obsessional thinking, anxiety, and the yips/LMS (Roberts et al., 2013; Rotheram et al., 2007; 2012), one or more of these factors might also be associated with the way in which perfectionism relates to these disorders.

To our knowledge, this is the first study to demonstrate elevated levels of reinvestment in those that suffer with LMS, and adds to the growing literature reporting self-consciousness and reinvestment as components of the yips (Bawden & Maynard, 2001). Given the high-levels of reinvestment reported by both the yips and LMS groups, it might be that an individual's propensity to reinvest in their actions,

combined with perfectionistic tendencies, and prolonged ruminative thought processes, result in skill-based problems becoming ingrained. In contrast, it is feasible to suggest that someone without this profile might just pass off the initial experience as a one-off and be more able to keep things in perspective. However, the mechanism by which reinvestment, rumination, and perfectionism interact is unclear and future research should therefore address the causal relationship between perfectionism, rumination, reinvestment, and the yips/LMS.

The link between the experience of traumatic life-events and psychological disorders is by no means a new phenomenon (Zilberg, Weiss & Horowitz, 1982), and the current study suggests a similar link exists with the yips/LMS. To date, research has indicated that a range of factors related to a traumatic event (e.g., perceived threat), as well as personal factors (e.g., obsessive thought patterns) affect an individual's response (Zuckerman, 1999). Research has also found that individuals suffering from the yips report a history of significant life-events (Rotheram et al., 2007). Furthermore, individuals with high-levels of perfectionism are known to be more susceptible to the negative consequences of significant life-events (Hewitt, Flett & Ediger, 1996). This is the first study to report both unhealthy perfectionism, and high-level stress responses among the same group of individuals. Specifically, sufferers of the yips and LMS who have unhealthy profiles of perfectionism, appraise their worst performance experience as more stressful than non-perfectionist types. It is possible that the combination of these two components might be a precipitating factor in the development of the yips/LMS. However, due to the inclusion of other variables in this study, further research should be conducted to confirm this. Nonetheless, athletes meeting the criteria for unhealthy perfectionism, coupled with a high-

perceived stress response, should be supported to ensure effective processing of traumatic events (e.g., the yips/LMS).

4.6 Summary and Concluding Remarks

The purpose of study two was to explore the personality characteristics of individuals suffering from two of the most debilitating performance problems in sport known as the yips and LMS. The adoption of psychometric measures enabled quantification of perfectionism, rumination, and reinvestment among yips and LMS sufferers. In addition to these characteristics, subjective stress response to worst performance experience was also measured. Findings from this study demonstrate that levels of perfectionism, rumination, and reinvestment are greater in individuals experiencing the yips and LMS, than in matched control groups. Furthermore, those suffering from the yips/LMS reported higher levels of stress in response to their worst performance experience, than their non-suffering counterparts. Whilst the study design prevents us from being able to determine causality, we favour the explanation that perfectionism, rumination, and reinvestment increase the likelihood of experiencing the yips/LMS. These findings are consistent with study one of this thesis, demonstrating that the yips and LMS are similar problems, and therefore supports our previous recommendation for using a generic classification (i.e., performance blocks) for the yips and LMS that considers the individual's experience, irrespective of sport.

Consistent with study one, similarities were found between personality characteristics associated with the yips and LMS, and those associated with anxiety-related disorders, supporting our recommendation that the yips and LMS might be equivalent forms of an anxiety-based disorder, at the very least closely related. From a practical perspective, these findings have implications for sport psychologists working

with athletes in elite sport. For example, assessing perfectionistic tendencies, ruminative responses, and reinvestment, might help to identify those athletes most vulnerable to developing the yips/LMS, so that interventions can be targeted accordingly.

4.7 Future Research Directions

Based on the psychological architecture of these problems outlined in studies one and two, several areas warrant further investigation. Specifically, research is called for to test and monitor the effectiveness of interventions focussed specifically on the predominant psychological components involved; namely anxiety, loss of control, fear, and the occurrence of significant life-events. Thus, the final phase of this research will look to explore the role of treating psychological components of the yips and LMS, and significant life-events that occurred prior to development of the problem, and how this impacts on performance. In light of the similarities that have emerged between the components associated with the yips, LMS, and anxiety-based disorders, study three will explore current methods currently used to treat anxiety-based problems outside of sport, as they might offer equivalent success.

5.0 Study Three

Treatment of the yips and LMS: The use of Eye Movement Desensitisation and Reprocessing with Exposure

5.1 Introduction

Studies one and two of this thesis explored the psychological components and personality characteristics associated with the yips and LMS, two common performance problems that cause momentary loss of movement control. Findings suggest that the yips and LMS, irrespective of the sports in which they are reported, are psychological problems underpinned by equivalent emotional and cognitive components that manifest in physical symptoms of locked, stuck, and frozen movements.

The findings of study one indicated that high arousal, fear, anxiety, panic, frustration, intrusive negative thoughts, and loss of conscious (deliberate) thought control were all key elements of both the yips and LMS. The most consistently reported component being the heightened level of anxiety perceived to be inescapable. It also emerged that affected individuals engaged in self-critical thinking, avoidance behaviour, and obsessiveness both in the affected environment and socially. In several instances, bouts of depression were also reported. Study two built on these findings to demonstrate a link between the experience of the yips and LMS, and increased levels of perfectionism, rumination, and reinvestment. It also emerged that individuals suffering from the yips and LMS experienced higher levels of subjective stress in relation to poor performance (equated to mild trauma experience) than non-affected controls.

The findings of study one and two are consistent with current anxiety-based disorder research. Firstly, individuals with anxiety-based disorders experience persistent cognitive, and/or somatic anxiety, coupled with intrusive negative thoughts, hypersensitivity, frustration, and avoidance behaviour (APA, 2013). Secondly, a substantial amount of research has demonstrated higher levels of perfectionism, rumination, and reinvestment in individuals suffering anxiety-based disorders (Egan, Hattaway & Kane, 2013). Physical characteristics of the yips and LMS include muscle tension, spasms, shaking, and involuntary body positions. Individuals suffering from movement-based anxiety disorders (e.g., dystonia) are also said to experience these physical symptoms (Pont-Sunyer, Marti & Tolosa, 2010).

As identified in Chapter three, it has been suggested that significant life-events can lead to the development of the yips (e.g., Rotheram et al., 2012). Similar findings have been reported in research of anxiety-based disorders, where the experience of significant life-events/trauma has consistently been associated with onset and development (Mineka & Oehlberg, 2008; Thomas et al., 2006; Schweinfurth et al., 2002). Furthermore, research exploring LMS, has suggested that the disorder is related to traumatic sporting experiences, and that LMS itself is traumatic (e.g., Day et al., 2006). Findings from study two appear to support this, demonstrating that individuals suffering from the yips and LMS experienced a high-level stress response comparable to mild trauma.

Psychologists have faced major difficulties appropriately diagnosing the yips and LMS, traditionally adopting criterion based on self-report, and/or observation of physical movement disruption in the form of twisting, muscle tension, and spasms causing loss of ability to execute the skill (e.g., Day et al., 2006; Smith et al., 2000; 2003). As such, the majority of treatment methods have focused on the physical

symptoms, using cognitive behavioural methods and/or technical modifications (e.g., putting one handed, breaking down the skill chain; Day et al., 2006; Philippen et al., 2014). Importantly, study one highlighted the lack of success achieved through cognitive therapy alone in treating both the yips and LMS. If, as studies one and two suggest, the yips and LMS are underpinned by subconscious psychological components, it is perhaps not surprising that addressing physical symptoms, and deliberate, higher-order cognitive processes, rather than internal subconscious diatheses have offered limited to no success (e.g., Philippen et al., 2014). Alternative methods need to be identified that address the subconscious components evidently involved. Considering the similarities between the yips, LMS, and other anxiety-based disorders, it is feasible to suggest that current treatment methods for anxiety-disorders might be equally effective for the yips and LMS.

5.2 Review of Literature

5.2.1 Aetiology of anxiety-based disorders.

It is predicted that anxiety disorders develop not just from anxiety, but from fear, and more specifically associative fear learning whereby fear is generalised to other contexts/situations in the absence of an actual threat (Kindt, 2014; LeDoux, 2014). Fear is said to be the fundamental emotion involved in initiating our hardwired fight-or-flight response in the event of real/perceived threat (Barlow, 2002).

Rachmann (1977) suggested that fear and anxiety can be initiated via direct exposure to real/perceived threat (i.e., experiencing a traumatic event), negative reinforcement of survival through escape/avoidance, vicarious experience, and/or exposure to information relating to threat.

The relationship between fear, anxiety, and the development of anxiety-disorders is thought to comprise of three interacting domains: behavioural, cognitive, and physiological (LeDoux, 2006; Sylvers, Lilienfeld & LaPrairie, 2011). Functions of the behavioural domain include initiation of escape or avoidance responses that either terminate or prevent aversive events (e.g., fight-flight response). The second domain consists of cognitive processes, and involves perception and interpretation of presenting stimuli for the process of memory formation (Lang, 1979). In the third domain, physiological processes involve often-unconditioned reflexive responses that are learned either through direct or vicarious exposure to negative information (e.g., muscle tension, shaking, increased heart-rate; Rachman, 1977). To permit for a fast effective reaction to the countless potentially threatening stimuli, the fear response is initiated by cognitive structures outside of our awareness (Ohman & Mineka, 2001). While this allows for highly efficient behavioural responses in the event of real threat, maladaptive responses can also be initiated when harmless stimuli are inappropriately interpreted (Lissek et al., 2014). For example, this might result in initiation of fight/flight in the form of physical freezing, avoidance, or escape, in response to performance failure, embarrassment, or memory recall (e.g., recall of significant/upsetting life-experience in present context).

Research supports that significant experiences throughout life that are perceived as threatening, uncontrollable, and/unpredictable (e.g., involving perceived threat to the self in relation to context) can be classified as traumatic, causing overwhelming levels of fear and anxiety, and could lead to the development of an anxiety-based disorder (Mineka & Oehlberg, 2008; Mineka & Zinbarg, 2006; Seligman & Binik, 1977). According to criteria set out in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-V*; APA, 2013), traumatic

events are defined as any experience perceived by an individual as emotionally overwhelming. With trauma survivors representing 80% of clients receiving mental health care (Breslau & Kessler, 2001), there has been much debate regarding the different severities of experience required for the development of a disorder (Nemeroff et al., 2013). In an attempt to more clearly distinguish between trauma severities, Shapiro (1999), put forward two different categories designated *small t*, and *Big T* traumas. In this distinction, Big T traumas comprise events such as rape, war, and those involving physical harm and/threat to life. Small t traumas on the other hand include events more likely experienced in every day life such as failure, the death of a loved one, bullying, loss of a job, or moving house, and are linked to feelings of embarrassment, shame, guilt and sadness (Shapiro, 1999). Importantly, the term small t trauma does not imply insignificance of the event in relation to Big T traumas, and to the individual experiencing the event the emotional intensity can be just as severe. Whilst this distinction supports the assessment of trauma severity for the prescription of efficacious treatment interventions (Parker & Henfield, 2012), research is yet to determine whether one is more or less predictive of anxiety-based disorders (Shapiro, 2001).

The standard definition of trauma experience recognises that individuals do not experience different events with the same level of emotional intensity, and that it is the individuals subjective emotional experience of an event that determines whether it is traumatic, not the objective facts of the events itself (5th ed.; *DSM-V*; APA, 2013). Therefore, a single unpredictable or uncontrollable event perceived as threatening by one individual can be traumatic, and potentially lead to the development of an anxiety-based disorder (e.g., *post-traumatic stress disorder* [PTSD]; Foa, Zinbarg & Rothbaum, 1992), whereas in others it might not. Study two of this thesis supports

that individuals affected by the yips and LMS have higher levels of perfectionism, rumination, and reinvestment in comparison to controls. Furthermore, it was demonstrated that the same individuals perceived their worst performance as comparably more stressful than controls. Thus, it might be that these individuals were more susceptible to perceived threat, and therefore trauma experience, consequently increasing their vulnerability to the yips/LMS. Indeed, it is important to consider personality differences, individual cognitive processes, emotion, and previous experiential differences, in relation to trauma experience, and furthermore the development of anxiety-based disorders (Scaer, 2014).

5.2.1.1 The impact of significant life-events and trauma.

To understand the relevance of trauma experience, and significant life-events in the development of anxiety-based disorders, researchers have studied the mechanisms involved in the creation and storage of memory (Stokes, 2009). In essence, exploring what happens in the brain when fear and anxiety are initiated. Studies of trauma memories have consistently identified the role of the amygdala in relation to fear and anxiety (LeDoux, 2006). Indeed, the amygdala has a huge responsibility with regards to the emotional content of painful memories, playing a central role within the limbic system, a much larger brain network involved in processing emotion attached to painful experiences (Stokes, 2009).

In the event of perceived threat, the amygdala initiates fear, and accelerates arousal. Immediate effects of arousal include increased alertness and focus, enhanced short-term memory storage, increased muscle tone, dilated pupils, and an expanded field of vision (LeDoux, 2006). In essence, the amygdala initiates the body's preparation for the high-level neuromuscular activity required to respond to threat (e.g., fight-flight response). Survival takes precedent over more primitive reactions,

and so we are minimally aware of this process occurring until we experience the emotional symptoms, typically in the form of intense fear and anxiety. Rather than overriding this instinctive response with rational thought, judgement, and decision-making appropriate for the context, the conscious, information-processing areas of the brain are momentarily inhibited by the flood of hormones into the blood stream, and subsequently rendered powerless to intervene (Stokes, 2009).

For every experience, an associated memory is physically stored within brain networks that form our unconscious mind, distinct from executive, conscious brain regions that allow for effective decision-making, planning, and rational thought (Scaer, 2014). Although we are often unaware of their impact, these networks and memories determine our interpretation of the world, and therefore how we think, feel, and behave at any given time; both positive, and negative (Levine, 1997). As our ability to rationally interpret threatening situations is temporarily inhibited by an overwhelming flood of emotion at the time of the event, the associated memory is stored in real-time with all the emotional intensity of the initial experience (Ehlers & Clark, 2000). Once created, all that is required for a memory to be recalled are one or more stimuli that are subconsciously associated with the initial event (Shapiro, 2012). Thus, memories of significant/traumatic events are often recalled inappropriately in response to vaguely connected internal/external signals (e.g., similar smell, sound, sight to the original event). These memories will continue to be recalled in response to present day stimuli until they are accessed, and appropriately processed in a safe therapeutic environment where the individual is able to rationally work through the event, diffuse the emotional pain associated with it, and recognise it as a past experience, therefore allowing it to be appropriately stored (Levine, 1997).

The long-term effect of trauma experience varies in severity, and the extent to which it disrupts behaviour. However, in the majority of cases the consistently pervasive theme is anxiety (Mineka & Oehlberg, 2008). Additional symptoms include frustration, aggression, panic, and avoidance (APA, 2013), all key components of the yips and LMS. Thus, it is possible that previous life-experience/early trauma might underpin the yips/LMS, and that sport might provide the necessary environmental stimuli to trigger a threat response in the form of the physical symptoms we observe as the yips/LMS. If this is the case, identifying and appropriately processing these memories might prevent further harmful effects.

5.2.2 Treatment methods for anxiety-based disorders.

Consistent with Rachmann's (1977) suggestion of four pathways leading to the acquisition of fear and anxiety (i.e., direct exposure to real/perceived threat, negative reinforcement of survival, vicarious experience, and information relating to threat), treatment methods have been developed that focus on increasing predictability and therefore control over a given situation, reinterpreting the content and organisation of the subjective experience for the client (Lohr, Lilienfeld & Rosen, 2012). These primarily include cognitive methods such as relaxation training, imagery, positive self-talk, and exposure (e.g., Barlow, Craske & O'Leary, 1992; Craske & Barlow, 2006). Despite the long-standing use of these therapies for the treatment of anxiety-based disorders, they have not been without criticism. For example, they require vast amounts of time and homework, and often produce little effect, with problems frequently returning (Ho & Lee, 2012; Kabat-Zinn, 2013). Indeed, by the very nature that it elicits such a response, real/perceived threat is not something that can be predicted or controlled, and therefore individuals suffering

from anxiety-based disorders are frequently prone to relapse in the long-term (Lohr, Lilienfeld & Rosen, 2012).

Considering the aggressive nature with which anxiety prevails, and the subconscious impact of significant life-events, it is not surprising that addressing conscious level processes alone has challenged treatment success. Consequently, a new wave of therapies has been developed that specifically address the symptoms of anxiety, and the subconscious areas of the brain involved in memory storage and retrieval (Grand, 1999; Levine, 1997; Shapiro, 1999). These therapies are positively regarded for their relative efficiency and speed in producing dramatic results in a comparably short amount of time compared with conventional techniques, such as counselling, CBT, or psychodynamic processing (Wells, Polgase, Andrews, Carrington & Baker, 2003).

5.2.2.1 Emotional Freedom Technique (EFT; Craig, 1995).

EFT is a brief exposure therapy founded by ordained minister Gary Craig. EFT assumes that unresolved emotional pain, and significant life-events/trauma can block the body's energy meridians and cause ill health (Craig, 1995). EFT is considered to work in the same energy meridian system on which acupuncture is based, a treatment widely recognised for the relief of physiological conditions, and an effective means of inducing feelings of calm and serenity (Craig, 1995; Levine, Gormley & Fields, 1976). As such, acupuncture has been prescribed as either a sedative, or anxiety-relieving instrument according to the length of time the needles remain in place (Apostolopoulos & Karavi, 1996). Evidence suggesting marked differences between acupuncture points and non-acupuncture points with regards to electrical resistance of the skin (Cho, 1998; Cho & Chung, 1994), is consistent with the notion that meridian-based therapies derive their properties from the stimulation

of specific meridian points (Gallo, 1999). Due to the evasive nature of acupuncture, and the level of expertise required to administer the technique, it does not lend itself readily to the treatment of emotional disorders. EFT however offers a non-evasive meridian-based therapy for the relief of these problems (Wells et al., 2003).

EFT is said to be extremely effective for the treatment of psychological problems that manifest in physical form (www.emofree.com). Incorporating the human electromagnetic energy system as an intervention point on the emotional and cognitive systems (Feinstein, 2008), EFT adopts a single all-encompassing algorithm for the treatment of any emotional problem, and does not require the use of complex diagnostic procedures (Crag, 1995). As such, it is easy to administer, and does not necessarily require the support of a therapist (Craig, 1995). The basic treatment protocol followed in EFT consist of the client tapping through a series of acupuncture points, while verbally tuning into the problem emotion (e.g., “this negative emotion,” “this anxiety” etc.) One round of EFT consists of tapping a minimum of seven times in sequence through the 12 traditional acupuncture points (five on the head, two on the upper trunk, and five on the hand). A statement of self-acceptance and/safety is combined with this process (e.g., “I truly and deeply accept myself”), verbalised prior to each set of tapping. *Subjective units of distress* scores (SUDs; Wolpe, 1973) are recorded prior too, and on completion of each sequence of tapping (Craig, 1995), and treatment continues until the problem emotion is effectively alleviated.

Despite anecdotal evidence which suggests EFT can be effective for the treatment of psychological conditions such as PTSD (Church et al., 2013), fear, phobia (Salas, Brooks & Rowe, 2011), and anxiety (Craig, 1995), there have only been a few studies exploring its clinical potential, findings from which are not generalizable due to small sample size and failure to use appropriate control

comparison groups (e.g., Swingle 2001). More recently, there has been an increase in research exploring the use of EFT for the treatment of emotional disorders. For example, Wells et al. (2003) examined the effectiveness of EFT compared with diaphragmatic breathing (DB) for the treatment of specific animal phobia. Dependant measures included a Behavioural Approach Task designed to assess the level of avoidance towards the feared animal, and a modified version of the Brief Standard Self-Rating for Phobic Patients (Marks & Matthews, 1979) to measure change in phobic symptoms. In addition to these, pulse rate, and SUDs were recorded as a measure of discomfort experienced when imaging the feared animal. Participants were randomly assigned to receive 30 minutes of EFT ($n = 19$), or DB ($n = 17$). Findings from this study demonstrated that EFT produced significantly more improvement than DB on four of the five measures employed. It was however suggested that these effects might be due to placebo effect or regression to the mean (Wells et al., 2003).

A more recent study looked at the use of EFT for trauma-based problems (Flint, Lammers & Mitnick, 2006). In the first of two separate case studies, the therapist conducted a critical incident stress debriefing (CISD) for 35 members of an organisation, following the death of one of their colleagues. During this debrief the therapist recommended that if any of the individuals were still experiencing emotional distress, EFT could provide a quick means of relaxation, diminishing the intensity of their emotional pain. As a result of the CISD, six participants requested EFT, and reported effective relief of symptoms as a result of treatment. Specifically, participants receiving EFT treatment reported intense emotional distress prior to EFT, and SUDs between two and zero following treatment. These authors concluded that EFT offered an effective treatment for eliminating traumatic memories following

CISD (Flint, Lammers & Mitnick, 2006). In the second case study of this investigation, the second author administered EFT to a single client experiencing emotional distress following an accident that occurred while on a moving train. After receiving EFT to process the memory of the event, the client's SUD score dropped from eight to zero, and feelings of guilt and helplessness were considerably reduced. The two cases reported here provide tentative evidence for the efficacy of EFT, with the use of SUDS as the only dependant measure being susceptible to participant bias (Flint, Lammers & Mitnick, 2006).

EFT has also been used as an effective treatment method to improve free throwing in a group of 26 college basketball players, based on the assumption that EFT can effectively reduce performance anxiety (Church, 2009). In this study, Church (2009) reported significant improvement in free-throw performance following 15 minutes of EFT administered during a simulated game situation. It was suggested that EFT alleviated levels of anxiety experienced during competition, and therefore led to improved performance of a free throw task (Church, 2009). Again, this research should be interpreted with caution, and offers little in terms of hard evidence, with a lack of reliable dependant measures. However, taken tentatively, this study does imply that EFT might effectively treat performance anxiety.

As previously identified in chapter two of this thesis, to our knowledge, only one published study has reported using EFT to treat the yips (Rotheram et al., 2012). In a single case-study report, Rotheram and colleagues (2012) demonstrated relief of the yips symptoms following four, two hour long sessions of EFT, during which the participant was required to tap each meridian point whilst simultaneously accessing a painful memory associated with their first yips experience, repeating a phrase such as "this anxiety." This event was identified during a pre-treatment interview, in which

the participant was required to describe his experience of the yips, and recall any significantly emotional events that might be related to the problem (Rotheram et al., 2012). These authors predicted that physical symptoms of the yips would subside as a result of addressing the painful emotions associated with significant life-events attached to the problem. Visual inspection, kinematic movement assessment, and performance outcome data revealed improved performance in skill execution (putting stroke), and reduced anxiety associated with the skill measured using SUD scores (Wolpe, 1973). This case is noteworthy as it provides initial evidence to suggest that addressing memories attached to significant life-events associated with the yips offers relief from the maladaptive physical symptoms. The single case-study design, and comparable lack of a research evidence base for EFT requires us to interpret these findings with caution, however, initial evidence for the use of energy therapies to treat the yips would seem promising.

5.2.2.2 Brainspotting (Grand, 1999).

Guided by training in EMDR, psychoanalysis, and somatic experiencing, Grand (1999) developed brainspotting. Brainspotting is based on the premise that “where you look affects how you feel” (Grand, 1999, p3) – i.e., your feelings will fluctuate depending on whether you look to the left or to the right. Signals from the eyes are usually processed and stored in appropriate areas of the brain. However (as previously highlighted) extreme levels of emotion can overwhelm effective processing, causing memories to be stored in their raw emotional state. Brainspotting uses our field of vision to internally scan memory networks, and locate traumatic memories. Using hand movements, the practitioner guides the client’s gaze from left to right in a series of eye movements, whilst simultaneously having a focussed awareness of a particular issue (e.g., thoughts/body sensations/images/emotions

associated with a traumatic event). Automatic reflexes of the eyes and/or face signal the identification of a trauma memory, or 'brainspot'. At this point, the practitioner holds the clients gaze and processing begins. Keeping a focussed gaze on one spot is thought to fix attention in the brain on the specific internal location of a trauma memory, and promote the deep processing that leads to its effective resolution. Despite some reported success (e.g., Grand, 1999), this method has not been exposed to sufficient scientific scrutiny, and so there remains much scepticism from the academic community regarding its application.

5.2.2.3 Eye Movement Desensitisation and Reprocessing (EMDR; Shapiro, 1999).

EMDR is a psychotherapeutic approach originally developed for the treatment of emotional pain (Shapiro, 1999). Multiple randomised trials have confirmed it's efficacy, and EMDR has been formerly recognised by a wide range of clinical organisations including the American Psychiatric Association (APA; 2013), the UK National Institute for Clinical Excellence (NICE; 2005), and the World Health Organisation (WHO; 2013). Since its initial application as a treatment therapy for *post-traumatic stress disorder* (PTSD), EMDR has been successfully used to treat a variety of anxiety-related disorders including *generalised anxiety disorder* (de Jongh & Broeke; 2009; Gauvreau & Bouchard, 2008), *major depressive disorder* (Grey, 2011), and *obsessive compulsive disorder* (OCD; Marr, 2012).

EMDR consists of an integrative, eight-stage treatment protocol: 1) case formulation and history taking, 2) client preparation for treatment (e.g., identification of a safe-place and introduction to reprocessing procedure), 3) assessment of emotional distress and identification of negative beliefs, 4) reprocessing of target memories, 5) desensitisation, 5) installation of positive cognition, 6) body scan for

remaining emotional distress, 7) individual session closure, and 8) re-evaluation of symptoms at the start of each new session. This protocol is grounded in Shapiro's (2001) *adaptive information-processing* (AIP) model, thus, adopts the assumption that dysfunctionally stored memories (e.g., memories attached to significant life-events, or traumatic experiences) are not adequately processed, but instead stored in real-time prior to adaptive resolution. Subsequently, they manifest in somatic (e.g., shaking, muscle tension), affective (e.g., fear, panic), cognitive (e.g., intrusive thoughts, rumination), and perceptual symptoms (e.g., flash-backs, blurred vision) (Solomon & Shapiro, 2008). When these memories are created in early childhood, they can cause negative self-evaluations, beliefs, and conclusions that manifest in maladaptive behavioural patterns throughout the life-course (Stewart-Grey, 2008). The aim of EMDR is to process memories attached to significant life-events that cause psychological, emotional and/or behavioural problems, resulting in transformation and resolution of maladaptive symptoms. It is believed that by using *bilateral stimulation* (BLS) to facilitate directed dual attention (recalling the trauma whilst remaining present and grounded in a safe-environment), the brain can access the dysfunctionally stored experiences, stimulate the innate processing system, and consequently transform the memory to an adaptive resolution (Shapiro, 1999). Unlike traditional cognitive therapies that deliberately challenge, restructure, and then reframe negative beliefs, EMDR enables spontaneous shifting of negative beliefs during subsequent processing (Oren & Solomon, 2012). Once the memory has been adequately processed, the essential information is assimilated, and new information is appropriately stored in memory without the disturbing emotional and physical sensations that were originally attached to it.

The first line treatment recommended for anxiety-based disorders (APA, 2013; NICE, 2005) involves a combination of EMDR (Shapiro, 1999), and trauma-focussed cognitive behavioural therapy (TF-CBT; APA, 2013; Bisson & Andrew, 2005; NICE, 2005).

5.2.2.4 Trauma-Focussed Cognitive Behavioural Therapy (TF-CBT; National Institute for Clinical Evidence, [NCCMH] guidelines, 2005).

TF-CBT is based on the premise that individual's who have symptoms of an acute anxiety disorder as a result of a traumatic experience, also have unhelpful thoughts and beliefs specifically related to the event. Consequences of these thoughts and beliefs include avoidance behaviour, and a persistent sense of current threat (e.g., hypervigilance). TF-CBT generally includes exposure treatment, and aims to reduce avoidance through repeated exposure to the threatening cue, whilst challenging unhelpful/harmful thoughts/beliefs associated with the stimuli (Craske, Treanor, Conway, Zbozinek & Vervliet, 2014). In essence, exposure treatment works on the premise that repeated re-exposure to anxiety inducing stimuli effectively reduces a learned fear response by creating new, more appropriate responses to threatening stimuli (Kindt, 2014).

In planning exposure treatment, the therapist guides the client through the identification of increasingly intense anxiety-evoking situations. Situations identified gradually escalate from $0/10$, to $10/10$ in severity according to SUD score. One of the requirements of exposure treatment is that the client engages in daily homework of each of the identified situations to facilitate mastery and practice effects. As such, it is recommended that treatment be supported on a weekly basis to accommodate prescribed practice (Grey, 2011).

Meta-analyses suggest that EMDR and TF-CBT (exposure) are equally effective for the treatment of anxiety-based disorders (Davidson & Parker, 2001; Rothbaum, Astin & Marsteller, 2005; van Etten & Taylor, 1998). Similarities between the two methods include imagery (mental rehearsal of coping responses to future stressors), a cognitive component, and exposure (Lohr, Lilienfeld & Rosen, 2012). However, exposure treatment does not address existing memories associated with stimuli that continue to impact on behaviour (LeDoux, 1995). This is contradictive of the emerging belief that the underlying mechanisms and processes associated with anxiety-disorders ought to be addressed for treatment effects to be permanent (Scaer, 2014). Indeed, exposure therapy alone produces symptom relief only in the context in which it is practiced, and therefore unpredictable aversive events could continue to trigger the original source of maladaptive behaviour (i.e., emotion memory; Quirk, 2002). Thus, an additional form of therapy is necessary if the underlying cause of a maladaptive response is to be erased.

5.2.3 Section summary.

The findings of studies one and two have identified several psychological components of the yips and LMS (i.e., anxiety, fear, intrusive thoughts, loss of control, perfectionism, rumination). Furthermore, research has demonstrated a link between significant life-events, trauma, and the yips and LMS (e.g., Rotheram et al., 2007). Taken collectively, the current review of literature and the findings already obtained in this thesis, highlight several similarities between components of the yips and LMS, and those associated with anxiety-based disorders. Consequently, (and given the lack of success using traditional cognitive/conscious interventions (Ho & Lee, 2012; Kabat-Zinn, 2013), it suggests that a therapeutic intervention that has

proven so effective in treating disorders underpinned by anxiety, and related to trauma experience, could hold equal promise for the yips and LMS in sport.

5.3 Aims of Study Three

In accordance with the recommendations of APA (2013), and NICE (2005), the primary aim of the third study is to explore the effectiveness of a combined intervention of EMDR and exposure therapy in treating the psychological components of the yips and LMS. Due to the lack of existing research using this method for the yips and LMS, a second aim is to comprehend the athletes' experiences of receiving EMDR. It is hoped that findings from this study will advance our knowledge of effective treatment methods for the yips and LMS.

5.4 Design

This study used a mixed methods approach of qualitative and quantitative data collection to assess the effectiveness of an intervention using EMDR treatment with exposure therapy to treat the yips and LMS. This was with the understanding that such a triangulated approach can contribute to the literature in several ways. First, a quantitative case study can provide a preliminary investigation of a hypothesis, thus evaluating the potential need for further research (Creswell, Plano Clark, Gutmann & Hanson, 2003). Second, the results of statistical data can inform clinical practice by providing some empirical support to guide more effective treatment (Mertens, 2014). Third, the case-study evaluation of two individual cases can provide in-depth understanding of the individual's phenomenological experience within the boundaries and limitations of the said design. Furthermore, validation of EMDR is currently based upon populations outside of elite sport, and so it was hoped that findings would provide valuable evidence for its suitability in the context of sport.

5.4.1 Participants.

Following institutional ethics approval,¹¹ two athletes were identified as suitable for inclusion in the study. To ensure the highest level of confidentiality, the individual athletes in this study will be referred to throughout as “Athlete A”, and “Athlete B”. Athlete A was identified as experiencing LMS, and was referred by a sport psychologist who had been working with the athlete for several years. Athlete B approached the primary researcher, presenting all of the criteria for the yips. Following their initial identification/referral, each athlete was provided with information pertaining to the study purpose and requirements of their involvement should they wish to take part. Once their interest in participating had been established, their suitability for the study was confirmed by self-report, and professional observation by a coach. The yips and LMS were assessed according to criteria outlined in Chapter 3.3.1 of this theses, as used in studies one and two, and adhered to in previous research (e.g., Day et al., 2006; Rotheram et al., 2007; Smith et al., 2000; Tenn, 1995a). Participants were required to meet all of the relevant criteria. Additional criteria required participants to be over the age of 18 years, currently experiencing the problem (for a minimum of three months), and not currently undergoing any other form of treatment directly relating to the problem (physical or psychological).

As per the recommendations of Foa and Meadows (1998), two different therapists delivered the EMDR component of each intervention, and two different sport psychologists delivered exposure treatment, and also facilitated communication between coach/athlete/therapist throughout.

¹¹ Ethical clearance for study three was applied for and approved by the Sheffield Hallam Ethics committee (see Appendix 11).

5.4.2 EMDR protocol.

The eight-stage protocol of EMDR begins with a comprehensive case formulation, client evaluation, and history taking to identify unprocessed traumatic, and/or other significant experiences that continue to drive psychological disturbance. Specifically, the therapist guides the client through in-depth exploration of the current problem, associated behaviours, emotions and symptoms, and remembered events that might have caused the problem. Based on this information the therapist develops a treatment plan that identifies the specific memories on which EMDR will focus. These target memories (TMs) might include unprocessed memories of trauma experience (designated as large T by Shapiro, 2001), as well as other significant life-events, and/present distressing situations (designated small t; Shapiro, 2001). An important feature of EMDR is that the client is not required to discuss significant life-events in great detail in order for them to be identified.

Stage two consists of an extensive preparation phase during which the client is provided with the necessary resources to manage the processing of their distressing memories (e.g., relaxation techniques). One of the primary goals of this stage is to ensure rapport and trust is established between the client and therapist (Fernandez & Faretta; 2007), and for the client to identify an appropriate safe-place memory to access at the end of each session (Shapiro, 2007). In addition to being a fundamental requirement of any effective therapist-client relationship, this also ensures that the client feels able to report an accurate account of thoughts, feelings and behaviours associated with disturbing memories. Furthermore, in EMDR the therapist needs to be able to read the clients current state to know when to pursue, or pause processing at any point. Stage three involves accessing the clients TM, and associated perceptual, cognitive, affective, and somatic components of that memory, so that it can be

effectively processed. Specifically, the client identifies the particular aspects of the TM to be processed, by asking the client to select a best representation of the memory. The client then identifies a negative self-belief attached to the memory (e.g., I am helpless). The client is asked to verbalise a preferred positive cognition, and rate their level of belief in that cognition, using the *validity of cognition* (VOC) scale, where 1 = *not true*, and 7 = *completely true* (Shapiro, 2001). The client is also asked to provide a SUD score to indicate their level of emotional disturbance, where 0 = *no disturbance*, and 10 = *worst possible disturbance*. Stages one to three set the foundations for the treatment protocol to be effective, and a structure on which the client and therapist can monitor progress. Thus, whilst eye movements are an important part of the process, they are ineffective without comprehensive groundwork (Shapiro, 1999).

Stage four addresses the client's responses to the TM, including the identification of other associated memories, insights, thoughts, or feelings that arise. Specifically, the client is asked to focus on the worst aspect of their TM, while simultaneously engaging in therapist-directed eye movements as a form of BLS. Each set lasts approximately 30 seconds, with lengthier sets during abreactions. After each set, the client reports any elicited material (e.g., cognition, image, feeling, emotion), which is subsequently processed using further BLS, until the SUD score associated with the TM is lowered. This process essentially desensitises the client to the memory, allowing them to reprocess it and attach more adaptive cognitions. Stage five focuses on attaching a positive cognition to the TM, and repeating BLS until the client's belief in the positive cognition is at least $\frac{7}{10}$ VoC. In Stage six, the client is asked to report any remaining bodily sensations that are experienced when thinking back to the original TM. If any sensations are still present, they are targeted until the

client reports that the body is free of disturbance, at which point the session is appropriately closed (stage seven). If the processing is incomplete in a single session the therapist will support the client in using various techniques to establish a sense of calm. Before leaving the session the client is briefed on further processing that might continue between sessions as a natural consequence, and the use of a journal to record any experiences they might have. At the start of every new session the therapist must satisfy stage eight of the protocol. This involves re-evaluating client progress, sense checking positive results from the previous session have been maintained, and identifying any need for further processing. Following this the therapist then continues reprocessing the next identified TM. In addition to reprocessing traumatic experiences from the past, EMDR requires the identification of current anxieties and triggers to problematic behaviours. This facilitates connection between past experience and current behaviour through which further healing can take place. This final phase is an essential part of determining treatment success.

5.4.3 Pre- and post-intervention performance measures.

This single subject case study design consisted of base line measurement, EMDR treatment and exposure therapy, interspersed with several quantitative data collections in the form of performance outcome.

5.4.3.1 Prevalence of LMS.

Prevalence of LMS was measured by visual inspection and self-report pre, mid, and post intervention, by both the athlete and coach. In addition to this, performance scores from competitions attended before and after the intervention period were reported.

5.4.3.2 Prevalence of the yips.

Consistent with previous research (e.g., Marquardt, 2009; Rotheram et al., 2012), pre- and post- intervention prevalence of the yips was assessed using visual inspection (where 0 = no yips, and 1 = yips), and kinematic data. Specifically, Athlete B was required to perform ten putts on a level putting green to each of two target holes at 0.91m (3 feet), and 1.22m (4 feet) distances. Distances were identified according to the athlete's most anxiety-inducing situation associated with the yips. Specifically, the athlete identified experiencing most fear and anxiety at 3, and 4 foot putting distances. Three dimensional kinematic data were captured using an electromagnetic sensor positioned 2.5 cm below the base of the putter grip (Polhemus Liberty, Polhemus Inc, Colchester, VT). Data were sampled at 240Hz and captured using Golf Biodynamics Ultimate system software (Version 11.0.5, GBD Pty, Australia). As per manufacturer's instructions, an electromagnetic pointer was used to digitise virtual markers used to define the target line. A local coordinate system for the putter was aligned such that the x-axis was coincident with the target line (positive direction away from the hole); y-axis was perpendicular to the target line (positive direction anterior to the participant); z-axis vertically upwards.

The key kinematic variables derived from biomechanical analysis included putter face rotation angle and putter face rotation angular velocity. These data were exported from the data capture software using customised Matlab script (The Mathworks Inc, Natick) and graphed in Microsoft Excel software (Microsoft Corp, 2010).

5.4.3.3 Subjective Units of Distress (SUD) scores.

SUD scores were recorded throughout both EMDR and exposure treatment processes. The aim of this was to identify each athlete's respective level of anxiety in

association with the problem. This also provided a means of monitoring the success of each processing session where the aim was to reduce SUD scores to less than three (Shapiro, 1999).

5.4.3.4 Impact of Event Scale (IES; Zilberg, Weiss & Horowitz, 1982).

The second case study of this report¹² also adopted the IES as a measure of anxiety (see section 4.3.3.4 for full details of this measure). This was consistent with study two of this thesis, and deemed an effective additional measure of anxiety response to the EMDR treatment. Specifically, Athlete B completed the measure pre- and post-intervention, responding to each statement indicating the level of distress experienced in relation to the yips. Distress level was reported using a scale of zero (*not at all*) to four (*extremely*), with a total range of 0-88. Intrusive responses were measured by items such as “I thought about it when I didn’t mean to,” avoidance was measured by items such as, “I stayed away from reminders about it,” and physiological arousal was measured by items such as “my feelings about it were kind of numb”.

5.4.3.5 Social validation.

Consistent with the empowering philosophy of PCT (Kelly, 1995), feedback from the athlete regarding intervention satisfaction is fundamental. In a sporting context, social validation interviews have been conducted to gain more in-depth information about the athlete’s experience (e.g., Callow, Hardy & Hall, 2001). Moreover, this process allows assessment of the participant’s reactions to treatment procedures and experimental outcomes (Pates, Maynard & Westbury, 2001). Post treatment interviews have also been regarded the most effective means of assessing

¹² The IES was included in the second case study only, following in depth clinical assessment by Therapist A, who considered it to be an unnecessary additional measure, and potentially disruptive to Athlete A’s required focus on training and competition demands.

symptom reduction in a range of anxiety-based disorders (e.g., Tarrier, 2001). Taking into consideration the aims of the current research, and implementation of a new treatment method in this environment, it was also deemed appropriate to conduct post-intervention interviews with the EMDR therapists, sport psychologists, and athlete's coach (case report one). This process was supported by the collection of session-by-session data, and also enabled the primary researcher to confirm accurate interpretations of all aspects of the intervention.

The interview schedule¹³ was constructed using a deductive approach to create a pre-determined set of themes and categories about the intervention (Patton, 2002). Interview questions were designed to provide the following: information relating to the participants experience of EMDR and their perception of its overall effectiveness for the treatment of LMS and the yips (e.g., extent of symptom reduction); information from the EMDR therapist outlining the procedure followed (from formulation of the problem to completion of EMDR sessions), information identifying the level of sport psychologist and coach involvement, and their observed effectiveness of the intervention. The inclusion of this process provided assessment of observable changes during the intervention that coincided with improved performance for the athletes, both in and outside of the sporting environment. Thus, extensive triangulation of the data was made possible. Interviews were conducted in the participant's natural performance environment on completion of treatment. Following data collection the primary researcher transcribed all interviews verbatim. Where appropriate, extracts from the raw data have been included in each case study report.

¹³ See Appendix 12 for interview guides.

For the benefit of the reader, each case study will be presented separately, and in its entirety, before a general discussion and a summary of research findings conclude this chapter.

5.5 Case Report One

5.5.1 Athlete A.

Athlete A was a 21-year-old male athlete, who presented all of the criteria for LMS (Day et al., 2006). Specifically, the athlete had experienced an involuntary movement disturbance manifesting in a loss of control, coupled with extreme anxiety, fear, panic, loss of awareness, and involuntary muscle tension during execution of a particular dive from 5m. This dive provides the foundation skill chain for a more complex dive from 10m which was included in the athlete's competition repertoire, a dive that the athlete has been able to perform consistently, although not without concern. When describing his first experience of this problem the athlete said: "I didn't know where I was or what was happening and I did an extra move, landed on my back, and thought oh my god what was that. It was such an intense feeling of fear I can't explain it."

5.5.1.1 Background.

Traditionally in diving, when an athlete struggles to execute a particular skill, the approach taken is to break it down into its constituent parts (e.g., lead-up, twist, pike, tuck, etc.) and practice each aspect separately (Tenn, 1995a; 1995b). However, previous research (e.g., Day et al., 2006), and study one of this thesis has suggested that this technique has failed to work with LMS. Highlighting this the athlete's coach reported: "I tried everything I tried fixing the skill, I tried backing away, I tried changing technique, I tried behavioural stuff, I tried everything and nothing worked." Importantly, the athlete's sport psychologist also reported that "we weren't getting anywhere using traditional cognitive behavioural techniques like thought-stopping, visualisation; it didn't get anywhere near fixing the problem, there's always been

some level of anxiety around it, it was a massive pressure cooker situation.” As a result of this, and the lack of success cognitive methods provided, she added that, “there was some blocker that we weren’t getting to consciously and there are two very specific moments in time that I think [Athlete A] needs to process in a different way to how we have tried to do it consciously.”

The athlete reported several other symptoms experienced as a result of the problem, including hyper-vigilance, avoidance behaviour, ruminative thought patterns, obsessive tendencies, flashbacks, exhaustion, and disturbed sleep. For example he explained:

“I have never been the same since, I am really hypervigilant about everything, I get paranoid and really anxious about everything now, I can’t get it out of my head it’s like it has taken over my whole life.....[I’m] exhausted just worrying about it all the time.”

Again, Athlete A reported repeated unsuccessful attempts to overcome the problem with various technical adjustments, distraction training, positive talk, and visualisation. When discussing some of these methods, the athlete said: “I didn’t like talking about it because it made me anxious and scared so I completely avoided talking about it,” and “it’s really hard for me to visualise, I just can’t do it.”

5.5.2 Therapist A.

Therapist A was a Consultant Clinical and Forensic Psychologist registered with the Health Care Professions Council (HCPC). He had over 17 years’ experience in the NHS working across the lifespan with individuals presenting with complex mental health, behavioural, attachment, and developmental difficulties. He also had extensive experience of working across a range of settings including elite sport,

mental health, social care, criminal justice, business, and legal environments.

Therapist A had also been a certified EMDR practitioner since 2006. Initial contact was made with Therapist A by the primary researcher who met with him, explained the case, and confirmed his interest and commitment to working with Athlete A as part of the research programme.

5.5.3 Intervention.

The intervention consisted of eight sessions of EMDR with Therapist A, combined with a programme of exposure therapy supported by Sport Psychologist A, who had a five-year history of working with the athlete. Due to the unique context of sport, it was necessary to involve the athlete's coach in the planning and delivery of the intervention. This required facilitated communication and group review sessions led by Sport Psychologist A. These took place prior to every formal meeting, and informally between sessions. As suggested by Murphy and Murphy (1992), it is important for practitioners to familiarise themselves with the athlete's sport and environment to promote effective communication and identification of key factors that might impact on performance, and the success of the intervention. Thus, prior to the start of the intervention, Therapist A familiarised himself with the athlete's training environment, and became a known member of the athlete's support team, establishing a good rapport with both the athlete and coach through general discussion on the psychological aspects of the sport. Specifically, Therapist A attended several training sessions during which he observed the athlete and coach in the performance environment, and also met with the coach, athlete and Sport Psychologist A following training to build rapport. The therapist also obtained video footage of the athlete performing in competition.

The total intervention period covered 16 weeks from inception to the final review session. Issues regarding confidentiality were discussed during the first meeting, and both the coach and athlete provided informed consent to continue. It was made clear that withdrawal from the study was permitted at any time up until the point of publication. The follow-up (social validation) interviews were conducted four months after the final review session. As aforementioned, these interviews were led by the primary researcher and conducted with Therapist A, the athlete, the athlete's coach, and Sport Psychologist A.

5.5.3.1 EMDR protocol.

To ensure treatment fidelity, Therapist A adopted the eight-stage standard EMDR protocol (see section 5.4.2.1 for a comprehensive description; Shapiro, 2001). Three sessions focussed on stages one and two: client evaluation (including full mental health assessment), case formulation, history taking, and client preparation. Additional focus was placed on educating the athlete and coach on the mechanisms of EMDR and the anxiety cycle. Reprocessing of significant life-events (TMs) was covered in four separate sessions, each lasting approximately 90 minutes. A final review session took place at one, and four months post-treatment. Prior to each EMDR session Therapist A observed the athlete in the training environment, and also met with the coach, and sport psychologist to review progress. This enabled direct observation of general anxiety in the training environment, and towards execution of the affected skill. Therapist A and Sport Psychologist A also met regularly with the primary researcher to share details of each treatment session conducted with the athlete, and monitor progress throughout.

5.5.3.2 Exposure therapy.

Exposure therapy involved regular sessions of vivo exposure to harmless but anxiety inducing stimuli (see Table 5.2). This was guided by a hierarchical exposure plan developed between the athlete, coach, and sport psychologist, in which situations associated with the performance problem were identified according to the respective level of anxiety they induced. The athlete identified lowest anxiety associated with visualisation of the affected-skill at a height of 10m (SUD = $^3/_{10}$), gradually moving up to performing the skill from 5m (SUD = $^{10}/_{10}$). Traditionally in vivo exposure is managed by the therapist and comprises of live sessions and homework assignments (Taylor, Thordarson, Maxfield, Fedoroff, Lovell & Ogrodniczuk, 2003). However, based on the unique context of the current case study, it was necessary for Athlete A's coach to manage the integration of these exercises into regular training sessions. Thus, once each level of the plan had been identified, the sport psychologist discussed the importance of integrating prescribed practices into normal training sessions, during which the athlete could specifically target each level of exposure from least, to most anxiety evoking. It was agreed that the sport psychologist would maintain regular communications with the coach and athlete on this process throughout the intervention.

5.5.3.3 Session one.

Psychological disorders require a thorough case formulation prior to treatment, regardless of the frequency and duration of treatment sessions (Shapiro, 2001). Thus, formulation of the current case took place over two sessions. In the first session, the athlete's goals regarding the intervention outcome were established. Specifically, he reported that he wanted to be able to train and compete the dive from 10m with the same level of expected performance anxiety that he experienced when

training/competing any other dive (due to the potential risk of injury involved in this sport, and relative level of competition the athlete was exposed too, a certain amount of anxiety is considered appropriate). He also wanted to stop using avoidance strategies, ruminating about the problem, and engaging in obsessive behaviours both in and out of the sport environment. An overarching aim was to regain performance control, and enjoyment of training. Once the athlete's goals had been established, the sport psychologist guided the athlete and coach through the construction of a graded exposure plan (see Table 5.2.). After each level had been identified, the sport psychologist, athlete, and coach discussed the requirements for effective integration of this plan into the athlete's existing training. It was agreed that the sport psychologist would manage this process informally through weekly review sessions and regular communications with the coach.

In accordance with stage one of the EMDR protocol: formulation and client history taking (Shapiro & Solomon, 1995), Therapist A explored the athlete's current performance problem, including the associated behaviours and symptoms, significant events from the past that might have triggered the problem (i.e., earliest and/worst memory of the problem occurring), and present situations that cause distress. During this session the sport psychologist facilitated conversation around the mechanisms underpinning anxiety, and other psychological symptoms the athlete was experiencing (e.g., rumination, avoidance, fear). The impact of anxiety under heightened pressure, and, in particular, the effects of psychological problems on physical and mental fatigue were also discussed. This was considered particularly important following the participant's reported level of fatigue associated with the problem: "I would be exhausted for just worrying about it and thinking about it and just having it in my head all day and night." The first session concluded with a description of how the

Table 5.2: *Situations attached to increased amounts of anxiety experience where SUD score of 0 = no anxiety experienced; and SUD score of 10 = extreme anxiety.*

Step	SUD (0-10)
Doing 5m	10
Lead up on 5m	9-10
Thinking about 5m	9
Doing 1m	8
Doing 10m	7-8
Watching 1½ twist	7
Visualising 1m	5
Watching 2½ twist	4-5
Thinking about 10m	3-4
Visualising 10m	3

intervention process would proceed, and a detailed plan was constructed based on training and competition schedules, athlete and coach goals, and the requirements of the intervention whole. The athlete and coach expressed their desire/commitment to continue with the intervention, and mutually convenient times were identified for the following session.

5.5.3.4 *Session two.*

Following introductory conversation, Sport Psychologist A explored the athlete's current state of well-being and performance. Further education was then provided on the anxiety cycle, including the causes and effects of avoidance behaviour, and the psychological processes involved in LMS. This was driven by the athlete's interest in understanding his performance problem, and the relationship between symptoms experienced in and out of the environment. The sport psychologist also highlighted the importance of developing coping skills (e.g., relaxation techniques, challenge thinking) to manage maladaptive thinking patterns/behaviours associated with LMS that might persist post-intervention (and that treatment was not necessarily a quick fix). The sport psychologist and coach then left the session, and Therapist A continued working with the athlete on stage one: formulation and client history-taking.

During the history-taking process, it became apparent that one of the potential TMs related back to the athlete's first experience of LMS, when attempting one component of the affected skill chain from a 5m board. The athlete reported that "something went wrong and it scared me, and I ran away from it [environment] really scared and upset." Since this experience, the athlete reported being able to execute more complex versions of this skill chain from a variety of different heights (e.g., 10m/7.5m). However, the athlete had never regained the ability to execute that

specific part of the skill from the 5m board. It also transpired in this session that the athlete was unable to visualise the lost skill from 5m or the more complex dive from 10m (although he could still execute it), something he did frequently with every other skill. The athlete attached a SUD score of $\frac{8}{10}$ to this TM.

A second potential TM involved an experience where the athlete was performing the same skill chain identified above in a more complex dive from 10m, in an international competition. Following a momentary external distraction at the point of take-off from the board (camera flash), the athlete was flooded with anxiety and lost control of his performance. Despite going on to successfully execute the dive on a second attempt, the athlete recalled the most traumatic part of the experience were the moments immediately before taking a second attempt during which he was overcome with fear. The athlete reported that this aspect of the memory was an $\frac{8}{10}$ on the SUD scale. Several other significant experiences were identified throughout the history-taking process (including two major World Championship and Olympic experiences involving LMS). These experiences and associated SUD scores were all recorded by the therapist. Therapist A highlighted that the athlete experienced considerable difficulty verbalising TMs, and discussing the symptoms he was experiencing in relation to his performance problem. When reflecting on discussions with the athlete, the sport psychologist described his speech as “stumbled and broken, each description being broken up with several stopping points when the athlete literally appeared to experience a mental block, and was unable to communicate his experience fluidly.” This is important as it highlights the less-conscious nature of the problem, and lack of language/rational thought to explain it.

The athlete was asked to identify any other maladaptive symptoms associated with the problem that might be current triggers. It emerged that the problem was

impacting on the athlete's social functioning, with numerous anxiety cycles being demonstrated outside of the environment that related directly back to the LMS experience. For example, the athlete was engaging in several neutralising and obsessional type behaviours that followed a similar pattern of anxiety to LMS. The athlete discussed ruminating about the problem: "I wouldn't be able to get it out of my head; it was something I thought about all the time, I felt like it had taken over my life", and engaging in various obsessive behaviours: "I would be really panicky about what I would eat or what time I would go to sleep; I would think something would go wrong if I hadn't eaten the right food." It is likely that these behaviours exacerbated the level of anxiety associated with the affected skill and performance environment. Other maladaptive symptoms included, perfectionism, avoidance, intrusive thoughts, hypervigilance, and hyperarousal. For example the athlete reported: "I am really hypervigilant about everything now like I get really paranoid now about anything to do with that event it makes me really anxious."

On completion of session two, Therapist A summarised progress so far with the athlete, and established his comfort to end the session there. On closing, Therapist A and the athlete met with the coach and sport psychologist to review the formulation process and intervention thus far, providing opportunity for any further discussion to be had, and questions/concerns to be raised. No concerns were identified and so before departing mutually convenient times for future sessions were agreed.

Once the athlete and coach departed, Therapist A shared his formulation in more detail with the sport psychologist, describing the performance problem as: "indicative of an anxiety-based problem, conceptualised in a trauma framework, so in the form of generalised anxiety but attached to a specific traumatic incident that needs to be worked through." Therapist A also reported "lots of anxiety-cycles that the

athlete is engaging in outside of [sport], including ruminating, obsessional and neutralising/checking behaviours, all of which relate back to the problem and his anxiety is going up, and up, and up.” Other key symptoms identified were “perfectionism so you know everything’s got to be right all the time, and also hyper-vigilance relating back to triggers in the initial event.” Finally, Therapist A discussed “clear symptoms of hyperarousal, avoidance, and intrusive thoughts and memories linked to one particular incident.” This reinforced the appropriateness of the intervention plan, and more specifically of EMDR as a tool to facilitate the processing of specific memories, embedded within a wider intervention plan consisting of graded exposure, and education.

5.5.3.5 Session three.

In session three, Therapist A completed stage one of the EMDR protocol: history-taking, before moving onto stage two: client preparation (establishing a “safe place”, and discussing resource installation). Therapist A used the AIP model to conceptualise the athlete’s presenting symptoms. Cognitive themes included a lack of control, guilt, loss of ability, and a sense of hopelessness. Negative cognitions, or conclusions of self (Grey, 2011) were as follows: a) “I am not in control,” b) “I can’t do this,” and c) “It’s unfair.” The negative cognition “I am not in control” was associated with the most anxiety inducing memory. Further, the theme of losing control and unfairness was pervasive across the athlete’s self-report. In accordance with the standard EMDR protocol, the athlete and therapist worked together to develop an appropriate target-sequencing plan for identified TMs, present triggers, and future-desired outcomes identified in the formulation stage. Four memories were listed on the target-sequencing plan, with associated SUD scores:

1. First experience of LMS on 5m board in training (SUDs = $10/10$)
2. Experiencing overwhelming emotion during a performance at an Olympic Games (SUDs = $10/10$)
3. Picturing a wall during a performance at a World Championship event (SUDs = $8/10$)
4. Loss of control and severe panic during an International competition (SUDs = $9/10$)

At this point Athlete A identified his want to start with two less traumatic TMs (designated three and four on the target-sequence above), and address the remaining two only once he had familiarised himself with the protocol. This target-sequencing plan was also used as a self-report tool to confirm the athlete's experiential progress. On completion of the session the sport psychologist and coach returned, and the session was summarised and dates for future sessions agreed.

5.5.3.6 Session four.

In session four, Therapist A began reprocessing the first TM with the athlete (stages 3-4). This TM was associated with an experience at a world championship, where, as the athlete took off from the board, he "saw a wall...this picture of the concrete wall and bubbles." SUD score was $8/10$, the negative cognition was "not being able to control this", and things "being unfair", positive cognition was "I can do this well", but the athletes validity of this cognition was $2/10$. The athlete also identified avoidance behaviour and sadness relating to a significant bereavement at the time of the TM event. The athlete reported an initial increase in physical sensation talking about the memory. After five sets of eye movements SUD score lowered to

³/₁₀, and validity of cognition increased to ⁴/₁₀. Therapist A observed signs of physical relaxation (e.g., yawning, rubbing shoulders, and relaxed posture). The session was closed down at this point after activating the safe-place, installing the positive cognition, and doing a body scan relaxation exercise (stage 5-7). The athlete reported feeling clearer but noticeably tired. Before leaving, the therapist, sport psychologist, athlete and coach confirmed upcoming training demands, reviewed progress, and current level of performance on the exposure scale. It was also agreed to continue regular communications with the sport psychologist to allow the athlete to reflect, continuing the healing process.

5.5.3.7 Session five.

Therapist A, the sport psychologist, athlete, and coach all met at the start of session five to review progress to date, exposure practices, and identify any significant events/issues arising in the previous weeks. The sport psychologist reported positive impact on social functioning, reduced avoidance of the 10m dive (supported by progression on exposure plan), and overall increased clarity around the maintaining effects of avoidance and anxiety cycle. The coach reported positive impact on performance in training, specifically observing increased willingness to approach the 10m dive, and reduced anxiety attached to it. This was aligned with the exposure plan that the athlete and coach were implementing in training. The athlete reported feeling clearer in what he needed to do “if you avoid the thing that scares you then you keep avoiding it and it just reinforces the fear so I need to stop avoiding it,” having reduced anxiety towards the training environment, and being more able to rationalise performance errors. The athlete also reported positive effects on social functioning, particularly involving reduced intensity of rumination and obsessive, rule governed behaviours (although these were still significant).

On completing stage eight of the EMDR protocol, Therapist A expressed concern that the athlete might still be engaging in a significant amount of avoidance behaviour, specifically around the TM addressed in the previous session, and that the reprocessing of this TM was incomplete. As such, he was eager to continue reprocessing this TM prior to moving on. SUD's were $\frac{4}{10}$, the positive cognition was "I am in control, I know what I want to do," and validity of cognition was $\frac{4}{10}$. Several sets of eye movements brought the SUD's down to $\frac{3}{10}$, and validity of cognition was $\frac{5}{10}$. The athlete reported being clearer about what he needed to do, and had changed his perception of the TM to feeling safe, accepting of the fact that the TM was a past memory. Throughout the first two re-processing sessions, the athlete had been holding his chest tightly and also holding his breath. When Therapist A addressed this with the athlete he uncrossed his arms and focussed on slowing his breathing, this was supported by re-processing sets focussing specifically on these physical feelings. Following reprocessing the athlete reported that: "I was remembering getting lost and seeing a wall, and then as we were doing it [BLS], the wall seemed like it was getting further away, and it felt weird as though the whole problem was getting a lot smaller in my head." This session was completed in line with stages six and seven of the EMDR protocol: body-scan and session closure, before meeting with the rest of the team to summarise and agree future TMs.

5.5.3.8 Session six.

Session six began with the athlete and Therapist A reviewing progress to date: stage eight. The athlete identified considerably less avoidance towards the training environment and the dive on 10m. The athlete also reported increased challenge of negative thinking, reduced rumination, and improved overall performance in training. Reprocessing began on the fourth TM identified in the target-sequencing plan,

negative cognition was “not being in control,” and “I’m not good enough.” The athlete recalled that the worst part of this memory reporting that his anxiety levels “just went whoosh.” Negative cognitions at the time were “what will people think,” “I am a failure,” “what if I fail again,” “it is not fair on other people,” and “I am guilty of upsetting other people.” SUD score was $9/10$. After a couple of sets of eye movements, numerous channels were opened up, all linking back to the original TM addressed in sessions four and five. Therapist A observed signs of physical tension, the athlete holding his chest, rubbing his shoulders, and holding his breath. Notably all of these symptoms reduced towards the end of the session when the therapist observed him physically relaxing. SUD score went from $9/10$, to $2/10$, and validity of cognition increased to $6/10$. The athlete also commented “...wow I don’t know where that came from, I am surprised how much I bottled up...I never talked about all of this before, I just never talked about [TM], I was just so relieved when it was over that I tried to forget about the re-dive.” The athlete also reported, “feeling released.” When reflecting on the session, Therapist A described the session as “so powerful you could literally feel the shift; I literally felt him change and the reprocessing speed up.” The session was brought to a close after 90 minutes with stages five, six and seven: revisiting the safe place, body-scan, reviewing safety plans, and confirming social support.

5.5.3.9 Session seven.

Between session six and seven, the athlete had attended two international competitions where he had performed the dive from 10m, and subsequently had progressed through the exposure plan to level eight (thinking about executing the skill from 5m). The athlete reported that on both occasions the anxiety experienced prior to performance was comparable to all of the other dives he performed. General levels of

anxiety were substantially lower throughout the competition, and the athlete reported an absence of ruminative thought patterns in competition, training, and also outside of the training environment, “I just don’t think about it now.” The athlete reported overall reduction in anxiety in relation to the two TMs processed so far, as well as improved willingness to train the dive at 10m (supported by progression on the exposure plan), and improved social functioning. Specifically, he identified reduced obsessive behaviours, improved ability to recognise avoidance behaviour, and readiness to neutralise and challenge maladaptive behaviours early on.

Therapist A and the athlete revisited the experience of LMS and the first TM processed (stage eight of the EMDR protocol). SUD score for this TM was $3/10$. Further, when the positive cognition of “I am in control” was added to the original presenting complaint, the athlete indicated a validity of cognition score of $8/10$. The athlete reported that he considered this to be a necessary level of anxiety for the context; “I don’t think I’ll ever go below that because the sport is dangerous, so I am always going to have some anxiety, it’s necessary.” A future template was administered at the completion of reprocessing (stage five), synthesising the athlete’s positive cognition of “I am in control.” Specifically, the athlete envisioned experiencing the feeling of being in control, positive emotions, non-intrusive anxiety, and use of relaxation. On completion of stages six and seven the session was brought to a close and the athlete departed.

5.5.3.10 *Session eight.*

Session eight consisted of a review with Therapist A, the athlete, coach, and sport psychologist, followed by a one to one between the athlete and Therapist A. Therapist A reported that the athlete was visibly more relaxed and able to verbalise his experiences in a relaxed manner, with improved clarity. The level of emotion

associated with his experiences was significantly reduced, and the athlete reported less hypervigilance in training, competition, and social functioning. He was also engaging in fewer avoidance behaviours associated with the environment. Essentially, the three core symptoms associated with the problem during the stage one of the EMDR protocol (i.e., ruminating on intrusive thoughts and memories, hypervigilance, and avoidance), all significantly reduced based on self-report, observation, and coach report. Furthermore, this was impacting more broadly outside the specifics of the environment.

The remainder of this session focussed on the minimal physical and emotional content still attached to the two TMs addressed in processing sessions, these remaining emotions related to other peoples critical perspectives of not being understood, pressures relating to elite sport, and feelings of paranoia. On completion of this session stage six assessed previously identified triggers. The participant indicated that the triggers all earned a SUD score of $0/10$, and the positive cognitions “I can do this,” “I am in control” were considered to be true according to validity of cognition scores of $7/10$ and $8/10$ respectively. The therapist administered a final future template for each of these positive cognitions to end the session (stage 5-7).

At this point, the intervention with athlete A came to an end as both the athlete and coach felt that they had achieved their aims. Specifically, Athlete A’s level of anxiety experienced in association with executing the effected dive from 10m had considerably reduced, to the extent that he could train and compete it without debilitating anxiety. Furthermore, the athlete and coach confirmed that performance had progressed to level eight on the graded exposure plan (thinking about executing the skill from 5m), and whilst additional progress might have been achieved by continuing treatment and addressing the remaining two TM’s identified on the target-

sequencing plan, competition schedules constrained the feasibility of this, and both the athlete and coach were satisfied that they had achieved their aims. Thus, EMDR reprocessing sessions lasted for a non pre-determined length of eight sessions over 16 weeks. No further treatment was provided after the eighth EMDR session when it was mutually agreed that the intervention goals had been accomplished. The sport psychologist remained in contact with the athlete and coach in a supportive capacity.

5.6 Intervention Evaluation

5.6.1 Performance success.

The study design consisted of baseline performance measures by self-report and visual observation (e.g., ability to execute the affected skill, and relative level of anxiety experienced), prior to the intervention, at frequent mid-points during the intervention, and finally on completion of the intervention. Specifically, Athlete A and the athlete's coach reflected on his ability and willingness to train and compete the affected dive, in addition to the subjective level of anxiety experienced in association with the dive. Performance improvements were also made according to exposure treatment, along which the athlete progressed to a level eight out of ten. Consistent with previous research, Athlete A also reported substantial reduction of avoidance behaviour towards the disturbing stimulus (i.e., the training environment and performance of the affected skill). When reflecting on this aspect of the intervention, the athlete reported: "when we looked at the ladder of how scary things were that was coming down dramatically." Importantly, the athlete and coach confirmed that level eight was a satisfactory point at which to complete the intervention, and that performance had more than improved enough to compete.

5.6.2 Subjective Units of Distress (SUD) scores (Wolpe, 1973).

SUD scores for the first TM to be processed were reduced from $8/10$ to $3/10$, and for the second major TM SUD score lowered from $9/10$ to $2/10$. Details pertaining to this outcome has been discussed in each respective session outline in which reprocessing took place.

5.6.3 Reflections on intervention.

The interview data reflected that as a result of the intervention, the athlete experienced a reduction of ruminative thought patterns: “I just don’t think about it anymore, I get there, train, and it just doesn’t bother me now,” and of irrational beliefs associated with the performance problem: “it made me see clearer about what I needed to do and how lots of my thinking had become completely irrational and it made me think more rationally about things.” The athlete also highlighted a substantial reduction in obsessive, rule-governed behaviours he was engaging in both socially, and towards the affected skill. The athlete reported feeling more relaxed, and his general mood/emotional response to training more positive: “it was like a dimmer switch where it was slowly getting easier and easier I can just do each training session as it comes now, I don’t think about it anymore.” Furthermore, the athlete’s coach expressed: “the problem was definitely all in his head and he obsessed about it, he was terrified of it and I think that’s where the EMDR really helped, he lessened all of his destructive habits.”

These positive effects were reinforced by Therapist A, who confirmed: “in terms of rumination, intrusive thoughts, avoidant behaviour, hypervigilance, and general level of anxiety, they all significantly reduced in the athlete’s report, my observation, and coach report. That was impacting not only on his ability to train, but

also more broadly with regards to his social functioning.” Therapist A went on to suggest that: “whilst EMDR played a part in that, the ladder [graded exposure], and continued reflection and talking also really helped the processing. Indeed, the athlete considered the exposure treatment to be extremely useful as it provided a visible measure of performance improvement towards his desired outcome goal: “using the ladder of where I wanted to get too, and having my goal of being able to bring down the anxiety I experienced really helped; it helped knowing the next stage I was working towards and I saw myself moving up.”

With regard to the overall impact of the intervention, the athlete reported that he was pleased with the support that he had received, and felt that his overall anxiety had reduced to the extent that he was now performing better, and had also achieved significant benefits outside of sport: “when that [LMS] started not being so much of a problem I felt other things loosening up and all my other performances were getting better too.” The performance improvements made by the athlete were also evident in his competition scores recorded throughout the intervention period.

Despite the decision being made to end treatment once sufficient improvements had been made, both the athlete and coach identified that further improvements might have been achieved had they continued with more frequent sessions, over a longer period of time. However, this was very much constrained by training and competition commitments, allowing for insufficient contact time away from competition to support treatment. Specifically, the athlete’s coach reported: “there wasn’t enough time because of competition schedules so ideally we would have done more but sport doesn’t give you that availability we are constrained by the competition calendar; when you compete at this level that’s just how it is.” In

summarising the overall success of the intervention, the sport psychologist said the following:

I think there were two more important memories that were never re-processed, so as a result whilst he is still not able to do part of the affected skill-chain, he is able to execute the dive from 10 with comparable levels of anxiety to all his others. He has got to a point where he is not fearful of it anymore he's not scared or abnormally worried about it and it's no longer having an impact on his life outside sport. The work that he has done through the EMDR process has had a significant impact on his life and on his ability to compete that dive and for the athlete and the coach they'd achieved their outcome because they're able to train and compete that dive. Its not keeping him awake at night, he's not ruminating about it, and he's not worrying about it. It's not having an impact on his life so its almost like they don't want to risk it they don't want to risk going there when he's competing alongside the best in the world.

This comment suggests that whilst EMDR enabled reprocessing of two significant-events, to the extent that performance improved, it is possible that remaining traumatic memories continued to maintain the root cause of the problem. A perspective shared by therapist A.

When describing her role throughout the intervention the sport psychologist highlighted the particular importance of providing a familiar sounding board for the athlete to reflect and offload emotional pressures. The sport psychologist also reported that this process perhaps facilitated the EMDR treatment and processing of significant memories in between sessions.

With regard to the appropriateness of EMDR for the treatment of LMS in elite sport, Therapist A reported: "clearly the evidence so far would support that EMDR is an effective treatment for these problems," and also that: "any good systemic

intervention with a trauma focus for an anxiety-based problem of this kind should adopt EMDR or similar.” Furthermore, the sport psychologist said:

I think those two specific moments in time were traumatic to the extent to which his brain was protecting him from executing that skill and just him talking about those experiences and the level of anxiety he felt etc., I just felt EMDR got to them in a way conscious techniques and everything else we had tried had not been able to.

Finally, Athlete A’s coach said:

The whole intervention was absolutely awesome, it was torturous for [Athlete A] that at that elite level we couldn’t understand why he suddenly couldn’t do something he had always been able to do, why just suddenly he couldn’t do it anymore no matter what we tried. You know these are traumas we’re talking about.

Notwithstanding the success of this method, Therapist A highlighted the importance of taking the time to educate and prepare both the athlete and coach on the mechanisms of the performance problem and EMDR treatment process, as well as having a sport psychologist involved to facilitate communication, reflection, and support the overall intervention. The following quote from therapist A emphasises the importance of integrating this method into a wider intervention:

I think if you’d have just gone in delivered EMDR and come away without the broader theme, I am not sure it would have had the same impact and arguably it could have been less than helpful... you know the wrong pace you are going to get dips and curve balls and so it needs to be viewed as a clinical process embedded in a more supportive intervention with the sport psych

5.7 Conclusions

This case study illustrates the potential uses and benefits of a multistemic intervention using EMDR and exposure therapy to treat LMS. More specifically, it demonstrates a relationship between significant life-events, anxiety, and LMS. And that addressing significant life-events whilst gradually re-exposing oneself to anxiety-

inducing stimuli, effectively improved performance, reduced levels of anxiety, and lessened avoidance of the problem. This intervention also reduced several other symptoms associated with the problem (e.g., fear, panic, obsessive habits, rumination), highlighting an overall positive impact on the athletes social functioning. Although a large part of the success of this intervention was undoubtedly the EMDR process, the contribution of the exposure therapy was also clearly crucial to the athlete's development. Indeed, the athlete and coach had a proactive role in all phases of the intervention, particularly with regards to the integration of exposure therapy to training. Thus, this study demonstrates the importance of tailoring the intervention to meet the specific demands of the individual and the context. The current case study drew to a close based on mutual agreement that the athlete and coach had achieved their goals. However, further improvements could arguably have been achieved had the intervention continued, and additional significant life-events addressed.

In summary, the case reported here illustrates how EMDR combined with exposure therapy can serve to alleviate the symptoms associated with LMS. Further research needs to be conducted to assess the effectiveness of this intervention in different contexts.

5.8 Case Report Two

5.8.1 Athlete B.

5.8.1.1 Background.

Athlete B was a 58-year-old male golfer who presented all of the criteria for the yips in golf (McDaniel et al., 1989; Rotheram et al., 2007). Specifically, the athlete was experiencing involuntary spasms, shaking, muscle tension, and jerking in the lower left forearm when executing a putt. Physical symptoms were coupled with extreme anxiety, panic, and frustration. When asked to describe his first experience of this problem, the athlete stated:

There was a sensation of a muscle spasm in my left wrist, a vibration and tightness which I couldn't control there was nothing I could do about it. It was like a brake and accelerator fighting each other I've no idea where it came from it just suddenly appeared. It's like a mental illness now, it's fearful and I don't know when it's going to happen.

The problem first occurred in competition when the athlete was attempting a 3ft putt on the 18th green. For a few weeks after this occurrence the athlete experienced no further disturbance, however, the problem later returned in a non-competitive game. The athlete recalled how the problem suddenly returned, and proceeded to escalate in severity. For example, the athlete said: "it came back absolutely out of nowhere and then built up and up and up, to the point it got worse and worse, and bigger and bigger, and you can't control it, you just can't play anymore." Thus, after 30 years competing at major championship events, the athlete was effectively forced to retire from the game.

Treatment for the yips in golf has traditionally involved making technical changes to hand grip, modifying the length of the putter, or changing body stance (e.g., Philippen, Legler, Land, Schuetz & Schack, 2014). However, as research has evidenced, these methods have provided at best only mild relief of associated symptoms for a problem that frequently returns or transfers to other contexts (Klampf, Philippen & Lobinger, 2015). Indeed, Athlete B had adopted several different methods to treat the problem (e.g., using a long putter, putting with one hand, standing at a different angle, and using a weighted club), none of which had alleviated symptoms. During a pre-treatment interview the athlete reported: “I’ve changed stances, put the ball in different positions, used longer putters, shorter putters, heavier putters, all these sorts of things but it’s not worked remotely, I can still feel it.”

The athlete reported several other symptoms resulting from the problem, including extreme and persistent anxiety, nervous dread related to the sport in general, disturbed sleep, avoidance behaviour, ruminative thought patterns, fear associated with the skill, broken relationships, and isolation. When asked to discuss these symptoms the athlete said: “it takes over your life and you don’t talk to anyone because it feels like a mental illness and you’re afraid of it, I’m worrying about it all the time and in a state of fear because I’m fighting against a problem I can’t control and it’s a losing battle.” Athlete B also discussed struggling to remain positive outside of the sport: “It’s hard to stay positive about anything when this thing controls your life; I went from massively positive to massively negative it was like role reversal.” Finally, when asked if he was able to visualise himself successfully putting, the athlete stated: “I can’t even see the positive image anymore.” Based on self-report collected during formulation of the problem, it appeared that the athlete’s experience

of the yips was impacting severely on his social functioning as well as performance as a whole, a consistently emerging theme being anxiety.

5.8.2 Therapist B.

Therapist B was a Consultant Clinical Psychologist registered with the Health Care Professions Council (HCPC). He had over 15 years experience providing mental health care, consultation, and training to a range of organisations working with young people. Therapist B also had experience providing mental health care in the context of elite sport, and is a certified EMDR practitioner. The primary researcher made initial contact with Therapist B after being contacted by the athlete. On meeting with Therapist B, the primary researcher described the case, and discussed the extent of his involvement should he wish to proceed. Therapist B confirmed his interest and an initial meeting with the athlete was arranged.

5.8.3 Intervention.

The intervention consisted of eight sessions within which an EMDR therapist and sport psychologist delivered a combined intervention of EMDR with exposure therapy to treat the yips. Prior to the start of the intervention Sport Psychologist B and Therapist B familiarised themselves with the athlete's environment, establishing a good rapport with the athlete through general discussion on the psychological aspects of the sport. This was aided by the Therapists personal experience playing golf, and the sport psychologist's knowledge of the game more generally. The total intervention period covered 27 weeks from inception to the final review session conducted 5 weeks post-treatment. Issues regarding confidentiality were discussed during the first meeting, and the athlete provided informed consent to continue. It was made clear that withdrawal from the study was permitted at anytime up until the point of publication

of the findings. Pre- and post-intervention performance success was also collected in the form of observation, self-report, and kinematic data.

5.8.3.1 EMDR protocol.

Consistent with the previous study, and to ensure fidelity of treatment protocol, Therapist B adopted the eight-stage standard EMDR protocol (see section 5.4.2.1 for a comprehensive description; Shapiro, 2001). Specifically, two sessions focussed on stages one and two: client evaluation (including full mental health assessment and completion of the *impact of events scale*; IES), case formulation, history taking, and client preparation. Additional focus was placed on educating the athlete on EMDR, components associated with the yips, and more specifically the underpinning anxiety component. Reprocessing of TMs was covered in two separate sessions, each lasting approximately 120 minutes. A final review session took place five weeks post-treatment (including post-intervention IES completion). Prior to each EMDR session Therapist B met with Sport Psychologist B to review progress. This ensured consistent integration of EMDR treatment with graded exposure, and allowed both practitioners to effectively monitor the athlete's progression throughout the intervention period.

5.8.3.2 Exposure therapy.

Exposure therapy for the current intervention involved weekly sessions of in vivo exposure to harmless but distressing trauma-related stimuli. Exposure exercises were hierarchically arranged from least to most anxiety evoking, as identified by the athlete (see Table 5.3). Specifically, the athlete was guided through the process of identifying a series of situations associated with the performance problem, towards which he experienced increasing levels of anxiety. These were then arranged in order

of least to most anxiety inducing (*where SUD 0 = no anxiety experienced; and SUD 10 = extreme anxiety*). These boundaries were more specifically defined by the athlete as: *SUD 0 = “feeling the speed of my arms, control of my arms, and inner calmness”; and SUD 10 = “electric shock in my arms, not in control of my arms, intense anxiety inside.”*). Athlete B identified seven different situations that were progressively more anxiety inducing, with lowest anxiety associated with putting on the green alone ($SUD = 2/10$), and highest anxiety associated with playing an individual event and entering a scorecard ($SUD = 10/10$). Once each level was identified, the athlete and sport psychologist discussed the importance of weekly practice sessions, during which the athlete would target each level, from lowest anxiety to highest, and record relative SUD scores with each practice. These practices would be supported by the Sport Psychologist B, and facilitated with weekly-prescribed homework (e.g., increasing amounts of daily practices).

5.8.3.3 Session one.

The first session involved formulation of the problem between Sport Psychologist B and Athlete B. In this session the athlete's wants and needs of the intervention were established. Athlete B reported that he wanted to be able to “go back out and play a round of golf again, just be able to hit the thing like I used too without this disease [the yips] in control of me.” Further to this, the athlete identified wanting to compete again in a local pro-amateur competition. An overarching goal for the athlete was to recapture the level of enjoyment he used to associate with playing. Once the athlete's goals had been established Sport Psychologist B guided him through the construction of an exposure plan (see Table 5.3). Once this had been constructed, the athlete agreed to monitor his progress according to the ladder, recording SUD scores for each daily practice session. Sport Psychologist B arranged

to review the athlete's progress on a weekly basis. Before departing the sport psychologist summarised the session and established the athletes understanding of the intervention process. On completion of the session, dates were arranged for the next meeting between the athlete, sport psychologist and EMDR therapist.

Table 5.3: *Situations attached to increased amounts of anxiety experience where SUD score of 0 = no anxiety experienced: “feeling the speed of my arms, control of my arms, and inner calmness”; and SUD score of 10 = extreme anxiety: “electric shock in my arms, not in control of my arms, intense anxiety inside”.*

Step	SUD score (0-10)
Playing an individual event and entering a scorecard	10
Playing a round as part of a team	9
Game scenario with two other players	8
Putting with another pro on the green	7
Putting with another player on the green	6
Setting individual targets on the green alone	4
Putting on the green alone	2

5.8.3.4 *Session two.*

Following informal discussion Sport Psychologist B explored Athlete B's current state of well-being and performance. Athlete B discussed completing several practice sessions on the first two levels of the exposure plan: putting on the green alone; and setting individual targets on the green alone, SUD scores for these two practices were $\frac{8}{10}$ and $\frac{9}{10}$. The sport psychologist explored athlete B's motivations for attempting the second level of exposure at this stage, highlighting the importance of moving slowly, and developing coping skills to manage anxiety levels. Athlete B recognised a felt urgency to overcome the problem, but also that he had deliberately looked for practice opportunities "when no one has been around." He also reported experiencing severe anxiety just thinking about going out to practice. This was explored in more depth, specifically focussing on the underpinning anxiety component and education around that. The athlete agreed to progress more slowly in the coming weeks, continuing to explore his anxiety experience.

The sport psychologist then departed and Therapist B began stage one of the EMDR protocol (Shapiro, 1999): case formulation and client history taking. Specifically, Therapist B explored the athlete's current performance problem, associated symptoms, and conducted an in depth history taking of significant life-events. During this session Athlete B identified several significant-events across the life-course, including the early death of his father when he was 2 years old, and adjustment to his mothers remarriage at the age of 10. When recalling a particular period of his life involving a major career transition, Athlete B described how he "completely flipped out and just lost it." Other life-events identified included family disruption following his fathers death, the later death of his mother and sister, substantial work-related stress, and unstable relationships. Importantly, Athlete B

highlighted substantial emotional suppression throughout his life, driven by the need to “not to be a burden to others and upset other people.” Sport specific events identified included several yips-related experiences. The most notable of these was the first experience that occurred during a team event in a professional competition, when the athlete was attempting a 3ft putt on the 18th green, the final shot to secure the game for him and his team.

Symptoms reported at the time of these events included extreme fear, confusion, and consequently avoidance of situations that might cause embarrassment or failure (e.g., public speaking, dancing, heights, learning a new skill, and vomiting). Some of these symptoms might have been linked to protection during his early years towards which he recalled: “I was over-cared for and never ever allowed to take a risk or make a mistake.” Indeed, Athlete B was unable to identify a time he had failed, and stated: “no I would never attempt anything if I thought I might not be able to do it, that would just be embarrassing.”

When the session came to a close, Therapist B provided a summary and agreed a date for the next meeting. Following the session Therapist B shared his formulation with the sport psychologist. When asked to summarise his diagnosis the therapist stated:

It appears to be an anxiety-based difficulty in a performance context. There are clear signs of insecure-avoidant attachment style whereby [Athlete B] has learnt to suppress emotion that is likely accompanied with beliefs about needing to care for others, avoid failure, and please everyone. A number of significant events have been identified that have only served to exacerbate presentation of the yips.

This report was supported by scores revealed on the IES, for which the athlete recorded a total score of 36 (total avoidance = 13, $M_{\text{avoidance}} = 1.6$; total intrusion = 11,

$M_{intrusion} = 1.4$; total hyperarousal = 12, $M_{hyperarousal} = 2$), indicative of the extreme trauma associated with the yips. Therapist B confirmed that the EMDR aspect of the intervention would support Athlete B in making links between significant life-events and anxiety-based symptoms currently used to manage painful emotions. Specifically, it was hoped that EMDR might assist Athlete B in appropriately processing the emotional, cognitive, and behavioural content attached to a number of painful memories.

5.8.3.5 Session three.

Session three started with a review led by the sport psychologist of Athlete B's progress to date. Athlete B discussed several practices over the preceding few days in which he experienced lower levels of anxiety putting on the green alone ($SUD = 2/10$). As such, progression to the next level was agreed: setting individual targets on the green alone. Specifically, Athlete B set the goal of accumulating as many consecutive successful putts as possible at distances of three, four, and six feet. The sport psychologist then departed and Therapist B and the athlete continued.

In accordance with stage two of the EMDR protocol: client preparation (establishing a safe place, and discussing resource installation), Therapist B explored Athlete B's felt sense of safety associated with different contexts, before identifying a suitable safe place to visually return too after each re-processing set. The therapist and athlete then worked together on developing an appropriate target-sequencing plan for TMs, present triggers, and future desired outcomes identified in the formulation stage. The athlete specified wanting to start with sport-specific memories associated with the yips, potentially moving to other memories once he felt comfortable with the procedure. As such, three memories were listed on the target-sequencing plan:

1. 2011- Missing a 3rd putt in a professional competition (SUDs = $\frac{8}{10}$)
2. 2006 - On a training course with fellow professionals and hitting a shot on the range that skewed left. Embarrassment felt when he was asked if he wanted second attempt in front of the other professionals who were all younger than him (SUDs = $\frac{9}{10}$)
3. 2004 – Missing a bunker shot in a game with the club captain (SUDs = $\frac{10}{10}$)

The athlete and therapist agreed to start processing the first TM. SUD score was $\frac{8}{10}$, negative cognitions were “I have to be perfect (and please everyone)” and “I am not in control of my own body.” Positive cognition was “I can be myself,” and the validity of cognition was $\frac{5}{10}$. The athlete identified associated feelings of embarrassment and shock, as well as tightness in the chest, shaky legs, and feeling hot in the face (embarrassment).

After approximately 12 sets of BLS, SUD score lowered from $\frac{8}{10}$ to $\frac{0}{10}$. The athlete also reported absence of tightness in the chest and stomach; reduced warmth in the face/flush; stillness, and mental clarity. Athlete B was unable to reactivate an image of the TM and reported: “feeling nothing” when Therapist B revisited this memory. Therapist B observed relaxed posture and use of humour that he later described as a possible coping mechanism for underlying anxiety. When the therapist addressed this with the athlete he identified feeling “anxious about the process and not wanting to get it wrong.” The session was drawn to a close on activating the athlete’s safe-place (stage 5), installing the positive cognition: “I can be myself” (stage 6), and completing a body scan (stage 7), through which no remaining sensations were reported. Before the athlete departed Therapist B discussed possible processing effects that might continue, and the athlete agreed to discuss these with the sport psychologist. A date was arranged for the next session.

5.8.3.6 Session four.

The sport psychologist met with the athlete to review progress. The athlete reported that he had generally been very busy and “at everyone’s beck and call,” and had therefore not been able to practice as much as he might have liked. As a result, he recognised increased levels of frustration and annoyance at having not practiced much. However, he also reported that he had taken a few days off in the past month, something he had never done before. Although he had not been able to practice as much as intended, Athlete B reported having played two rounds of golf; one on his own, and one with a committee member, consequently progressing towards level five on the exposure ladder: game scenario with two others. The athlete reported that the round with the committee member had started with him skewing his first tee shot off to the left, but that he had laughed about this because he had “predicted that this would happen.” He also implied that this was a result of the club he had selected and not his fault (possibly indicating further avoidance and denial). Athlete B expressed the desire to continue playing nine holes on a regular basis, however, he acknowledged wanting to be on his own initially to avoid spectators witnessing and forming the opinion he needed practice.

The sport psychologist explored Athlete B’s current level of anxiety associated with the yips, and his perception of the EMDR treatment component. When prompted Athlete B said that he still “felt nothing” when recalling the first TM (SUD = $0/10$). However, he said that he was due to play on the same course twice in the next couple of weeks in a practice round, and then again in the same event as the first TM took place (scratch foursomes). He attached a current SUD score of $7/10$ to this event, but recognised the need to match his expectations to his current form. The session

concluded on arranging a date for the next meeting, prior to which the athlete agreed to continue practicing nine holes.

5.8.3.7 Session five.

Session five consisted of the third meeting with Therapist B, and stage eight of the EMDR protocol. Athlete B discussed recalling several other memories from his past since the previous session, and that he has also remembered more details related to events already discussed. Specifically, Athlete B reported the cause of his fathers' death, and that he had never spoken to his mother about this because "I wouldn't want to upset her, no way I would ask about my father's death." He said that he could not recall how his mother had coped with his father's death because he had been so young, and he would not want to delve into this topic years later. He also remembered being looked after mainly by his sisters as a younger child and that his mother had worked as a cleaner. Athlete B felt that he could have been a burden at this time because he was so much younger than his siblings, and acknowledged the desire to protect his mother as she was stressed. Finally, in terms of his current relationship with his partner, he accepted that he would tend to listen to her difficulties/stresses with work etc., but avoided talking about his own as "she would view my work as the enemy because it keeps me away from her."

On completing stage eight, the therapist was concerned about remaining anxiety associated with the first TM that was readdressed with further processing. SUD score was $3/10$, negative cognition was "I have to be perfect (and please everyone);" and positive cognition was "I can be myself," with validity of cognition $3/10$. After several sets of BLS, SUD score lowered to $0/10$, validity of cognition increased from $5/10$. The session was concluded at this point after satisfying stages five to seven (safe-place, installation, and body-scan). Before departing the therapist

discussed some goals to try before their next meeting. Specifically, it was suggested that Athlete B try expressing his own needs and emotions little and often, and also protect some personal time. Athlete B agreed to do this and reflect on progress in their next session.

Following the session Therapist B contacted the sport psychologist to summarise content and progress made.

5.8.3.8 *Session six.*

In session six, the sport psychologist met with Athlete B on the putting green at his club, where the athlete continued to practice throughout the meeting. During this discussion, the sport psychologist explored performance improvement and symptom reduction. The athlete reported that he had played a friendly round with three others at one of the courses he had experienced the yips on several years ago (level eight, and nine on exposure). He reported experiencing extreme levels of anxiety from the point of leaving his house ($SUD = 9/10$), and that these feelings escalated throughout the day ($SUD = 10/10$). Physical sensations were tingling and shaking in the forearms, jerky movements on the putting green, and an “electric shock feeling” on the 18th; the same green of his original yips experience. These symptoms resulted in an inability to putt, and subsequent avoidance of finishing shots, suggesting his partner took them. Athlete B discussed how he was able to “laugh it off” during the game with excuses, however left feeling embarrassed and “like a failure.” This session lasted approximately two hours, during which the athlete talked about the emotional, cognitive, and physical sensations in great depth until he reported feeling much clearer about the experience and able to put it into perspective.

This was considered to be an important part of the healing process (Shapiro, 2001), allowing the athlete to work through the event, and develop a greater level of

understanding and perspective than perhaps he had at the time. On closing the session the sport psychologist discussed future performance goals according to exposure treatment, and the athlete's desire to return to the course he recently played at and play a full round in a competition (the highest level of exposure). Athlete B recognised that the timing of this competition was "not ideal given his situation" (i.e., most recent experience and overriding yips), however he identified a "need to confront it again and get over this damn thing [the yips]." Following the session the sport psychologist contacted Therapist B and reflected on the discussions she had had with Athlete B. Therapist B was due to meet with the athlete later that week and would therefore be able to explore any remaining anxieties confirming processing effects.

5.8.3.9 *Session seven.*

Therapist B met with the athlete and following informal discussion revisited the athlete's recent performance. Athlete B identified some initial anxieties, however following reflection was able to clearly verbalise the experience with no further emotional or physical feeling. The therapist therefore completed stage eight (reassessment) of the initial TM. Treatment effects identified included increased communication in his relationships, and a need to understand the context of early family bereavements. The athlete discussed how he had never really known what happened to his father, or how he had found out about his father's death, but that since starting EMDR felt an increasing desire to find out. Although he was considering contacting his sister to discuss this, he recognised significant avoidance and fear surrounding negative cognitions of "not wanting to upset her," and "not knowing how she will react." To facilitate this discussion the therapist discussed the avoidance of distressing emotions as a means of protecting the self, and how this natural process

might be playing out in the current context. After much discussion the athlete appeared to validate the situation more appropriately.

On revisiting the first TM, Athlete B reported no further disturbance or distress. The second two TMs were then addressed, to which the athlete reported no further distress or disturbance, and complete absence of physical sensations including flushness, tightness, and shakiness. Following further exploration the athlete and therapist concluded no additional processing was required for the first three TMs identified, but that the athlete would consider addressing some of his early memories associated with earlier lifetime events (e.g., death of his father and family disruption). A future template was administered at the completion of stage five of the protocol, synthesising the athlete's use of the positive cognition "I can be myself." Specifically, the athlete envisioned feeling calm, relaxed, and enjoying putting on the green in competition, where physical movement control was natural, automatic, and relaxed. The athlete agreed to continue focussing on the use of his positive cognition: "I can be myself," protecting personal time on a daily basis, and pursuing decisions/activities not considered to be safe options. Importantly, when discussing this, the athlete indicated that the validity of the positive cognition had increased from $5/10$, to $8/10$. The sport psychologist then joined the session, the remainder of which was carried out on the putting green. The athlete reported complete absence of physical sensations, reinforced by recent performances. When asked to recall his first and most severe yips experience, the athlete again reported no emotional, cognitive, or physical sensations. Furthermore, Athlete B highlighted several upcoming competitions he was entering, and that he was beginning to see himself getting over this problem [the yips].

The athlete agreed to focus on discussing his emotions and needs more openly with valued others (e.g. friends/family). On departing it was agreed that the need for

further formal sessions would be assessed following competition, and the athlete would keep both the sport psychologist and Therapist B informed of progress.

5.8.3.10 *Session eight.*

Session eight was conducted five weeks post-treatment, and consisted of a full intervention review with the athlete, therapist and sport psychologist. Prior to this session the athlete and sport psychologist had been in communication regarding the athlete's experiences of competition. Specifically, the athlete had competed in two competitive team events, during which he experienced mild performance related anxiety ($SUD = 4/10$). However, physical sensations associated with the yips were completely absent throughout his performance, and anxiety dissipated as each game progressed. The athlete identified considerably less anxiety towards the golf course in general, and reduced physical tension on playing every level of the exposure ladder. When reflecting on his most recent performances the athlete said that although he had not played as well as he would like, he attributed this to relative lack of practice over the years in comparison to his peers, and that this was to be expected.

The sport psychologist observed signs of physical relaxation, calmness, and openness to verbalising the emotional content of his experiences, something he had normally suppressed. The athlete reported that on certain putts (at distances of three, and four feet), he had experienced a small amount anxiety in the form of tightness in the chest and intrusive negative thoughts ($SUD = 3/10$), but when the sport psychologist explored the context of this in more depth, the athlete attributed these symptoms to performance anxiety associated with returning to competition, and were not likened to the yips feelings. Importantly, the athlete confirmed that "it's [the yips] not there anymore, the feeling in my arms the electric shock it's not there at all." The

athlete appeared relaxed and chatty throughout the session, and spoke positively about his performance.

Additional effects included absence of ruminative thoughts, memories, and worries associated with the identified TMs. When prompted to recall these memories the athlete reported no discomfort. Importantly, the athlete acknowledged that discussing each event more openly had helped him to reappraise memories, and that since doing EMDR these experiences were significantly less important to him. Specifically, he reported having placed too much emphasis on this problem for years, and was now more able to take perspective. Furthermore, this was impacting more broadly outside of the environment, in which the athlete was engaging in frequent communications, verbalising his emotional experiences, and was benefitting from improved relationships. Athlete B also discussed significant resolve from understanding the context of significant events experienced in childhood, and how these events impacted on his current behaviour, thoughts, and beliefs.

The athlete reported that he had not increased his practice hours as much as he would have liked, however had entered three competitions. Athlete B reported that he experienced anxiety when thinking about playing in these events ($SUD = 7/10$), but added he was not to put pressure on himself, and felt confident that his previous yips problem would not return. He described noticing that his concentration and focus had improved whilst playing golf over the last few months, and was aware of being more relaxed/feeling comfortable with the environment (able to filter out the noise, and focus on positive outcomes). Although the athlete was more willing to assert his needs, therapist B recognised avoidance around protecting personal time, and that this was perhaps maintained by underlying beliefs. Finally, athlete B described feeling

like he was “half way across a rope bridge”, and was positively excited about continuing to move forwards.

The intervention came to an end when the athlete’s aims had been achieved. That is, he no longer suffered from the physical, emotional, or cognitive symptoms associated with the yips, and performance success had improved both in training and competition. The athlete discussed enjoying playing again, and had experienced significant benefit in social functioning. The athlete confirmed he was now able to execute the skill at the highest level of anxiety identified on the exposure ladder, and reported no remaining symptoms associated with any of the TMs addressed through EMDR. Post-intervention performance measures (kinematic data, observation of success rate, and IES scores) confirmed these effects, and so it was agreed to conclude the intervention at this point.

5.8.4 Intervention evaluation.

5.8.4.1 Performance success.

This case study consisted of performance measures by visual observation, self-report, and kinematic data. The athlete achieved a putting success rate of $5/10$ at three feet, and $4/10$ at four foot distances. Post-intervention these scores were $10/10$ at both distances. Performance improvements were also made according to exposure treatment, along which the athlete progressed to the final level of exposure (competing in a pro-amateur event), experiencing complete absence of the yips and only mild levels of performance anxiety.

5.8.4.2 Subjective Units of Distress (SUD; Wolpe, 1973) scores.

SUD scores recorded throughout the EMDR treatment process demonstrate reduced anxiety levels associated with significant life-events that might have

contributed to the yips. Specifically, SUD scores for the first TM were reduced from $8/10$ to $0/10$, from $9/10$ to $0/10$ for the second TM, and finally from $10/10$ to $0/10$ for the third TM – although it should be noted that no actual processing took place for this particular TM as SUD scores had reduced prior to it being targeted. This was likely a side effect of processing done on the first two TMs, and the reduced severity of anxiety more generally. A full breakdown of scores is discussed above in relevant session descriptions. Subjective anxiety levels associated with the yips experience were also recorded prior to the intervention start, and again on completion of the intervention. According to the IES, severity of anxiety associated with the yips prior to treatment was 36 (total avoidance = 13, $M_{\text{avoidance}} = 1.6$; total intrusion = 11, $M_{\text{intrusion}} = 1.4$; total hyperarousal = 12, $M_{\text{hyperarousal}} = 2$), and post-intervention this score had reduced to 0 on all components.

5.8.4.3 Kinematic data.

Figures 5.1 and 5.2 illustrate putter face rotation angle and putter face rotation angular velocity, from the top of the backswing through to forward swing, impact is denoted by the vertical line. Visual inspection of the data from baseline to post-intervention suggests increased smoothness and grouping of the data, implying more control over the putting stroke, in comparison to the irregular data collected during the initial yips measurement.

More specifically, velocity of putter face rotation post-intervention is illustrated by close, smooth lines, characteristic of a smooth putting stroke (Marquardt, 2009). This data suggests that the involuntary movement disturbance was causing the jerky movement of the club head on impact with the ball. This improvement coincides with lowered levels of anxiety, and increased performance success according to visual observation.

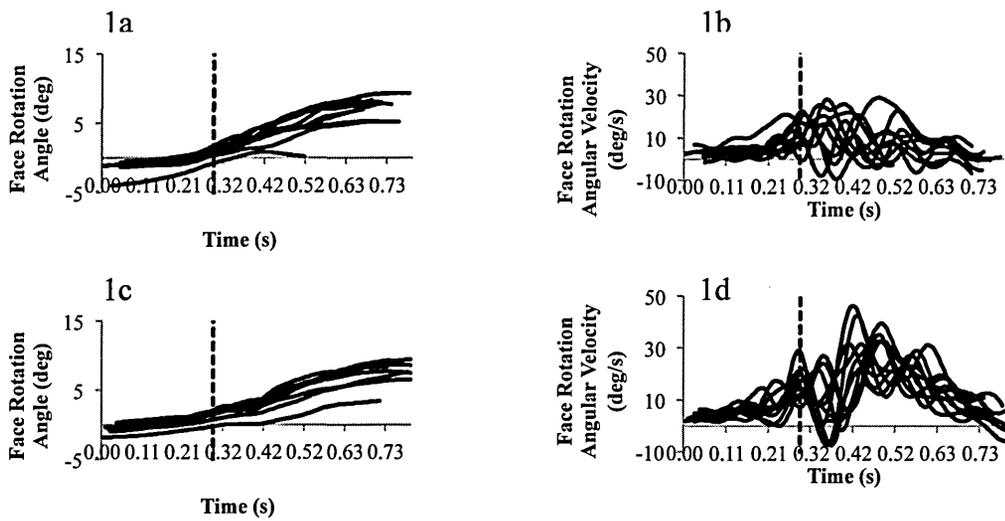


Figure 5.1. *Pre-intervention data illustrating face rotation angle and face rotation angular velocity for putts from 0.91 m / 3 feet (1a & 1b) and 1.22 m / 4 Feet (1c & 1d). Data is shown from the top of the backswing to the finish of the stroke, vertical line indicating impact.*

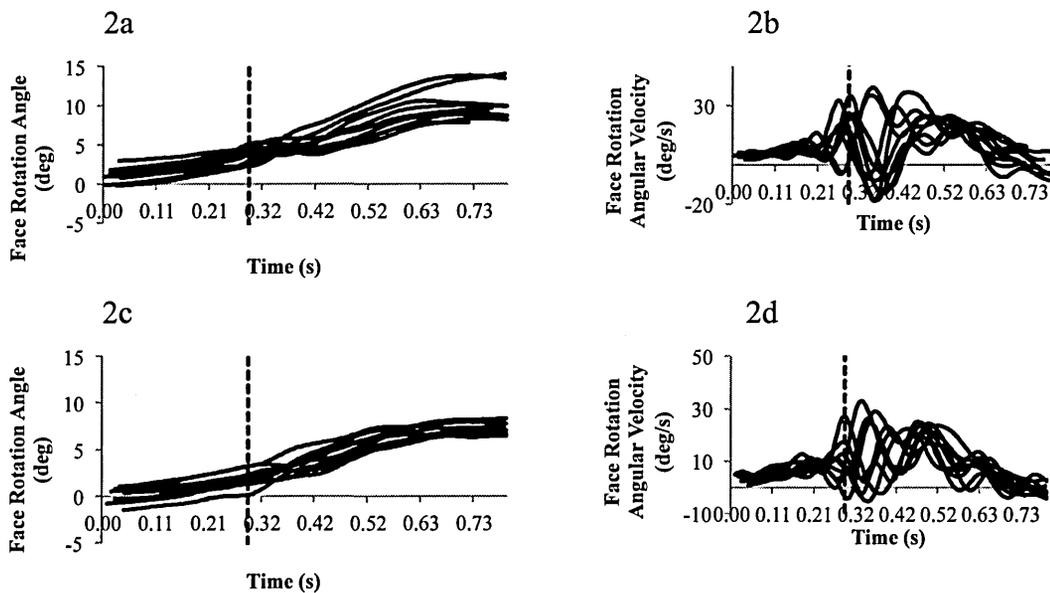


Figure 5.2. *Post-intervention data illustrating face rotation angle and face rotation angular velocity for putts from 0.91 m / 3 feet (2a & 2b) and 1.22 m / 4 Feet (2c & 2d). Data is shown from the top of the backswing to the finish of the stroke, vertical line indicating impact.*

5.8.4.4 Reflections on intervention.

On completing the intervention, Athlete B highlighted several improvements in performance and social functioning. For example, when asked about his current level of anxiety associated with the yips he reported:

I just don't feel it anymore, I can't feel it even if I try too. I am not thinking about it at all, I don't worry about it I don't get the same nerves I did because of it at all because there's no feeling there anymore, no brake-accelerator feeling in my arms, nothing like that. I don't think I'll ever fully understand yet why EMDR and talking about memories has made all that freer and go away, but it has it's really worked. I can comprehend now that it's totally a mental thing and how the mental thing caused the physical thing.

The scores derived from the IES administered post-intervention further support this, confirming no remaining anxiety associated with the yips. Athlete B indicated that he believed these improvements were a direct result of the intervention, and that as a result of treatment he was "in a better place than I have ever been before." He also identified several activities he was engaging in that he previously would never have imagined. He talked in particular about improved family relations, increased communication with his siblings, and a different relationship with his wife. These improvements were evident in his performance on the golf course where he was no longer ruminating, losing focus, or avoiding taking putts. Interestingly, the athlete also reported that he had stopped the nervous habit of biting his nails, something he identified doing since he was a small child. When asked about this he stated:

My inner thoughts weren't even given a thought before this treatment basically it was just a mess but it's beginning to get a bit clearer; it's just like little boxes opening that suddenly I am doing other things, like I've stopped nail biting and things which is completely off the wall; it was just a nervous thing but I would never have related them to each other but I'm beginning to understand.

Athlete B suggested that his perceptions of the yips had changed in general, and that he no longer viewed them as such a severe performance problem. He stated:

That's another positive thing to come out of this; the change in perspective, you know. I know if I go out there now it's just completely different feeling, I feel like a different player that [the yips] aren't with me anymore, and I know that if I ever experienced anything like that again, that I would be able to manage my emotions way better, they just wouldn't effect me, thanks to this I understand all that now.

When asked how he was playing in comparison to before experiencing the yips, he recognised that he wasn't at the same level, however he did state:

After the last couple of games I am excited to play again and my next goal now is to regain the level that I used to play at, I know this will come with increased pressure and expectation but I can manage that now I have the coping strategies and I understand it all now so I am looking forward to the challenge and even better I know I can manage it if it comes back this time.

When thinking back to the significant events highlighted at the outset the athlete stated:

I just didn't get over all that at the time and I don't know what happened I can't explain the yips but if it ever happened again I would be so different now I understand myself better.

When asked to talk about the impact of the intervention on social functioning, and other symptoms associated with the yips the athlete stated:

I have realised it's ok to talk, I would talk about it all with someone now, I talk about my emotions more and I am not afraid of that, that has been such a huge turning point for me; just being able to do that it's helped no end I never spoke to anyone about anything until I started working with you.

In a three month post-treatment follow-up with Athlete B, he reported that he was competing in professional competitions with complete absence of yips associated feelings. Furthermore, he reported gaining considerable enjoyment in retuning to competition, and complete absence of nerves associated with the putting stroke when under enough pressure for it to be a “true test of treatment effects.” Finally, Athlete B went on to state “I played 18 holes without a single bad feeling on the greens, it was the best I have felt for years, I have a different mindset now it’s magic!”

When reflecting on the effectiveness of EMDR Therapist B stated:

The value of EMDR in this context is in it’s structure, specifically around creation of a safe place; it gave the physical intimacy for [athlete] to connect with, and give feedback on his internal state, where in the body the feeling was, and feeling the flush in his cheeks; I think initially there was a level of embarrassment towards that but then to realise it was a safe environment and he could experience that safely was an extremely powerful part of it.

Therapist B added to this that possibly the most important aspect with regards to sport was sharing the formulation of the problem with the athlete and sport psychologist, and educating the athlete on underlying components, the impact of anxiety on the body, and effective storage of memories. In terms of specific challenges for use of EMDR in elite sport, Therapist B suggested:

Developing a safe therapeutic environment that is consistent is always going to be a challenge in sport, coupled with maintaining the intensity of sessions around training and competition commitments. Also consideration of various other stakeholders [e.g., coach/performance management etc.], they all need educating, and they all have input into the outcome goals of the treatment so you have to factor that in, so a massive focus needs to be on their education for the intervention to be a success.

This was reiterated by the sport psychologist who highlighted the importance of establishing trust and engagement from the athlete, and maintaining a team approach to intervention delivery throughout.

5.9 Conclusions

In summary, the current case study provides triangulated evidence for the use of EMDR and exposure therapy for the treatment of the yips. More specifically, it demonstrates a relationship between significant life-events, anxiety, and the yips in sport, and that addressing these components facilitates substantial performance improvement. Whilst it is likely that EMDR played a considerable part in the success of this intervention, the inclusion of exposure therapy was evidentially a crucial part of the treatment protocol. The current intervention plan ended when the athlete had achieved the goals identified from the outset: overcoming the physical symptoms associated with the yips, and therefore alleviating maladaptive cognitive, behavioural, and emotional symptoms. As a result of the intervention the athlete returned to competition with a complete absence of physical movement disruption, and improved social functioning in all affected areas.

5.10 Discussion

The emerging similarities between the yips, LMS, and anxiety-based disorders, posits that treatment methods for anxiety disorders might also be effective for the yips and LMS. In accordance with the recommendations of APA (2013), and NICE (2005), the purpose of the current study was to explore the effectiveness of a combined intervention of EMDR and exposure therapy for the treatment of the psychological components associated with the yips and LMS. Due to the lack of existing research using this method for the yips and LMS, a second aim was to comprehend the athletes' experiences of receiving EMDR. It was hypothesised that by treating psychological components and painful emotions attached to significant life-events, the physical symptoms of the yips and LMS would subside. After a thorough review of the literature, EMDR was deemed the most appropriate treatment method as substantial evidence has been provided to support its use for the treatment of anxiety-based disorders, and specifically those triggered by trauma experience (Shapiro, 2001; 2012). Exposure therapy was included based on substantial evidence supporting its use for reducing avoidance behaviour, managing intrusive thoughts, and in enhancing ecological validity of treatment effects via direct, supported exposure to problem environments (Crask et al., 2014; Taylor et al., 2003).

The results indicate that treating a yips-affected golfer, and LMS-affected diver with an integrative plan of EMDR and graded exposure effectively alleviated problem symptoms, and improved performance. The results demonstrated in these two cases were achieved with eight formal treatment sessions, across a period of 16 (LMS), and 27 (yips) weeks respectively. Traditionally, treatment sessions for mental health issues are delivered on a weekly basis at the therapist's place of work, and remain relatively intensive until treatment is ceased (Grey, 2011). However, the

contextual demands relating to competition calendars meant that EMDR treatment sessions were intermittently spread over the course of relatively long periods. As such, weekly informal support facilitated communication between therapists, athletes, and the athlete's coach (Athlete A), ensured integration of the two treatment methods, and monitored the prescribed practice required for exposure treatment. Importantly, findings from the current study support that diluted EMDR treatment with frequent sessions of exposure therapy might also be effective.

Prior to each intervention, assessment by visual observation, self-report, and performance success identified severe anxiety, involuntary movement, muscle tension, shaking, and spasms in both cases. Post-intervention these symptoms were no longer apparent in the case of Athlete B, and considerably lessened with Athlete A. In addition, Athlete B's putting success had increased to 100% success rate at three and four feet, whereas prior to treatment, success rate was 50% (3 feet), and 40% (4 feet) respectively. Kinematic data collected for Athlete B supports these findings, and provided an explanation as to why the yips might cause performance to decrease so dramatically. Specifically, when measured prior to treatment the participants putting stroke displayed large variability, characterised by sharp peaks and troughs upon impact with the ball. However, after the intervention this variability had substantially diminished, illustrated by smoothness of the lines, which are indicative of a smooth stroke (Marquardt, 2009). Due to the nature of the two environments, kinematic data collection was only feasible for the second intervention. Thus future research is required to support these findings across sports.

The design of this study makes it difficult to distinguish the overall effectiveness of each treatment method, however it is evident that by the end of each intervention both athletes benefitted from reduced symptoms associated with the

problems, and had improved performance of the affected skills. Social validation data collected on completion of each intervention indicates that these benefits were a direct result of treatment. In both cases, social functioning had significantly improved, and maladaptive behaviours surrounding the problems were alleviated. Importantly, improvements were all evident in the athlete's respective training and competition environments, providing preliminary support for the ecological validity of the intervention.

Previous research using EMDR has shown that an individual's perceptions of an event, and personality can alter through the course of treatment, as significant life-events and associated emotions are effectively processed (Greway, 2003). Interview data collected on completion of each intervention would appear to support this, as both participants said that as a result of treatment they attached far less importance to the problem (yips/LMS), engaged in frequent communication related to emotional experiences, and experienced considerably less rumination and obsessive behaviours. Care must be taken interpreting these findings as no direct measures can be provided to support these claims. However, one direction of future enquiry would be to assess personality characteristics prior to the intervention, and again on completion. Specifically, whether scores on the FMPS (Frost et al., 1990), ruminative response scale (Nolen-Hoeksema, 1991), and reinvestment scale (Masters et al., 1993) are reduced following EMDR and exposure treatment, as these characteristics have all been related to the yips and LMS.

Findings from the present study provide support for studies one and two. More specifically, the psychological components of the yips and LMS appear to include extreme anxiety, hypervigilance, fear, loss of movement control, and extreme avoidance behaviour. Furthermore, both athletes reported a history of emotional

suppression, reluctance to express thinking habits, and numerous obsessive habits. Importantly both of the current cases had previously adopted a variety of cognitive methods to treat the problems (the yips/LMS), and reported no success on all occasions. As previously reported, significant life-events and trauma experience have been associated with the onset and development of various psychological disorders (Scaer, 2014; Shapiro, 2012). Based on the notion that memories associated with significant-events are physically stored deep in our unconscious mind (Ehlers & Clark, 2000; Scaer, 2014), it is likely that EMDR facilitates healing at a level CBT is unable to address. The mechanisms behind EMDR's effectiveness remain controversial. It has been suggested that EMDR might be a variant of TF-CBT as it involves exposure, cognitive processing, and talk-therapy (Australian Centre for Posttraumatic Health, 2007). Notably, one of the assets of EMDR is that it integrates elements of psychodynamic, cognitive-behavioural, person centred, and interactional therapies into a standardised protocol (Shapiro, 2001). Several randomised controlled studies comparing EMDR with exposure therapy have reported relatively equivalent outcomes (Maxfield, Shapiro & Kaslow, 2007). Indeed, the current findings suggest that both of these methods contributed significantly to treatment effectiveness.

According to the AIP model on which EMDR is based, (Shapiro, 2001), information attached to every experience is stored in memory networks, these contain related thoughts, emotions, images, and sensations that link to specific memories. A central tenet of EMDR is that if traumatic experiences are not processed effectively, they will be stored in their raw emotional state, and become the basis of dysfunction. Via the physiological information processing system, new associations can be forged with previously stored material (e.g., traumatic memories), bringing them to a more adaptive resolution, and subsequently relieving emotional distress. It is thought that

the eye movements involved in EMDR enhance this process. Indeed, research has shown that the use of eye movements alleviates the vividness of traumatic memories, allowing improved access to, and subsequent processing of the content of the memory (e.g., Hout, Muris, Salemink & Kindt, 2001). In essence, it is thought that EMDR alleviates emotional distress by facilitating access to painful memories, and bringing them to more adaptive resolution (Shapiro, 2001).

According to this view, if the maladaptive symptoms associated with the yips and LMS result from unprocessed memories associated with significant life-events, accessing these memories and bringing them to adaptive resolution with EMDR, will in turn cause dysfunctional symptoms (e.g., anxiety, avoidance, loss of movement control) to subside. Indeed, the present study provides preliminary evidence to this effect. Specifically, it has been demonstrated that addressing significant life-events associated with the yips/LMS resulted in symptom reduction and performance improvement. It should be noted that each therapist spent a relatively brief amount of time reprocessing. Furthermore, it was agreed in both cases, that reprocessing would initially address sport-specific memories directly associated with the yips/LMS, rather than any other, arguably more traumatic life-events that were identified during history taking. Thus, it is recognised in both cases that further improvement might have been achieved had reprocessing continued to other, non-sport related TMs. However, it is also acknowledged that treatment ceased when the goals of the athlete and coach (Athlete A) had been achieved, and not when all identified TMs had been addressed.

Exposure therapy predicts relief of symptoms by desensitisation, through which the client learns a more appropriate response to a particular threatening stimulus (Foa, 1997). The efficacy of exposure therapy for reducing symptoms of re-experiencing, avoidance, and anxiety has received wide support, yielding the highest

success rate in overcoming PTSD when compared with other forms of treatment (e.g., Taylor et al., 2003). The current findings are consistent with substantial research supporting the use of exposure therapy for the reduction of avoidance and anxiety (Taylor et al., 2003). Although EMDR is favoured for its lack of homework and therefore reduced treatment time (Ho & Lee, 2012), constraints of the current research meant that less frequent EMDR treatments could be delivered. Furthermore, multiple individuals were involved in the planning and delivery of the intervention throughout, and therefore additional sessions in the form of education, reviews, and performance assessment were required. The integration of exposure therapy therefore provided a structured means of measuring treatment effects throughout the course of the intervention (e.g., symptom reduction and performance improvement).

Although the results from these two case studies were profoundly important, by the very nature of the single case-study design, the results cannot be generalised to larger populations. Specifically, it cannot be assumed that the success of each intervention was not possibly a result of individual differences, exceptional personal histories, or indeed the unique context within which elite sport is placed. Furthermore, it should be recognised that no single treatment is a panacea for every individual, and different approaches can be more appropriate at different times and according to personal scenario (McLeod, 2010).

A second limitation of this study is the application of two treatment methods (i.e., EMDR and exposure treatment). As such, it cannot be ascertained which method yielded most success in alleviating specific components of the problems addressed. However, the use of objective measures, a formal treatment fidelity protocol, and different therapists all assisted in decreasing this threat to validity. Furthermore, various researchers have supported the value of integrating EMDR with other

treatments (e.g., Maxfield, Shapiro & Kaslow, 2007; Shapiro, 2002). Moreover, the aim of the current study was to provide an effective treatment method for the yips and LMS, and not to directly compare the benefits of EMDR in comparison to exposure treatment for this aim.

Reflective practice is a crucial form of information for the development of practice (Anderson, Knowles & Gilbourne, 2004). Thus, reflections from the sport psychologists and EMDR therapists participating in the current research provide an experience-based account of how EMDR with exposure might be effectively used in a sporting context. For example, all practitioners highlighted the importance of collaboration between the athlete, coach, sport psychologist, and EMDR therapist. As such, the sport psychologists spent a significant amount of time with the respective EMDR therapists prior to each intervention phase. This ensured that each therapist had an understanding of the context they would be operating in, technical aspects of the affected skills, training and competition demands, case history, and the uniqueness of the coach-athlete relationship. Each sport psychologist also organised regular review meetings with the respective therapists, athletes, and/or coach throughout treatment.

One of the potential effects of EMDR treatment is cognitive and emotional fatigue from the increased cognitive load of processing (Shapiro, 2001). As such, sessions had to be carefully planned around each athletes training and competition schedule. Furthermore, if the athlete was experiencing emotional imbalance as a result of external factors, or a training incident, this impacted on the ability to engage in a session of EMDR processing. Indeed both Athlete A and the sport psychologist identified the athletes extreme level of exhaustion following EMDR sessions, and that he subsequently felt unable to perform more complex actions. This in mind, exposure

treatment needs to be integrated with much consideration around the athlete's current training demands.

The support needs that emerged for each athlete were very different, illuminated by the formulation of each case, history taking, and in depth assessment. Indeed, the above points reinforce the necessity of the coach and/athlete's involvement in planning and delivery of treatment throughout the process, and that it cannot be as prescriptive or session-by-session structured as perhaps other contexts might favour. Furthermore, the motivation for using EMDR in elite sport will often be driven by the need to overcome a performance problem that is disrupting the athlete's ability to train and compete at the highest level (e.g., the yips/LMS). As such, there will be numerous other stakeholders involved in the athlete's performance and development, highlighting constraints that would not necessarily exist outside of the elite sport environment. Thus, as highlighted by Therapist B, educating all parties involved in the treatment processes is vital.

It is clear that the initial perception and interpretation of any significant experience is imperative to what follows. Specifically, whether the experience remains unprocessed and is stored as a significant, traumatic memory, or whether it is processed in the moment and appropriately discharged. Both the sport psychologist and coach reflected this during their interviews, highlighting the importance of talking through the physical, cognitive and emotional experience of a significant event with the athlete, therefore allowing processing of overwhelming emotional content attached to the experience, in a safe environment. Typically when an athlete has a significantly emotional experience in the training environment, they will be encouraged to 'forget about it,' re-enter the environment and repeat the practice. Based on the evidence presented in the current thesis it would appear that this

approach might only lead to exacerbate the problem, as the emotional distress associated with a significant experience needs to be appropriately processed to prevent it causing further pain, and potentially the development of a performance breakdown.

While EMDR evidently has a place in sport for the treatment of the yips and LMS, it would be unwise to assume the readiness of sport psychologists to be delivering this treatment without appropriate clinical supervision. In many cases it is likely that highly traumatic memories might surface, requiring the support of a suitably qualified clinical therapist. Thus, when an athlete presents all of the symptoms of the yips/LMS, it is recommended that a full case formulation, assessment, and history taking be completed, based on which the level of therapist experience, and practitioner supervision is carefully assessed. One cannot ignore the potential for severe trauma memories to be revealed during processing and it is imperative that the system around the athlete is equipped to manage that.

Although the current study did not intend to assess treatment mechanisms, our findings highlight some important avenues for exploring the essential ingredients of treatment for the yips and LMS. This study supports the growing evidence suggesting EMDR is a fast effective treatment method for emotional or traumatic memories, and that addressing the major emotional component involved in these problems facilitates performance improvement. Whilst the design of the current study makes comparison difficult, it does provide rationale for exploring the role of EMDR in more depth. When considering the efficacy of exposure therapy, coupled with the importance of teaching sufferers not to fear problem-associated stimuli (Foa & Meadows, 1998), it is questioned whether exposure is an important ingredient in EMDR (Deville, 2002).

Indeed, the effects of EMDR might be due to the exposure involved in sessions, in turn facilitating naturally occurring in vivo exposure.

The present study indicates the potential effectiveness of EMDR and exposure therapy for the treatment of the yips and LMS. In these studies, treatment focussed on memories of significant life-events associated with the problem, negative cognitions, anxiety, and avoidance behaviour, which it is believed had contributed to the development and maintenance of these problems. Reprocessing these memories using EMDR, and addressing associated symptoms underpinned by anxiety, resulted in the elimination of dysfunctional symptoms, and improved performance in both cases. Moreover, the present study demonstrates a relationship between previous significant life-events, extreme anxiety, avoidance, and loss of cognitive control associated with development of the yips/LMS, and therefore supports the notion of these problems being similar forms of an anxiety-based disorder. This is further supported by the effectiveness a treatment method originally developed for anxiety-disorders provided.

6.0 Conclusions and Discussion

6.1 Introduction

This chapter provides a summary and evaluation of the findings generated from the current thesis. Theoretical and conceptual developments are presented, followed by recommendations for future research and implications for sport psychologists working with individuals who experience these problems. Finally, the strengths and weaknesses of the thesis are highlighted.

6.2 Summary

This thesis was designed to provide conceptual clarity to the terms described as the yips and LMS. An additional aim was to provide a research base from which the findings could be applied to the treatment of these phenomena. Three studies were designed to demonstrate a progression from theory to practice, and more specifically identify and explore: 1) the psychological components underlying the lived experience of the yips and LMS; 2) the personality characteristics of yips/LMS-affected individuals to identify potential vulnerability factors; and, 3) the development of an intervention programme targeted towards the treatment of these problems.

The purpose of study one was to investigate two of the most prominent forms of performance breakdown from the perspective of World Class sports performers. Specifically, the underlying components of the yips and LMS were explored according to the lived experience of affected individuals. The use of qualitative interviews enabled in-depth exploration of the lived experience of the yips and LMS, and therefore resulted in contributions to the literature that haven't previously been addressed. Findings revealed that the lived experience of the yips and LMS shared emotional, cognitive, and physical components, as well as characteristics pertaining to the wider impact. Indeed, the only factor distinguishing between the yips and LMS

was the physical presentation of the disorders. A key component was the heightened level of anxiety involved and a loss of cognitive and emotional control, primarily manifesting as fear. It also emerged that certain characteristics might be involved in both onset and longevity of these problems. For example, participants reported obsessive patterns of thought, involuntary obsessive behaviours, reinvestment in solving the problem, and self-critical thinking related to the experience. The identification of these psychological characteristics informed the aims of study two. Finally, while it was not a direct aim of study one, all participants discussed attempting to overcome the yips or LMS using cognitive methods. However, none of these techniques had successfully treated their yips or LMS, guiding attention towards the less-conscious component of the issues reported by all individuals.

The aim of study two was to explore individual susceptibility to the yips and LMS, and to quantify the subjective stress response related to these afflictions. Study two adopted measures of perfectionism, rumination, reinvestment, and stress response, to assess these characteristics among yips and LMS sufferers. Findings from this study demonstrated that levels of perfectionism, rumination, and reinvestment were greater in individuals experiencing the yips and LMS, than in matched control groups. Those suffering from the yips/LMS also reported higher levels of stress in response to their worst performance experience than their non-suffering counterparts, comparable to mild trauma. This is consistent with previous research demonstrating that the yips and LMS were related to traumatic experiences (e.g., Day et al., 2006; Rotheram et al., 2012).

Based upon the findings derived from studies one and two, the final phase of research examined the effectiveness of an intervention programme developed to treat the yips and LMS. Given the lack of success achieved through cognitive therapy alone

in treating both the yips and LMS (as highlighted by study one and previous research, e.g., Rotheram et al., 2012), and the subconscious psychological components of the disorders, the aim of study three was to identify an appropriate treatment method targeting the subconscious components evidently involved. Considering the similarities between the yips, LMS, and other anxiety-based disorders, the efficacy of treatment methods currently used to treat such disorders were explored. Specifically, study three consisted of two separate case studies that investigated the effectiveness of a treatment programme integrating EMDR and graded exposure to treat an LMS-affected diver and a yips-affected golfer. Treatment focussed on memories of significant life-events associated with the problem, negative cognitions, anxiety, and avoidance behaviour. Reprocessing these memories using EMDR, and addressing associated symptoms underpinned by anxiety, resulted in the elimination of dysfunctional symptoms, and improved performance in both cases. Consequently, the findings of study three provided further support for a relationship between significant life-events, extreme anxiety, avoidance, and loss of cognitive control associated with development of the yips and LMS, thus supporting the notion that these problems are similar forms of an anxiety-based disorder and should perhaps be re-classified accordingly.

6.3 Discussion

The following section provides a discussion of the main theoretical and practical implications emanating from the three studies. Further consideration of the strengths and limitations of this research programme and future research directions bring this section to a close.

It is thought that only a proportion of individuals who experience a single occurrence of a performance breakdown, characteristic of the yips/LMS, will

subsequently suffer the debilitating longevity of the disorders (Roberts et al., 2013). However, for this proportion of individuals, the escalating effect can be career destroying. The findings of this thesis indicate that this is likely a consequence of an individual's personality characteristics and their appraisal of significant life-events. For example, it has been reported that individuals with higher levels of perfectionism are more prone to the negative effects of daily life-stresses, than those with comparably lower levels of perfectionism (Hewitt et al., 1996; Stoeber & Otto, 2006). Indeed, whilst study two revealed a relationship between perfectionistic concern, perfectionistic striving, and the yips/LMS, the participants also experienced substantial amounts of stress during their yips/LMS experience. This is consistent with research reporting higher levels of perfectionism among individuals who experience higher levels of general anxiety in situations others typically find less stressful (Frost & DiBartolo, 2002). Thus, an individual experiencing the yips/LMS might also be more susceptible to experiencing life-stress as a result of increased levels of perfectionism. The mechanisms underpinning this process remain unclear. However, it has been suggested that the personal standards factor of the Frost multidimensional perfectionism scale might distinguish the way in which an individual reflects their perfectionism (Frost et al., 1990; Frost, 2011). Indeed, individuals who experienced the yips/LMS were higher in the personal standards factor than those who did not, and it might therefore be assumed that individuals suffering from the yips/LMS reflect this aspect of perfectionism in a dysfunctional manner.

Rumination scores were also found to be significantly higher in the yips/LMS groups than matched controls. This might, in part, explain the way in which the frequency and intensity of the yips and LMS tends to escalate. Specifically,

rumination is thought to involve conscious thoughts, images, and/or memories revolving around the causes, symptoms, and consequences of a significant emotional experience (Nolen-Hoeksema, 2000). These cognitions recur without intention, and are typified by an increase in negative affect, coupled with a decrease in positive affect (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008). Thus, resulting in an escalation of anxiety-related symptoms (McLaughlin, Borkovec & Sibrava, 2007). Based upon the findings of studies one and two, it would seem likely that individuals experiencing the yips/LMS also engage in obsessive negative thinking about the problem and associated symptoms, the intensity and severity of which consequently escalate, maintaining the problem. Indeed, rumination has been found to mediate the relationship between perfectionism and anxiety-related disorders, and has a role in maintaining ensuing symptoms (Michael, Halligan, Clark & Ehlers, 2007). Consequently, if perfectionists are more susceptible to experiencing daily life-stress, when coupled with habitual ruminative thinking patterns, and the heightened levels of anxiety involved, it is not surprising that the yips and LMS manifest in the way they do. This is likely exacerbated by the high-levels of reinvestment also reported by both the yips and LMS groups in study two. Indeed, it is feasible to assume that an individual's propensity to reinvest in their actions, combined with perfectionistic tendencies, and prolonged ruminative thought processes, result in the problems becoming ingrained. In contrast, someone without this profile might just pass off an initial performance breakdown as a one-off, and also be more equipped to keep things in perspective.

6.3.1 Conceptualisation of the yips and LMS.

Traditionally, research has suggested choking and dystonia as potential classifications for the yips and/LMS (e.g., Bawden & Maynard, 2001; Smith et al.,

2000; 2003), which have been considered entirely independent phenomena. However, findings from the present research revealed several psychological components associated with both the yips and LMS. These included extreme levels of cognitive and somatic anxiety, hypervigilance, fear, loss of movement control, avoidance behaviour, (and as previously mentioned) increased levels of perfectionism, rumination, and reinvestment. Growing evidence of the underlying psychological components involved, and the marked similarities between the two, suggest that they are in fact one and the same form of psychological problem. Indeed, the current thesis indicates that the yips and LMS are probably similar forms of an anxiety-based disorder, and should therefore be provided a generic classification. One expression that appears to capture the shared experience described by all participants in study one of this thesis is *performance block* (e.g., it's like hitting a wall and you're stuck; everything goes into lock; something just locks and freezes; it's like something's blocking you and you're stuck). These blocks are characterised by a sudden and temporary loss of fine and/or gross motor and cognitive control, manifesting as locked, stuck or frozen movements. Symptoms including intense anxiety, fear, and panic are heightened during an experiential loss of emotional, cognitive, and physical control, and these problems appear to affect previously mastered sports skills with no known trigger.

While causality of the yips and LMS cannot be ascertained from the current research, several participants alluded to the fact that the sudden loss of physical control triggered their emotional response. For example, experiencing extreme levels of fear, panic, and/anxiety as a result of momentary loss of movement control. In contrast, others described losing control of their emotions, experiencing overwhelming levels of fear, anxiety, shock, and panic, followed by severe movement

disruption. In all cases these components were coupled with frustration and anger towards the unpredictable nature of the phenomena, and inability to perform a once automatic movement pattern. Furthermore, all individuals identified that onset of the yips/LMS was both instantaneous and unexpected, again implying the absence of conscious control and involvement of less conscious processes. As mentioned previously, the yips and LMS appear to escalate following initial onset, gradually worsening in frequency at the vulnerability of sufferers who appear powerless to stop it. Considering what we know about the pervasive nature of anxiety, it is likely that this contributes to the escalating nature of the yips and LMS.

Anxiety is said to play a major role in the course of events following a significant life-experience (Scaer, 2014). Specifically, it is thought that previous experience of significant life-events involving psychological, behavioural, and psychophysiological distress, can lead to somatic and/cognitive disturbance years later (Stokes, 2009). Furthermore, research has demonstrated that current environmental stressors can reactivate memories associated with disturbing life-events years after the event occurred, subsequently causing aspects of the initial event to be re-experienced in the form of physical and psychological distress, but without further context (McFarlane & Yehuda, 2000; Shapiro, 2001). This would certainly explain the self-perpetuating nature by which the yips and LMS develop, if, similarly to anxiety disorders, individuals become trapped in a cycle of anxiety experience associated with a past memory, the details of which they are unable to recall.

Difficulty recalling aspects of an event is a common side effect of experiences involving overwhelming levels of emotion (i.e., significant/traumatic events). Specifically, it is thought that the level of emotion attached to these experiences overwhelms the brain's capacity to attend to all incoming stimuli, and therefore

process the event appropriately (Stokes, 2009). Thus, details of the experience remain blocked, and the memory is stored in its raw emotional form, with all of the somatic and emotional intensity of the initial event (Scaer, 2014). Individuals in study one described being unable to visualise execution of the affected skill, and several also reported seeing themselves getting stuck, or only being able to recall certain aspects of the skill. Due to the heightened levels of emotion and distress involved in the yips and LMS, it is perhaps not surprising that participants reported loss of memory and mental blocks.

In conclusion, the overriding factors accompanying the yips and LMS experience are anxiety and the sudden breakdown of a skill that could previously be performed without concern. Contributing factors for these symptoms appear to consist of fear, panic, loss of cognitive control, and varying forms of muscle tension causing further involuntary movements. Moreover, it appears that significant life-events, extreme anxiety, avoidance, and loss of cognitive control, are all associated with the development and treatment of the yips/LMS, supporting the notion that these problems are similar forms of an anxiety-based disorder. This is further supported by the effectiveness of an intervention method originally developed to treat anxiety-disorders. Specifically, it was demonstrated that EMDR and exposure therapy offers an effective treatment for the yips and LMS. Treatment focussed on memories of significant life-events associated with the problem, negative cognitions, anxiety, and avoidance behaviour, which were believed to have contributed to the development and maintenance of these problems. Reprocessing these memories using EMDR, and addressing associated symptoms underpinned by anxiety, resulted in the elimination of dysfunctional symptoms, and improved ability to execute the affected skills in both cases.

6.3.2 Practical implications.

It is clear that the initial perception and interpretation of any significant life-experience is imperative to what follows. Indeed, the present research highlights the importance of sport psychologists considering the impact of significant life-events (sporting or otherwise) on athletic performance. Specifically, whether a significant event is stored as a traumatic memory, or whether it is processed and the emotional content appropriately managed. Both the sport psychologist and coach (participating in study three) highlighted the importance of talking through the physical, cognitive, and emotional experience of a significant-event with an athlete, facilitating processing of the overwhelming emotional content attached to the experience, in a safe environment. Thus, based on the findings of this thesis, it is recommended that relevant personnel (e.g., coaches, performance support team, psychologist) are educated on effective debriefing of significant life-events with athletes, in both the training and competition environments.

The current research has demonstrated that these performance issues also have a negative impact on social functioning (e.g., avoidance towards the affected environment, disturbed sleep, isolation, bouts of depression). This thesis opens the door for education programs to be developed so that coaches and athletes can recognise and understanding these problems better, and subsequently manage the affected environment to promote healing and prevent further distress. Indeed, several athletes reported isolation, confusion, avoidance, and fear associated with not understanding the problem. Thus, educating individuals on appropriate language used in reference to these problems might prevent associated symptoms being further exacerbated.

The current thesis also identified factors that might make athletes susceptible to the yips/LMS. Specifically, individuals suffering from the yips/LMS revealed high levels of perfectionism, rumination, and reinvestment. Hence, some form of assessment of these attributes might be beneficial for practitioners working with elite athletes. Proactively screening individuals for these characteristics might allow for preventative measures to be put in place to help avoid individuals going on to develop the yips/LMS. Furthermore, addressing whether an individual reflects perfectionism in a dysfunctional manner, and exploring the content of ruminative thinking patterns, might also indicate the impact these characteristics have on the development of the yips/LMS. Taking these factors into consideration, educational sessions might be developed to raise awareness of the potential negative impact of perfectionism, and to develop skills such as rationalising, or countering debilitating perfectionistic and/or ruminative thinking patterns.

The findings of this thesis identified the involvement of a sub-conscious component, and that cognitive interventions targeted towards treating the yips and LMS were ineffective. Study three demonstrated that addressing psychological components with EMDR and exposure therapy effectively treated the problems. Based on the unique context of elite sport, several practicalities need to be considered before this type of intervention can be proposed. First and foremost, it appears that the most effective form of treatment for the yips and LMS includes the use of two methods (e.g., EMDR and exposure therapy), one of which (EMDR) is currently outside the realms of traditional sport psychology, and therefore requires clinical expertise. The involvement of a clinical psychologist in the current investigation is testament to this. Specifically, the current research has demonstrated that the prescription of EMDR delivered by a clinical psychologist allowed previous trauma

experience to be processed, subsequently providing relief from symptoms associated with the yips and LMS. Both EMDR therapists involved in this research highlighted the importance of involving an experienced clinician when treating any psychological disorder involving trauma-related symptoms, and that appropriate supervision should be in place throughout treatment. It is therefore advised that clinical experts are involved in the formulation and treatment of these performance difficulties.

The two cases presented in study three emphasised the importance of using treatment plans that are adaptable to individual needs and can be shaped accordingly as treatment progresses. The sport psychologists also spent a significant amount of time with the EMDR therapists prior to each intervention to ensure their understanding of the environment in which they would be operating, and effective integration of each aspect of the interventions. In each case the sport psychologists ensured all individuals involved were kept up to date and informed throughout each stage of treatment. Additional considerations specific to the context include individual training and competition demands. For example, each intervention had to be scheduled in such a way that it did not interfere with the athlete's training load. Indeed, possible side effects of EMDR treatment include emotional and cognitive fatigue (Shapiro & Forrest, 2004), therefore each session was required to precede a period of recovery time for the athlete.

6.4 Conclusions and Recommendations for Future Research

To ensure the most effective treatment methods can be developed, therapists are required to continually examine research data, present new ideas, and challenge existing methods (Beaumont & Hollins Martin, 2013). The current research provides initial indication of an effective treatment for the yips and LMS. Specifically, two case studies appear to indicate that the sub-conscious treatment of these problems

using EMDR and exposure therapy warrant further investigation. Thus, it is recommended that future research investigates the preliminary findings presented here, perhaps using multiple baseline measurements to assess the individual contributions of EMDR and exposure therapy, and to explore additional treatment methods that could perhaps be delivered by sport psychologists.

This study supports the growing evidence suggesting EMDR is a fast and effective treatment method for processing emotional and/or traumatic memories, and that addressing the major emotional component involved in the yips and LMS facilitates performance improvement. Whilst the design of the current study makes comparison of each treatment element difficult, it does provide a rationale for exploring the role of EMDR in more depth. For example, when considering the efficacy of exposure therapy, coupled with the importance of teaching sufferers not to be afraid of stimuli associated with a problem (Foa, 1997), it is possible that the exposure element of EMDR offers the essential component (Deville & Spence, 1999). Indeed, the effects of EMDR might be a result of exposure facilitating naturally occurring in vivo exposure. It is therefore recommended that further research explore the different contributions of each aspect of EMDR treatment in an attempt to isolate the effective elements of the treatment.

Finally, it is recommended that future research look to examine the prevalence of these problems in other sports to establish if athletes experience similar symptoms to those presented in this thesis. For example, it might be that individuals in other sports experience the same psychological, emotional, and behavioural symptoms associated with the yips and LMS, and that the physical manifestation affects the muscles involved in execution of the affected skill (e.g., finger spasms in shooting, fore-arm/wrist muscles in racquet sports). Indeed, previous research has referred to

movement disruption in sports such as archery (Thomas, 2008), darts (Rotheram et al., 2007), and baseball (Hooke, 2005). However, the majority of these reports are anecdotal and lack scientific research evidence, and it is therefore recommended that future research investigate these further.

6.4.1 Thesis limitations.

Although the results of the two case studies were profoundly important, by the very nature of the single case-study design, the results cannot be generalised to larger populations. One cannot rule out the possibility that the success of each intervention was a result of individual differences, exceptional personal histories, or indeed the unique context within which elite sport is placed. Furthermore, because this study involved the application of two treatment methods in the intervention (e.g., EMDR and exposure treatment), it cannot be ascertained which method yielded most success in alleviating specific components of the problems addressed. However, the use of objective measures, a formal treatment fidelity protocol, and the use of different therapists for each case study (sport psychologists and EMDR therapists), all assisted in decreasing this threat to validity. Furthermore, the aim of study three was to provide an effective treatment method for the yips and LMS, and not to directly compare the benefits of EMDR in comparison to exposure treatment for this aim.

6.5 Summary and Concluding Remarks

Before the commencement of this programme of research, the yips and LMS had been considered two entirely distinct performance issues, and there was yet to be an effective treatment method developed. Thus, the purpose of the current thesis was to delineate these problems so that detailed diagnostic criteria can be developed and more effective treatment methods provided. Triangulation through the use of qualitative and quantitative methods allowed for a holistic exploration of the

underlying components and mechanisms of these disorders and their appropriate treatment, thus providing contributions to the literature that have not previously been addressed. As a result of this thesis we are now much closer to understanding the pathology of these issues and therefore their appropriate diagnosis.

This thesis posits that the yips and LMS are similar forms of an anxiety-based disorder, and that they are perhaps caused by significant life-events combined with increased levels of perfectionism, rumination, and reinvestment. These problems appear to manifest in a sudden and temporary loss of fine, and/or gross motor and cognitive control, and locked, stuck, or frozen movements. Additional symptoms include intense anxiety, fear, and panic, coupled with somatic anxiety symptoms, all of which are heightened during an experiential loss of control, affecting previously mastered sports skills. Furthermore, this thesis has shown that EMDR with exposure therapy offers an effective treatment for the yips and LMS. As such, it is proposed that the yips and LMS are reclassified as similar forms of an anxiety-based disorder under the generic classification *performance blocks*. The fundamental component of performance blocks is anxiety, combined with perfectionism, rumination, reinvestment, and significant life-events, and it is recommended that treatment consist of EMDR with exposure therapy.

These findings have huge implications for sport. Firstly, the language associated with these problems ought to be reconsidered towards the generic classification performance block. Second, education programmes should be developed so that coaches, athletes, and sport psychologists can have a better understanding of these problems, and therefore more effectively manage the athletes environment to promote healing and avoid exacerbating symptoms. Third, the current research suggests that individuals with high levels of perfectionism, rumination, and

reinvestment might be more vulnerable to developing these performance issues, and therefore it is recommended preventative measures are developed to address the maladaptive impact of these characteristics, and protect individuals from developing these problems. Finally, if sport psychologists are to address performance blocks it is recommended that further training be provided on the pathology of these problems, and that treatment involves a collaborative approach between sport psychologist and clinical psychologist as a minimum.

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Timeline of Thesis

Date	PhD
June 2013	Study 1 proposal, ethics and participant recruitment
July	Carry out pilot studies
Aug	Study 1 data collection
Sep	
Oct	Study 1 data analysis
Nov	
Dec	
Jan 2014	Study 1 write up
Feb	
March	RF2 and study 2 proposal
April	Study 2 data collection
May	
June	Study 2 data analysis
July	Study 2 write up
Aug	
Sep	Study 3 proposal
Oct	Study 3 data collection
Nov	
Dec	
Jan 2015	
Feb	
March	
April	
May	
June	
July	
Aug	Thesis write up and RF3
Sep	
Oct	
Nov	Viva
Dec	
Jan 2016	
Feb	
March	
April	
May	
June	

**Faculty of Health and Wellbeing
Research Ethics Committee**

Sport & Exercise Research Ethics Review Group

APPLICATION FOR ETHICS APPROVAL OF RESEARCH

In designing research involving humans, principal investigators should be able to demonstrate a clear intention of benefit to society and the research should be based on sound principles. These criteria will be considered by the Sport and Exercise Research Ethics Review Group before approving a project. **ALL** of the following details must be provided, either typewritten or word-processed preferably at least in 11 point font.

Please either tick the appropriate box or provide the information required.

1) Date of application	11 th July 2013
2) Anticipated date of completion of project	Jan 2014
3) Title of research	Yips and lost move syndrome: exploring psychological symptoms, parallels, and implications for treatment.
4) Subject area	Psychology
5) Principal Investigator	
Name	Jennifer Bennett
Email address @ SHU	Jebenne2@my.shu.ac.uk
Telephone/Mobile number	07853 155125
Student number (if applicable)	14001865
6) State if this study is: (If the project is undergraduate or postgraduate please state module name and number)	<input checked="" type="checkbox"/> Research <input type="checkbox"/> Undergraduate <input type="checkbox"/> Postgraduate Module name: Module number:

7) Director of Studies/Supervisor/ Tutor name	Prof Ian Maynard
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8) Intended duration and timing of project?	6 months start July 2013
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9) Location of project If external to SHU, provide evidence in support (see section 17)	SHU and English Institution of Sport (EIS) Sheffield
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10) State if this study is:	<input checked="" type="checkbox"/> New <input type="checkbox"/> Collaborative (please include appropriate agreements in section 17) <input type="checkbox"/> Replication of :
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11) Purpose and benefit of the research Statement of the research problem with any necessary background information (no more than 1 side of A4)

Reference to various performance problems resulting in the long-term loss of a skill once performed automatically, have appeared in the sport psychology literature under a number of disparate labels and terms, often used interchangeably. For example, 'yips' (Bawden & Maynard, 2001), lost move syndrome (LMS) (Day, Thatcher, Greenless & Woods, 2006), repetitive performance problems (RPP) (Grand & Goldberg, 2011), performance phobias (Silva, 1994), and focal dystonia (Smith, Malo, Laskowski, Sabick, ... & Kaufman, 2000; 2003) have all been considered examples of such hijacks. Further, recent research has outlined several commonalities between the symptoms associated with 'yips', LMS, performance phobias and focal dystonia, proposing that they are indeed the same problem under different labels (Day et al., 2006; Rotherham, Maynard, Thomas, Bawden & Francis, 2012).

Whilst many of these problems have traditionally been considered psycho-neuromuscular impediments (Smith et al., 2000) or a physical problem made progressively worse by stress (Sachdev, 1992), recent research has directed attention towards the underlying psychological causes (Bawden & Maynard, 2001; Rotherham et al, 2012). Rotherham and colleagues (2012) discussed possible psychological foundations underlying the physiological symptoms of unwanted behavioural responses (e.g., freezing or muscular spasms). Interestingly, the authors suggested that the yips were also associated with the experience of significant life events away from the sporting context,

which later triggered symptoms such as physical freezing, coupled with the inability to perform previously automatic movements (Grand & Goldberg, 2011; Rotherham et al, 2012; Solomon & Shapiro, 2008). Indeed, within their study exploring the yips in golf, Rotherham and colleagues (2012) demonstrated that the yips were associated to a chain of such significant life events (e.g. traumatic experiences), and not, as previously assumed, the result of sport performance itself. Despite this, research is yet to provide detailed diagnostic criteria, psychological symptomatology, aetiology, and applied interventions to overcome such performance problems in sport.

The aim of the current programme of research is to establish whether performance blocks, specifically the yips and LMS, share similar psychological symptoms and should therefore be considered using the same classification. A second aim is to explore whether the symptoms of such sports performance problems also share commonalities with recognised trauma spectrum disorders (e.g., PTSD), and as such might be resolved using less conscious intervention methods, originally developed for the treatment of these. This is with the intention of producing a framework that can be used in the applied setting to diagnose when an individual is experiencing a recognised psychological performance problem, and subsequently match an appropriate less conscious therapy to overcome it.

Due to limited understanding of the links between various performance problems in sport, study one will seek to identify commonalities between the psychological symptoms of two performance problems, specifically the yips and LMS. It is hypothesised that this will guide the potential reconceptualisation of such problems, demonstrating a need to recognise them under the same banner. Second, it is hoped diagnostic criteria and a shared classification of these problems can be presented. Determined by the results generated from this initial study, later studies will seek to explore potential links between these performance problems in sport and similar problems experienced outside of sport, thus revealing potential treatment methods. Following this it is hoped that the program will explore the application and potential modification of less conscious interventions currently used to treat other recognised disorders, for the treatment of performance problems in the sporting context.

12) Participants	
12.1 Number	16 (8 participants with Yips, 8 participants with LMS)
12.2 Rationale for this number (eg calculations of sample size, practical considerations)	Sample size is deemed appropriate according to previous research and requirements for reliable qualitative research (Day et al., 2006; Rotherham et al., 2013; Patton, 2002).
12.3 Criteria for inclusion and exclusion (eg age and sex)	Athletes are required to either be

	<p>currently experiencing yips or LMS that has been unsuccessfully addressed at the conscious level (i.e., using CBT/ talk therapy/ behaviour change techniques), or have retired from sport and have experienced one/ or several episodes of yips or LMS while they were competing at a high level. Specifically, they will/ or had present(ed) breakdown of a specific skill that had once been performed with ease (see Day et al., 2006 for full LMS criteria and Rotherham et al., 2013 for full Yips criteria). All participants will have been referred by a sport psychologist or coach and considered to be experiencing yips or LMS. Participants will be over 18 years of age.</p>
<p>12.4 Procedures for recruitment (eg location and methods)</p>	<p>Athletes will be recruited via purposive sampling (Patton, 2002), in order to assure participants selected are the most appropriate in terms of answering the question being addressed (Fletcher, 2012). Due to the nature of the PhD, and the intention of developing a framework that can be applied to every individual, participants included throughout the thesis will span a range of sports.</p> <p>All information generated will be stored in password-protected files accessible to the primary research team only. If participants need to be contacted again in the future, e.g. to clarify on a point made in an earlier interview, the ethics committee will be approached prior to any contact with further participants that were not identified in the original submission</p>

	<p>(Holt & Tamminen, 2010).</p> <p>In order to identify athletes experiencing yips or LMS, sport psychologists and coaches will be contacted via phone, email, and face-to-face and asked to identify athletes with their consent. Following this, those athletes who consented to be identified and contacted, will be contacted via email, phone or face-to-face as opportune, and upon agreement to participate, will be sent an information letter detailing what participation in the study will entail and further information about the aims of the research (see Appendix 2). Informed consent will also be sought prior to data collection (see Appendix 1), and participants will be reminded that all data will remain anonymous and that participation is voluntary. Finally, participants will be made aware they are entitled to withdraw from participation at any time with no notice and that if requested data related to them will not be used. Upon agreement to participate the principal investigator will arrange a convenient date, time and location for the interview to take place.</p>
<p>12.5 Does the study have *minors or †vulnerable adults as participants?</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p>12.6 Is CRB Disclosure required for the Principal Investigator? (to be determined by Risk Assessment)</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If yes, is standard <input type="checkbox"/> or enhanced <input type="checkbox"/> disclosure required?</p>
<p>12.7 If you ticked 'yes' in 12.5 and 'no' in 12.6 please explain why:</p>	

*Minors are participants under the age of 18 years.

‡Vulnerable adults are participants over the age of 16 years who are likely to exhibit:

- a) learning difficulties
- b) physical illness/impairment
- c) mental illness/impairment
- d) advanced age
- e) any other condition that might render them vulnerable

13) Details of the research design

13.1 Provide details of intended methodological procedures and data collection.

(For MSc students conducting a scientific support project please provide the following information: a. needs analysis; b. potential outcome; c proposed interventions).

It has been established that qualitative enquiry based upon responses to open ended questions permit one to understand the world as seen by the respondents (Patton, 2002). Thus, participants will be questioned using a semi-structured interview guide developed using existing literature (see Appendix 3). Interviews will be conducted by the principle researcher. In order to measure the appropriateness of the interview guide and check that the questions are comprehended, a number of pilot studies will be conducted. Based on the information received from these initial pilot studies, the interview guide will be revised and amended accordingly. Following this, data collection for study one will take place and interviews will be digitally recorded by the principle researcher. The interviews will be guided by a semi-structured interview schedule and so it is expected that the majority of discussion will be participant led.

13.2 Are these "minor" procedures as defined in Appendix 1 of the ethics guidelines?

Yes No

13.3 If you answered 'no' in section 13.2, list the procedures that are not minor

13.4 Provide details of the quantitative and qualitative analysis to be used

In order to establish potential commonalities between symptoms experienced by athletes during yips, and symptoms experienced by athletes during LMS, the information generated through the above interview process will be analysed using thematic analysis. Specifically, thematic analysis will be utilised to highlight recurring themes reported and match them to those generated from existing literature (Braun & Clarke, 2006). Following this process, the relationship between common themes will be considered and a summary provided outlining identified associations. Member checking procedures will be followed in order to ensure that the results reported provide an accurate representation of participants intended meaning. This will require participants to review the data generated from the study and suggest amendments if necessary (Lincoln & Guba, 1985).

<p>14) Substances to be administered (refer to Appendix VI of the ethics procedures)</p> <p>14.1 The protocol does not involve the administration of pharmacologically active substances or nutritional supplements.</p> <p>Please tick box if this statement applies and go to section 15) [X]</p> <p>14.2 Name and state the risk category for each substance. If a COSHH assessment is required state how the risks are to be managed.</p>

<p>15) Degree of discomfort that participants might experience</p> <p>Consider the degree of physical and psychological discomfort that will be experienced by the participants. State the details which must be included in the participant information sheet to ensure that the participants are fully informed about any discomfort that they may experience.</p>
<p>See participant information sheet.</p>

<p>16) Outcomes of Risk Assessment</p> <p>Provide details of the risk and explain how the control measures will be implemented to manage the risk.</p>

17) Attachments	Tick box
17.1 Risk assessment (including CRB risk assessment)	X
17.2 COSHH assessment	NA
17.3 Participant information sheet (this should be addressed directly to the participant (ie you will etc) and in a language they will understand)	X
17.4 Informed consent form	X
17.5 Pre-screening questionnaire	NA
17.6 Collaboration evidence/support correspondence from the organisation consenting to the research (this must be on letterhead paper and signed) See sections 9 & 10.	NA

17.7 CRB Disclosure certificate <u>or</u> where not available CRB application form	NA
17.8 Clinical Trails form (FIN 12)	NA

<p>18. Signature Principal Investigator</p>	<p>Once this application is approved, I will undertake the research study as approved. If circumstances necessitate that changes are made to the approved protocol, I will discuss these with my Project Supervisor. If the supervisor advises that there should be a resubmission to the Sport and Exercise Research Ethics Review Group, I agree that no work will be carried out using the changed protocol until approval has been sought and formally received.</p> <p style="text-align: center;">Jennifer Bennett Date 11th July 2013 Principal Investigator signature</p> <p>Name Miss Jennifer E Bennett</p>
<p>19. Approval Project Supervisor to sign either box A or box B as applicable</p> <p>(refer to Appendix I and the flowchart in appendix VI of the ethics guidelines)</p>	<p>Box A: I confirm that the research proposed is based solely on 'minor' procedures, as outlined in Appendix 1 of the HWB Sport and Exercise Research Ethics Review Group 'Ethics Procedures for Research with Humans as Participants' document, and therefore does not need to be submitted to the HWB Sport and Exercise Research Ethics Review Group.</p> <p>In terms of ethics approval, I agree the 'minor' procedures proposed here and confirm that the Principal Investigator may proceed with the study as designed.</p> <p style="text-align: center;"><i>I. W. Agard</i> ----- Date 12.07.13 Project Supervisor signature</p> <p>Name -----</p>
	<p>Box B: I confirm that the research proposed is <u>not</u> based solely on 'minor' procedures, as outlined in Appendix 1 of the HWB Sport and Exercise Research Ethics Review Group 'Ethics Procedures for Research with Humans as Participants' document, and therefore <u>must</u> be submitted to the HWB Sport and Exercise Research Ethics Review Group for approval.</p> <p>I confirm that the appropriate preparatory work has been undertaken and that this document is in a fit state for submission to the HWB Sport and Exercise Research Ethics Review Group.</p> <p style="text-align: center;">----- Date ----- Project Supervisor signature</p> <p>Name -----</p>
<p>20. Signature Technician</p>	<p>I confirm that I have seen the full and approved application for ethics approval and technical support will be provided.</p> <p style="text-align: center;">----- Date ----- Technician signature</p> <p>Name -----</p>

INFORMED CONSENT FORM

TITLE OF PROJECT: Yips and lost move syndrome: exploring psychological symptoms, parallels, and implications for treatment

The participant should complete the whole of this sheet himself/herself

Have you read the Participant Information Sheet?	YES/NO
--	--------

Have you had an opportunity to ask questions and discuss this study?	YES/NO
--	--------

Have you received satisfactory answers to all of your questions?	YES/NO
--	--------

Have you received enough information about the study?	YES/NO
---	--------

To whom have you spoken?	
-----------------------------------	--

Do you understand that you are free to withdraw from the study:	
---	--

• at any time	YES/NO
---------------	--------

• without having to give a reason for withdrawing	YES/NO
---	--------

• and without affecting your future medical care	YES/NO
--	--------

Have you had sufficient time to consider the nature of this project?	YES/NO
--	--------

Do you agree to take part in this study?	YES/NO
--	--------

Signed	Date
--------------	------------

(NAME IN BLOCK LETTERS).....

Signature of Parent / Guardian in the case of a minor

.....

FOR USE WHEN STILL OR MOVING IMAGES WILL BE RECORDED

Consent to scientific illustration

I hereby confirm that I give consent for photographic and/or videotape and sound recordings (the 'material') to be made of me. I confirm that the purpose for which the material would be used has been explained to me in terms which I have understood and I agree to the use of the material in such circumstances. I understand that if the material is required for use in any other way than that explained to me then my consent to this will be specifically sought.

1. I understand that the material will form part of my confidential records and has value in scientific assessment and I agree to this use of the material.

Signed..... Date.....

Signature of Parent / Guardian in the case of a minor

.....

2. I understand the material has value in teaching and I consent to the material being shown to appropriate professional staff for the purpose of education, staff training and professional development.

Signed..... Date.....

Signature of Parent / Guardian in the case of a minor

.....

I hereby give consent for the photographic recording made of me on..... to be published in an appropriate journal or textbook. It is understood that I have the right to withdraw consent at any time prior to publication but that once the images are in the public domain there may be no opportunity for the effective withdrawal of consent.

Signed Date

Signature of Parent / Guardian in the case of a minor

.....

It has been made clear to me that, should I feel that these Regulations are being infringed or that my interests are otherwise being ignored, neglected or denied, I should inform Mr David Binney, Chair of the Faculty of Health and Wellbeing Research Ethics Committee (Tel: 0114 225 5679) who will undertake to investigate my complaint.

Project Title	Yips and lost move syndrome: exploring psychological symptoms, parallels, and implications for treatment
Supervisor/Director of Studies	Ian Maynard
Principal Investigator	Jennifer Bennett
Principal Investigator telephone/mobile number	07853155125 jen.bennett@eis2win.co.uk

Purpose of Study and Brief Description of Procedures *(Not a legal explanation but a simple statement)*

The purpose of this study is to explore the psychological experience and symptoms associated with the experience of yip and lost move syndrome (LMS) in sport.

Participants will be required to partake in a semi-structured interview conducted by the principal investigator, at a suitable time and location. The interviews will last approximately 45-60 minutes and will be digitally recorded in order for the principal investigator to transcribe the interviews accurately.

Participation is voluntary and you have the right to withdraw from the study at any time. Data will solely be used for the purpose outlined above, however there is potential for the study to be published in an academic journal. All information and data will remain anonymous and participants will be assigned pseudonyms in the written report of the data. All data will be kept on a secure, password protected computer and written copies will be locked in a drawer.

**Faculty of Health and Wellbeing Research Ethics Committee
Sport and Exercise Research Ethics Review Group**

Risk Assessment Pro Forma

****Please ensure that you read the accompanying
Risk Assessment Risk Ranking document before completing this form****

Title of research	Yips and lost move syndrome: exploring psychological symptom parallels, and implications for treatment.
--------------------------	---

Date Assessed	10 th July 2013
----------------------	----------------------------

Assessed by (Principal Investigator)	J Bennett
---	-----------

Signed	Position
J Bennett	Principal Investigator

Activity	Risks	Control Measures
Put in this box the activity which may cause harm.	Risk of [place in here the harm that may be caused] caused by [put in the hazard (source of danger) here]. Risk = consequence x likelihood. Identify risk category Low Medium or High	Place here what you would do to minimise the risk
One to one interviewing	Risk by consequence: interviews resulting in minor distress no counselling required. R = 1 = Low	Monitor and cross check participant comfort throughout the interview.

Risk Evaluation (Overall)
R=1 Low

General Control Measures

Is a pre-screen medical questionnaire required? Yes [] No [X]
--

Emergency Procedures

Counselling referral available

Monitoring Procedures

Cross checking participant comfort throughout the interview procedure. Maintaining confidentiality and participant well being throughout the study.

Review Period

Per study

Reviewed By (Supervisor)

Date

--	--

Study 1: Yips and Lost Move Syndrome: Exploring psychological symptoms, parallels and implications for treatment.

Interview schedule

Exploring the concept, definition, sources and type of performance problem

1) Please can you describe to me what your experience of (Yips/LMS) was/is?

Specific probe questions:

- How did it start?
- How did it develop?
- How long have you been experiencing/ did experience this problem?
- Do you think you know what has caused it?
- Do you experience it in one/ many environments?
- Can you *describe* to me what it was *like* (emotionally and physically)?
- Can you compare it to any other experiences you have had?
- How in control did you feel?

Before moving onto the next section is there anything else you would like to add?

Emotional experience

2) Please can you tell me about the emotions you do/did experience at the time?

- Have you experienced these emotions in another context?
- What was it like?

3) Can you tell me about what you do/were thinking about at the time?

Before moving onto the next section is there anything else you would like to add?

Felt experience

4) Can you describe to me how the experience makes/made you feel physically?

- What was it like?
- How long does/did this feeling last?
- Have you had this feeling in any other contexts (previously and/or since)?

Before moving onto the next section is there anything else you would like to add?

Secondary experiences

4) Have you had similar repeated experiences?

- How did you feel emotionally?
- How did you feel physically?
- What were/ are you thinking about at the time?

- Was the environment the same/ different?

Before moving onto the next section is there anything else you would like to add?

Emotional effects/ response to

5) Have/did you experience(d) flashbacks specifically related to the experience?

- Other emotional side effects?
- Do you think about the experience at night?
- Do/ can you visualise the experience now/ previously?

6) Please can you describe how you do/did feel physically when you think about the experience?

- How anxious do you feel?
- Do you have similar feelings in other contexts?
- Can you describe what it is like?

7) How do you feel when you are back in the environment it happened?

- Do/did you avoid the environment in which it happens(ed)?

Before concluding the interview is there anything else you would like to add?

That just about brings us to the end of the interview; however, before we finish there are a couple more questions I would like to ask you.

1. Are there any areas that you think I might not have covered relating to your performance problem in sport?
2. Do you think I led, or influenced your answers away from the things you wanted to discuss?
3. Do you think the interview could be improved in any way?

Thank you I think that's everything I wanted to ask you, is there anything you would like to ask me or anything else you would like to add?

Many thanks for your time and involvement in this interview.

Interview cover sheet

Jenn Bennett

English Institute of Sport (EIS) Sheffield | Coleridge Road | Sheffield | S9 5DA
The Centre for Sport and Exercise Science | Collegiate Crescent Campus | Sheffield | S10
2BP
jen.bennett@eis2win.co.uk

Participant details

Name:

Age:

Gender:

Address:

E-mail:

Telephone number(s):

Sport:

Event(s)/Position(s):

Number of years competing:

Current level of competition (please state if retired):

Number of years at this level:

Highest performance level:

Major achievements:

Time spent working with sport psychologist (if applicable):

Interview start time:

Interview end time:

Stage 1. Raw data theming

Global dimension: Emotion

Higher order theme: Fear (8LMS, 5YIPS)

Raw data sub-themes:

Terror (1LMS, 1YIPS)

"It's horrific" (YIPSNM)

"it's terrifying your absolutely tearing yourself to bits" (YIPSNM)

"It's just like terrifying a shock to the system" (LMSLT)

"What we're talking about here is just traumatic its not what you want to be doing" (LMSLT)

Dread (1LMS, 2YIPS)

"I'm getting absolute dread and the sinking feeling each time I'm going back to my mark and just desperately trying to get through to the end of the over" (YIPSNM)

"I was dreading every game dreading Saturday coming around" (YIPSNM)

"I'd start to overthink it and dread it" (LMSIS)

"Dread of missing a short putt" (YIPSMRi)

"Dread magnifies itself up" (YIPSMRi)

Scared (5LMS, 3YIPS)

"I'm so scared its really scary" (LMSIS)

"I'm scared its so overpowering...so scary...so scared at that point you don't care what other people are thinking it's the emotions you know so scared in yourself" (LMSHS)

"You feel the same sort of scared every time it happens" (LMSHS)

"I was just really scared....scared to even bounce" (LMSGH)

"Horrible just so scary" (LMSGH)

"Its just scary....really scary and unnerving" (LMSEJ)

"Its scary not being in control" (LMSEJ)

"It feels scary really scary" (LMSRP)

"In your head you get so scared I don't want to feel that scared again" (LMSIS)

"Scary" (YIPSMB)

"Scared and anxious" (YIPSAR)

"I'm scared to run into bowl" (YIPSAR)

"Like when you're younger and you've done something wrong and you're scared of what's going to happen" (YIPSAR)

"It's a scary thing to go ooo you know I'm not in control of my body" (YIPSAS)

Fear (6LMS, 3YIPS)

"Fear of the skill...fear of the skill going wrong fear of coming down not knowing where you are" (LMSDG)

"Fear of it happening" (LMSIS)

"Fear just utter fear when you're in it" (LMSPG)

"Fear when it happens and fear of what happened" (LMSGH)

"Huge fear factor comes in there" (LMSEJ)

"You just feel fear because you're not in control and that's the most scary thing" (LMSRP)

"That fear...I think it was more of a thought because I felt it in my head" (LMSGH)

"You just feel fear because you cant control yourself" (LMSRP)

"Like people that are suffering from phobias" (YIPSAS)

"Frightening" (YIPSMB)

"Too frightening to remember" (YIPSMB)

"Frighten me to death" (YIPSMB)

"I definitely was in extreme anxiety extreme fear" (YIPSMB)

"Frightened of making a mess of it" (YIPSMRi)

"The primary emotion is fear so that fear can be derived from a number of things missing the putt obviously urm...people watching you...you cant deal with pressure" (YIPSAS)

"Fear of losing control of your body...fear of failing urm all those sorts of things sort of come you know cone together in just fear" (YIPSAS)

"You're just kind of being governed by fear I think" (YIPSAS)

"A bit like a fear of spiders" (YIPSAS)

"I think it probably just is genuine fear" (YIPSAS)

"It's a phobia really I think it's a phobia" (YIPSAS)

"It's the fear" (YIPSAS)

"I think its driven by fear" (YIPSAS)

"It's worse at the beginning of a round so you know right at the start of a round I would as I approach the green it would start building" (YIPSAS)

Global Dimension: Emotion

Higher order theme: Panic (4,3)

Raw data sub themes:

Panic (3LMS, 3YIPS)

"It was panic thinking what am I gonna do what am I gonna do to get there" (YIPSNM)

"Panic sets in....I'm doing too many somersaults as I panic" (LMSDG)

"You dare yourself to go but you're panicking" (LMSDG)

"Panic sets in as you startpanic of even doing the skill panic of it going wrong" (LMSDG)

"I'm panicking" (LMSIS)

"I would be in a state of panic" (LMSLT)

"Each time was that panic freeze panic" (LMSLT)

"Its unsettling I'd use the words panic and trauma" (LMSLT)

"I went into panic string freeze mode so quickly" (YIPSMB)

"You're in an extreme state of panic" (YIPSMB)

"Definitely a panicky feel" (YIPSAS)

"It's like ooo panic panic panic" (YIPSAS)

"The feeling of panic and the wanting to get it over with quickly and you know trying to stem the panic" (YIPSAS)

"I just think you panic again" (YIPSAS)

"The panicky feeling I just don't think there's ways of managing that particularly" (YIPSAS)

"Trying to work it all out when you're in a state of panic" (YIPSMB)

"If I know I've got a short putt that I have to make then you know I think I can feel myself get a bit panicky" (YIPSAS)

Freaked out (3LMS)

"it's a total freak out" (LMSLT)

"It was a complete freak out on the take off in front of the headlights the freeze the oooo" (LMSLT)

"I'm freaking out" (LMSIS)

"I would be completely freaked out by it" (LMSLT)

"Freaking out....i'm freaking out" (LMSLT)

"It really freaked me out" (LMSGH)

"Getting to the going where I freaked out so much" (LMSIS)

Global Dimension: Emotion

Higher order theme: Shock (2,1)

Raw data sub themes:

Shock (2LMS, 1YIPS)

"When it happens its like shock....these blips like they really shake you" (LMSLT)

"It feels like a shock" (LMSRP)

"Shell shocked" (YIPSMB)

Global Dimension: Emotion

Higher order theme: Trapped (2,1)

Raw data sub themes:

Trapped (2LMS, 3YIPS)

You're trapped there on the pitch you've got 5 more balls to get through before you can even think about it being over you can't run away and hide from it" (YIPSNM)

"Trapped in absolute hell" (YIPSNM)

"Almost like being trapped in front of headlights" (LMSLT)

"Feeling trapped" (LMSIS)

"I was just like trapped" (YIPSMB)

"Like being trapped inside a burning building not being able to get out you cant bowl I don't know how to get the ball out" (YIPSMB)

"I cant sort of run away from the fact" (YIPSAS)

Sheffield Hallam University

Faculty of Health and Wellbeing
Research Ethics Committee

Sport & Exercise Research Ethics Review Group

APPLICATION FOR ETHICS APPROVAL OF RESEARCH

In designing research involving humans, principal investigators should be able to demonstrate a clear intention of benefit to society and the research should be based on sound principles. These criteria will be considered by the Sport and Exercise Research Ethics Review Group before approving a project. **ALL** of the following details must be provided, either typewritten or word-processed preferably at least in 11 point font.

Please either tick the appropriate box or provide the information required.

1) Date of application	20 th January 2014
2) Anticipated date of completion of project	April 2014
3) Title of research	Yips and lost move syndrome: Assessing impact and exploring levels of perfectionism rumination and reinvestment.
4) Subject area	Sport Psychology
5) Principal Investigator	
Name	Jennifer Bennett
Email address @ SHU	Jebenne2@my.shu.ac.uk
Telephone/Mobile number	07853 155125
Student number (if applicable)	14001865
6) State if this study is: (If the project is undergraduate or postgraduate please state module name and number)	<input type="checkbox"/> Research <input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Postgraduate Module name: Project Module number: 19-7X51-01C-A-20134

7) Director of Studies/Supervisor/ Tutor name	Prof Ian Maynard
--	------------------

8) Intended duration and timing of project?	4 months start January 2014
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9) Location of project If external to SHU, provide evidence in support (see section 17)	Sheffield
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10) State if this study is:	<input checked="" type="checkbox"/> New <input type="checkbox"/> Collaborative (please include appropriate agreements in section 17) <input type="checkbox"/> Replication of :
------------------------------------	--

11) Purpose and benefit of the research
Statement of the research problem with any necessary background information (no more than 1 side of A4)

Reference to various performance problems resulting in the long-term loss of a skill once performed automatically, have appeared in the sport psychology literature under a number of disparate labels and terms, often used interchangeably. For example, the 'Yips' (Bawden & Maynard, 2001), Lost Move Syndrome (LMS; Day, Thatcher, Greenless & Woods, 2006), performance phobias (Silva, 1994), and focal dystonia (Smith, Malo, Laskowski, Sabick, ... & Kaufman, 2000; 2003) have all been considered examples of such problems. Whilst many of these problems have traditionally been considered psycho-neuromuscular impediments (Smith et al., 2000), or a physical problem made progressively worse by stress (Sachdev, 1992), recent research has directed attention towards the underlying psychological causes (Bawden & Maynard, 2001; Rotherham et al., 2012). For example, Rotherham and colleagues (2012) explored the psychological foundations underlying the physiological symptoms of unwanted behavioural responses (e.g., freezing or muscular spasms). Characteristics they outlined included increased fear, anxiety, and negative thoughts. Research has also illustrated those individuals suffering these problems report similar characteristics of the experience, independent of sport (Rotherham et al., 2007). For example, perfectionism, locked thought processes, obsessive thought patterns, reinvestment, and intrusive thoughts related to the experience (Rotherham et al., 2012). Interestingly, these studies have also suggested there might be similarities between the psychological symptoms related to these phenomena, and those reported by individuals exposed to trauma, and subsequently suffering anxiety disorders, many of who develop Post-Traumatic Stress Disorder (PTSD).

Perfectionism, cognitive-rumination, and reinvestment, are psychological processes shown to be elevated across a range of anxiety related disorders (Egan et al., 2011; 2013). Recent research in sport has shown that individuals experiencing the yips have elevated levels of maladaptive perfectionism, obsessional thinking, and self-consciousness (Rotherham et al., 2012). In addition to this, Rotherham et al. (2007) found through a questionnaire-based study, that yips-affected athletes had an increased tendency both to consciously control (reinvest in) their movements, and to be perfectionistic. The authors suggested that high levels of self-consciousness in those who experienced the yips made it more likely that they would reinvest in their actions, and thus be more prone to performance failure (Masters, 1992). Similar findings have emerged in LMS research. Day et al. (2006) found that participants reported over analysis of the skill and negative reactions towards both the skill and others talking about the skill. In addition, participants noted

excessive thoughts about the mechanical aspects of the skill, which in turn led to over-analysis.

Not only has perfectionism been linked to the anxiety disorder 'Obsessive Compulsive Disorder' (OCD; Jones, 1998; Pitman, 1987). A recent review also identified perfectionism as a risk, and maintaining factor, across numerous anxiety disorders (Egan et al., 2011). Psychoanalytical theorists have emphasised notions of perfectionism in their descriptions and theoretical accounts of patients suffering from OCD, defined as "recurrent and persistent thoughts, impulses, or images that are experienced, at some time during the disturbance, as intrusive and inappropriate and that cause marked anxiety or distress" (APA; DSM-V, 2013). Due to the intolerant persistence of the yips and LMS, most of those affected will tend to avoid the activity, change their grip or posture, or omit the move from their routine in order to gain relief from their symptoms. Further, some yips and LMS-affected sufferers will literally make it their obsession to try and overcome the problem, becoming fixated on in every area of their life. One possible explanation for this is the suggestion that perfectionism is the basis for most psychopathologies (Beck, Emmerly & Greenberg, 1985) and so if, as research suggests, the yips and LMS are indeed psychological problems, one might expect higher levels of perfectionism and obsessionality in affected individuals. Furthermore, research has demonstrated higher tendencies towards perfectionism in depression, panic disorder, social phobia and PTSD (Egan et al., 2013; Egan, Wade & Shafran, 2011). Recent investigations have adopted the widely used Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990) to measure maladaptive perfectionism, as it is regarded as internally consistent, reliable over time and displays concurrent validity (Egan et al., 2013; Enns & Cox, 2002; Rotherham et al., 2013). Specifically, Roberts and colleagues (2013) demonstrated higher levels of perfectionism in a sample of 60 individuals experiencing the yips who completed the FMPS. Additional research has also reported an association between perfectionism and PTSD using the 'personal standards' (PS) and 'concern over mistakes' (CM) subscales of the FMPS. The current study will also adopt the PS and CM subscales of the FMPS (see Appendix 4) to measure perfectionism, as these are most closely linked to the clinical definition of perfectionism (Shafran & Mansell, 2011).

Cognitive rumination has not only been shown to be elevated in PTSD-sufferers and other anxiety disorders (Egan et al., 2013; Ehring & Watkins, 2008), but it is also considered an important variable relating to perfectionism (Flett et al., 2002). Michael et al. (2007) suggested that cognitive-rumination acts as a maintaining factor due to focusing on "why" and "what if" questions, rather than processing the actual trauma itself. Research has outlined overthinking, intrusive thoughts, and loss of focus in relation to the yips and LMS (Bawden & Maynard, 2001; Rotherham et al., 2007), thus it is plausible that rumination may also serve as a mediator of perfectionism in the yips and LMS. The revised Ruminative Response Scale (RRS) from the Response Styles Questionnaire (RSQ; Nolen-Hoeksema, 1991, see Appendix 3) is a self-report measure of rumination. The revised version omits depression related items from the original inventory, which, based on the purpose of the current study is considered most appropriate (Egan et al., 2013). Specifically, the revised 10-item scale measures two principle components of rumination, 'reflective pondering' (engagement in problem solving to help alleviate negative affect) and 'brooding' (thinking anxiously or worrying in a negative fashion over some unachieved standard).

In addition to the supposed psychological nature of the yips and LMS, research has also drawn comparisons to trauma experience (Day et al., 2006; Rotherham et al., 2007). Specifically, Day et al. (2006) discussed LMS as equivalent to experiencing a traumatic event, while additional research has found that psychologically significant life-events experienced away from the sporting context, may be a contributing factor to the yips (i.e., physical freezing and fear; Roberts et al., 2013; Rotherham et al., 2007). In their study exploring yips-affected golfers, Rotherham and colleagues (2007) demonstrated that the yips were associated to a chain of significant life-events (e.g., death of a loved one, relationship breakdown) that were experienced prior to initial onset. Day et al. (2006) explored experience of significant life-events in a group of LMS-affected trampolinists and suggested that psychologically significant experiences in sport (e.g., injury, failure) were equivalent to minor trauma experience; and thus triggered comparable behaviour responses to those of trauma victims. History of significant life-experiences has also been associated to increased susceptibility of PTSD development, rather than exposure to a single traumatic event (Dohrenwend, 2013).

Individuals exposed to significant life-events and increased stress can suffer adverse effects if not immediately, sometimes years after the event (Christiansen & Marren, 2013). For example re-experiencing, emotional numbing, behavioural avoidance, and increased physiological arousal, subsequently leading to worsening of conditions. Based on the suggestion that the yips and LMS are psychological, and are comparable to anxiety-related disorders, and trauma

experience, it is important to evaluate their impact on the individual. It is hoped that this may help to identify individual's who may be more susceptible to decompensate. The Impact of Events Scale (IES; Weiss & Marmar, 1997) is a self-report questionnaire, widely adopted to evaluate individual's subjective response to traumatic events, who might also be at risk of developing PTSD. The measure consists of 22 questions, with 3 subscales (intrusion, avoidance, and hyper-arousal).

Research has not yet considered both the yips and LMS in comparison to perfectionism, rumination, and reinvestment. Furthermore, there is yet to be any research conducted exploring the impact of the yips and LMS on the individual. Given the evidence associating these two disorders, in addition to the apparent similarities with other recognised anxiety disorders (i.e., PTSD), it is plausible that the same relationships exist. Thus, the aim of the current study is two part: first, to examine whether cognitive processes (perfectionism, rumination, and reinvestment), that have found to be elevated across several anxiety disorders, are also associated with both the yips and LMS. A second aim is to explore the impact of the yips and LMS on the individual's stress response. The study will adopt appropriate psychometrically validated tools (see Appendices 3-6) to confirm the relevance of these findings and enable suitable comparisons to be explored. It is hoped that this will provide future direction towards identifying susceptibility to the yips and LMS. It is hypothesised that higher levels of perfectionism, rumination, and reinvestment will be found in both the yips and LMS sufferers, and that the yips and LMS sufferers will report high scores for intrusion, avoidance, and hyper-arousal according to the IES. Finally, it is anticipated that these levels will be greater than those derived from a matched control group. This will provide greater understanding towards the susceptibility of individuals to the yips and LMS, with a view to exploring potential interventions aimed at treatment, and developing a level of resilience.

12) Participants	
12.1 Number	60 (15 participants experiencing the yips, 15 experiencing LMS, 15 participants in a sport-matched LMS control group, and 15 in a yips control group)
12.2 Rationale for this number (eg calculations of sample size, practical considerations)	Sample size is deemed appropriate according to previous research and requirements for reliable quantitative research (Egan, Hattaway & Kane, 2013; Faul et al., 2009).
12.3 Criteria for inclusion and exclusion (eg age and sex)	Athletes in the experimental condition (20 experiencing yips, and 20 LMS) are required to either be currently experiencing the yips or LMS that has been unsuccessfully addressed at the conscious level (i.e., using CBT/ talk therapy/ behaviour change techniques), or have retired from sport and have experienced one/ or several episodes of the yips or LMS while they were competing at a high level (minimum National representation). Specifically, they will/ or had present(ed) breakdown of a specific skill that had once been performed with ease (see Day et al., 2006 for full LMS criteria and Rotherham et al., 2013 for full yips criteria). All participants will have been referred by a sport psychologist or coach and considered to be

	<p>experiencing the yips or LMS. Participants will be over 17 years of age. The remaining 20 participants will form a control group and are required to meet the following criteria: have never experienced a physical disruption of any skill in their main sport or subsidiary sports played; have never been diagnosed with any form of movement disorder; have never had a close family member suffer any form of movement disorder; have played competitively in a high standard league or equivalent for a minimum of 5 years.</p>
<p>12.4 Procedures for recruitment (eg location and methods)</p>	<p>Athletes will be recruited via purposive sampling (Patton, 2002), in order to assure participants selected are the most appropriate in terms of answering the question being addressed (Fletcher, 2012).</p> <p>All information generated will be stored in password-protected files accessible to the primary research team only. If participants need to be contacted again in the future, the ethics committee will be approached (Holt & Tamminen, 2010).</p> <p>In order to identify athletes experiencing the yips or LMS, sport psychologists and coaches will be contacted via phone, email, and face-to-face and asked to identify athletes with their consent.</p>
<p>12.5 Does the study have *minors or ‡vulnerable adults as participants?</p>	<p>[] Yes [X] No</p>
<p>12.6 Is CRB Disclosure required for the Principal Investigator? (to be determined by Risk Assessment)</p>	<p>[] Yes [X] No</p> <p>If yes, is standard [] or enhanced [] disclosure required?</p>
<p>12.7 If you ticked 'yes' in 12.5 and 'no' in 12.6 please explain why:</p>	

*Minors are participants under the age of 18 years.

‡Vulnerable adults are participants over the age of 16 years who are likely to exhibit:

- a) learning difficulties
- b) physical illness/impairment
- c) mental illness/impairment
- d) advanced age
- e) any other condition that might render them vulnerable

13) Details of the research design

13.1 Provide details of intended methodological procedures and data collection.
(For MSc students conducting a scientific support project please provide the following information: a. needs analysis; b. potential outcome; c proposed interventions).

Those athletes who consented to be identified and contacted, will be contacted via email, phone or face-to-face as opportune, and upon agreement to participate, will be sent an information letter detailing what participation in the study will entail and further information about the aims of the research (see appendix 2). Informed consent will be provided via their willingness to complete and return each questionnaire. Participants will be reminded that all data will remain anonymous and that participation is voluntary. Finally, participants will be made aware they are entitled to withdraw from participation at any time with no notice and that if requested data related to them will not be used. Upon agreement to participate, the principal investigator will send them the four questionnaires (see appendix 3-6) via email, a copy of the participant information sheet and details outlining how to return their completed questionnaires. All returned questionnaires and participant data will be stored in a locked file and/ or password protected folder, accessible to the primary research team only.

The first measure will be the revised Ruminative Response Scale (RRS) from the Response Styles Questionnaire (RSQ; Nolen-Hoeksema, 1991, see Appendix 3), a self-report measure of rumination. The revised version omits depression related items from the original inventory, which, based on the purpose of the current study is considered most appropriate (Egan et al., 2013). Specifically, the revised 10-item scale measures two principle components of rumination, 'reflective pondering' (engagement in problem solving to help alleviate negative affect) and 'brooding' (thinking anxiously or worrying in a negative fashion over some unachieved standard).

The second measure to be used is the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990), which is a 35-item questionnaire designed to measure six dimensions of perfectionism (see Appendix 4). Concern over mistakes (CM); doubts about action (DA); Parental expectations (PE); Parental Criticism (PC); Personal Standards (PS); and Organisation (ORG). Responses on the FMPS are scored on a 5 point likert scale ranging from strongly disagree (1) to strongly agree (5). Internal consistency for the subscales (α +0.73-0.93) and the overall scale is satisfactory (α +0.90; Frost et al., 1993).

The third questionnaire to be used is the reinvestment scale (Masters et al., 1990). The reinvestment scale contains 20 items drawn from three scales that were considered likely to predict individual propensity for reinvestment of controlled processing. Twelve items are taken from the

Self-Conscious scale (e.g., I'm aware of the way my mind works when I work through a problem; Fenington et al., 1975). A further seven items are taken from the rehearsal factor of the Emotional Control Questionnaire (e.g., I often find myself thinking over and over about things that have made me angry; Roger & Nesshover, 1987). The final item is taken from the cognitive failures questionnaire (Do you have trouble making up your mind; Broadbent et al., 1982). Masters et al., (1993) indicated that the reinvestment scale in sport has adequate internal reliability (Cronbach $\alpha=0.86$) and test retest reliability over a four-month period ($r=0.74$).

Finally, the Impact of Events Scale will be administered (IES; Weiss & Marmar, 1997). The IES is a self-report questionnaire consisting of 22 questions, with 3 subscales: intrusion (intrusive thoughts, nightmares, intrusive feelings and imagery, dissociative-like re-experiencing), avoidance (numbing of responsiveness, avoidance of feelings, situations and ideas), and hyper-arousal (anger, irritability, hyper-vigilance, difficulty concentrating, heightened startle), as well as a total subjective-stress IES score (see Appendix 5).

13.2 Are these "minor" procedures as defined in Appendix 1 of the ethics guidelines?

Yes No

13.3 If you answered 'no' in section 13.2, list the procedures that are not minor

13.4 Provide details of the quantitative and qualitative analysis to be used

A 3-way between subjects ANOVA will be conducted to test the difference between a two experimental groups (suffering from the yips or LMS), against a sport-matched control group (suffering from neither). Dependant variables will be perfectionism, rumination, reinvestment, and Impact of Event score, and the ANOVA will test the difference between these scores. Effect size statistics will be used to interpret the data based on Cohen's 'd' (1988) where effect sizes will be considered small (0.01), medium (0.059), or large (0.138). Prior to analysis assumptions of ANOVA will be checked visually and statistically in SPSS.

14) Substances to be administered (refer to Appendix VI of the ethics procedures)

14.1 The protocol does not involve the administration of pharmacologically active substances or nutritional supplements.

Please tick box if this statement applies and go to section 15)

14.2 Name and state the risk category for each substance. If a COSHH assessment is required state how the risks are to be managed.

15) Degree of discomfort that participants might experience

Consider the degree of physical and psychological discomfort that will be experienced by the participants. State the details which must be included in the participant information sheet to ensure that the participants are fully informed about any discomfort that they may experience.

See appendix 2 for participant information sheet.

16) Outcomes of Risk Assessment

Provide details of the risk and explain how the control measures will be implemented to manage the risk.

Low risk. Counselling referral process in place should participants experience any level of distress on completing the questionnaires.

17) Attachments	Tick box
17.1 Risk assessment (including CRB risk assessment)	X
17.2 COSHH assessment	NA
17.3 Participant information sheet (this should be addressed directly to the participant (ie you will etc) and in a language they will understand)	X
17.4 Informed consent form	X
17.5 Pre-screening questionnaire	NA
17.6 Collaboration evidence/support correspondence from the organisation consenting to the research (this must be on letterhead paper and signed) See sections 9 & 10.	NA
17.7 CRB Disclosure certificate <u>or</u> where not available CRB application form	NA
17.8 Clinical Trails form (FIN 12)	NA

<p>18. Signature Principal Investigator</p>	<p>Once this application is approved, I will undertake the research study as approved. If circumstances necessitate that changes are made to the approved protocol, I will discuss these with my Project Supervisor. If the supervisor advises that there should be a resubmission to the Sport and Exercise Research Ethics Review Group, I agree that no work will be carried out using the changed protocol until approval has been sought and formally received.</p> <p style="text-align: right;">Date 20th January 2014</p> <p>Principal Investigator signature</p> <p>Name Miss Jennifer E Bennett</p>
<p>19. Approval Project Supervisor to sign either box A or box B as applicable</p> <p>(refer to Appendix I and the flowchart in appendix VI of the ethics guidelines)</p>	<p>Box A:</p> <p>I confirm that the research proposed is based solely on 'minor' procedures, as outlined in Appendix 1 of the HWB Sport and Exercise Research Ethics Review Group 'Ethics Procedures for Research with Humans as Participants' document, and therefore does not need to be submitted to the HWB Sport and Exercise Research Ethics Review Group.</p> <p>In terms of ethics approval, I agree the 'minor' procedures proposed here and confirm that the Principal Investigator may proceed with the study as designed.</p> <p style="text-align: center;"><i>I. W. Maynard</i> Date 26/01/14</p> <p>Project Supervisor signature</p> <p>Name _____</p>
	<p>Box B:</p> <p>I confirm that the research proposed is <u>not</u> based solely on 'minor' procedures, as outlined in Appendix 1 of the HWB Sport and Exercise Research Ethics Review Group 'Ethics Procedures for Research with Humans as Participants' document, and therefore <u>must</u> be submitted to the HWB Sport and Exercise Research Ethics Review Group for approval.</p> <p>I confirm that the appropriate preparatory work has been undertaken and that this document is in a fit state for submission to the HWB Sport and Exercise Research Ethics Review Group.</p> <p>_____ Date _____</p> <p>Project Supervisor signature</p> <p>Name _____</p>
<p>20. Signature Technician</p>	<p>I confirm that I have seen the full and approved application for ethics approval and technical support will be provided.</p> <p>_____ Date _____</p> <p>Technician signature</p> <p>Name _____</p>

Participant Information

Aim of the research: This research is aiming to explore the personality characteristics of perfectionism, reinvestment, and rumination, among elite sports performers. A second aim is to explore the impact of specific performance problems and/ or worst performance experiences on the individual.

Name of researchers: Jenn Bennett

Contact details for primary researchers: jen.bennett@eis2win.co.uk

The purpose of this study is to explore the personality characteristics associated with the experience of various performance problems and/ or worst performance experiences in sport. In addition to this, we are also exploring the impact these problems have on individuals. This is with the aim to identify individuals who may be more susceptible to experiencing/ repeatedly experiencing these problems, and to develop appropriate interventions to prevent them happening. Participants will be required to complete four questionnaires: three of these will be exploring characteristics of personality: perfectionism, reinvestment, and rumination. The fourth will assess the impact of the experience for you as an individual. Each questionnaire consists of no more than 35 questions and should take no longer than 30 minutes in total to complete. Participation is voluntary and you have the right to withdraw from the study at any time. Data will solely be used for the purpose outlined above, however there is potential for the study to be published in an academic journal. All information and data will remain anonymous and participants will be assigned ID numbers in the written report of the data. All data will be kept on a secure, password-protected computer and written copies of the questionnaires will be locked in a drawer.

Questionnaire cover sheet

Jenn Bennett, & Mike Rotherham

English Institute of Sport (EIS) Sheffield | Coleridge Road | Sheffield | S9 5DA
The Centre for Sport and Exercise Science | Collegiate Crescent Campus | Sheffield | S10
2BP

jen.bennett@eis2win.co.uk
mike.rotherham@eis2win.co.uk

Participant details

Name:

Age:

Gender:

Email:

Phone:

Sport:

Event(s)/Position(s):

Number of years competing:

Current level of competition (please state if retired):

Number of years at this level:

Highest performance level:

Major achievements:

**Faculty of Health and Wellbeing Research Ethics Committee
Sport and Exercise Research Ethics Review Group**

Risk Assessment Pro Forma

****Please ensure that you read the accompanying
Risk Assessment Risk Ranking document before completing this form****

Title of research	Perfectionism, rumination, and reinvestment, and the impact of the yi and LMS for affected-individuals.
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Date Assessed	20 th January 2014
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Assessed by (Principal Investigator)	J Bennett
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Signed	Position
J Bennett	Principal Investigator

Activity	Risks	Control Measures
Put in this box the activity which may cause harm.	Risk of [place in here the harm that may be caused] caused by [put in the hazard (source of danger) here]. Risk = consequence x likelihood. Identify risk category Low Medium or High	Place here what you would do to minimise the risk
Responding to various questions via questionnaire	Risk by consequence: interviews resulting in minor distress no counselling required. R = 1 = Low	Monitor and cross check participant comfort throughout the interview.

Risk Evaluation (Overall)
R=1 Low

General Control Measures
Is a pre-screen medical questionnaire required? Yes [] No [X]

Emergency Procedures
Counselling referral available

Monitoring Procedures
Cross-checking participant comfort throughout the data collection process. Maintaining confidentiality and participant well being throughout the study. Providing adequate information and opportunity for questioning prior to the study and after the questionnaire has been completed.

Review Period	Per study
----------------------	-----------

Reviewed By (Supervisor)	Date

The Frost Multidimensional Perfectionism Scale (FMPS; Frost, 1990).

Please indicate next to each statement whether you agree or disagree on a scale of 1 to 5, where 1= strongly disagree, and 5= strongly agree.

1. My parents set very high standards for me.
2. Organisation is very important to me.
3. As a child I was punished for doing things less than perfectly.
4. If I do not set the highest standards for myself I am likely to end up a second rate person.
5. My parents never tried to understand my mistakes.
6. It is important to me that I am thoroughly competent in everything I do.
7. I am a neat person.
8. I try to be an organised person.
9. If I fail at work/school I am a failure as a person.
10. I should be upset if I make a mistake.
11. My parents wanted me to be the best at everything.
12. I set higher goals for myself than most people.
13. If someone does a task at work/school better than me, then I feel like I failed the whole task.
14. If I fail partly it is as bad as being a complete failure.
15. Only outstanding performance is good enough in my family.
16. I am very good at focussing my efforts on attaining a goal.
17. Even when I do something very carefully, I often feel that it is not done quite right.
18. I hate being less than the best at things.
19. I have extremely high goals.
20. My parents have expected excellence from me.
21. People will probably think less of me if I make a mistake.
22. I never felt like I could meet my parents expectations.
23. If I do not do as well as other people, it means I am an inferior human being.
24. Other people seem to accept lower standards for themselves than me.
25. If I do not do well at the time, people will not respect me.
26. My parents have always had higher expectations for my future than I have.
27. I try to be a neat person.

28. I usually have doubts about the simple everyday things I do.
29. Neatness is very important to me.
30. I expect higher performance in my daily tasks than most people.
31. I am an organised person.
32. I tend to get behind in my work because I repeat things over and over.
33. It takes me a long time to do something right.
34. The fewer mistakes I make the more people will like me.
35. I never felt like I could meet my parent's standards.

Reinvestment Scale (Masters 1992)

Please indicate using "Yes" and "No" answers whether or not the statement applies to you.

1. I remember things that upset me or make me angry for a long time afterwards.
2. I get "worked up" just thinking about things that have upset me in the past.
3. I often find myself thinking over and over about things that have made me angry.
4. I think about ways of getting back at people who have made me angry long after the event has happened.
5. I never forget people making me angry or upset, even about small things.
6. When I am reminded of my past failures, I feel as if they are happening all over again.
7. I worry less about the future than most people I know.
8. I'm always trying to figure myself out.
9. I reflect about myself a lot.
10. I'm constantly examining my motives.
11. I sometimes have the feeling that I'm off somewhere watching myself.
12. I'm alert to changes in my mood.
13. I'm aware of the way my mind works when I work through a problem.
14. I'm concerned about my style of doing things.
15. I'm concerned about the way I present myself.
16. I'm self-conscious about the way I look.
17. I usually worry about making a good impression.
18. One of the last things I do before leaving my house is look in the mirror.
19. I'm concerned about what other people think of me.
20. Do you have trouble making up your mind?

Appendix 8

Ruminative Response Scale

Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one in relation to your specific performance problem/ worst experience in sport. Please indicate what you *generally* do, not what you think you should do.

1= almost never, 2= sometimes, 3= often, 4= almost always

1. Think about how alone you feel ___
2. Think "I won't be able to do my job if I don't snap out of this" ___
3. Think about your feelings of fatigue and achiness ___
4. Think about how hard it is to concentrate ___
5. Think "What am I doing to deserve this?" ___
6. Think about how passive and unmotivated you feel ___
7. Analyze recent events to try to understand why you are depressed ___
8. Think about how you don't seem to feel anything anymore ___
9. Think "Why can't I get going?" ___
10. Think "Why do I always react this way?" ___
11. Go away by yourself and think about why you feel this way ___
12. Write down what you are thinking about and analyze it ___
13. Think about a recent situation, wishing it had gone better ___
14. Think "I won't be able to concentrate if I keep feeling this way." ___
15. Think "Why do I have problems other people don't have?" ___
16. Think "Why can't I handle things better?" ___
17. Think about how sad you feel. ___
18. Think about all your shortcomings, failings, faults, mistakes ___
19. Think about how you don't feel up to doing anything ___
20. Analyze your personality to try to understand why you are depressed ___
21. Go someplace alone to think about your feelings ___
22. Think about how angry you are with yourself ___

The Impact of Events Scale – Revised (IES – R; Weiss & Marmar, 1997).

INSTRUCTIONS: Below is a list of difficulties people sometimes have after stressful life-events. Please read each item, and then indicate how distressing each one has been for you with respect to a specific performance problem or worst performance. Please respond to each item using a scale of 0-4, where: 0 = Not at all; 1 = A little bit; 2 = Moderately; 3 = Quite a bit; 4 = Extremely.

1. Any reminder brought back feelings about it.
2. I had trouble staying asleep.
3. Other things kept making me think about it.
4. I felt irritable and angry.
5. I avoided letting myself get upset when I thought about it or was reminded of it.
6. I thought about it when I didn't mean to.
7. I felt as if it hadn't happened or wasn't real.
8. I stayed awake from reminders of it.
9. Pictures about it popped into my mind.
10. I was jumpy and easily startled.
11. I tried not to think about it.
12. I was aware that I still had a lot of feelings about it but I didn't deal with them.
13. My feelings about it were kind of numb.
14. I found myself acting or feeling like I was back at that time.
15. I had trouble falling asleep.
16. I had waves of strong feelings about it.
17. I tried to remove it from my memory.
18. I had trouble concentrating.
19. Reminders of it caused me to have physical reactions such as sweating, trouble breathing, nausea, or pounding heart.
20. I had dreams about it.
21. I felt watchful and on-guard.
22. I tried not to talk about it.

Appendix 10

Between-groups *P*-values, confidence intervals, and effect sizes for each dependant variable.

Dependant Variable	Group	Sig.	Confidence Interval (95%)		Effect Size
Rumination	LMS YIPS	0.050	Lower Boundary	10.33793418	0.314186
			Upper Boundary	10.99526582	
	LMS LMSC*	0.000	Lower Boundary	24.81337905	0.740522
			Upper Boundary	25.45322095	
	YIPS YIPSC*	0.004	Lower Boundary	13.81424125	0.4163
			Upper Boundary	14.45255875	
Reinvestment	LMS YIPS	0.638	Lower Boundary	0.685470586	0.155981
			Upper Boundary	0.914529414	
	LMS LMSC*	0.000	Lower Boundary	4.679666953	0.935886
			Upper Boundary	4.920333047	
	YIPS YIPSC*	0.000	Lower Boundary	5.765789195	1.144511
			Upper Boundary	5.974210805	
Perfectionism	LMS YIPS	0.197	Lower Boundary	5.806172003	0.20236
			Upper Boundary	6.327227997	
	LMS LMSC*	0.000	Lower Boundary	49.79193841	1.670022
			Upper Boundary	50.34146159	
	YIPS YIPSC*	0.000	Lower Boundary	50.3355853	1.48545
			Upper Boundary	50.8644147	
Concern Over Mistakes	LMS YIPS	0.812	Lower Boundary	1.514743246	0.144585
			Upper Boundary	1.818656754	
	LMS LMSC*	0.000	Lower Boundary	16.97935057	1.483365
			Upper Boundary	17.28724943	
	YIPS YIPSC*	0.000	Lower Boundary	13.418941	1.177174
			Upper Boundary	13.780459	
Doubts About Action	LMS YIPS	1.000	Lower Boundary	0.022534208	0.112315
			Upper Boundary	1.177465792	

	LMS LMSC*	0.000	Lower Boundary	6.199446715	1.184925
			Upper Boundary	6.460553285	
	YIPS YIPSC*	0.000	Lower Boundary	4.73022797	0.91037
			Upper Boundary	4.99637203	
Parental Expectations	LMS YIPS	0.984	Lower Boundary	1.006698832	0.121063
			Upper Boundary	1.260101168	
	LMS LMSC	1.000	Lower Boundary	0.792695792	0.099701
			Upper Boundary	1.074104208	
	YIPS YIPSC	0.616	Lower Boundary	1.186692823	0.142416
			Upper Boundary	1.479907177	
Parental Criticism	LMS YIPS	1.000	Lower Boundary	0.91765462	0.883082
			Upper Boundary	1.21574538	
	LMS LMSC	0.029	Lower Boundary	2.630643622	0.231802
			Upper Boundary	2.969356378	
	YIPS YIPSC*	0.002	Lower Boundary	3.523280912	0.303553
			Upper Boundary	3.810719088	
Personal Standards	LMS YIPS	1.000	Lower Boundary	0.604590796	0.055809
			Upper Boundary	0.995409204	
	LMS LMSC*	0.000	Lower Boundary	12.81000024	0.906896
			Upper Boundary	13.18999976	
	YIPS YIPSC*	0.000	Lower Boundary	11.28975428	0.799925
			Upper Boundary	11.64344572	
Organisation	LMS YIPS	1.000	Lower Boundary	0.676055855	0.078166
			Upper Boundary	0.923944145	
	LMS LMSC*	0.000	Lower Boundary	10.31878392	1.022674
			Upper Boundary	10.61461608	
	YIPS YIPSC*	0.000	Lower Boundary	9.466741788	0.937991
			Upper Boundary	9.733258212	
Impact of Event	LMS YIPS	0.199	Lower Boundary	7.344564201	0.238752
			Upper	7.988635799	

			Boundary		
LMS LMSC*	0.000	Lower Boundary	26.04127183	0.820066	
		Upper Boundary	26.62532817		
YIPS YIPSC*	0.000	Lower Boundary	27.75549863	0.874048	
		Upper Boundary	28.37790137		

* = sig. at $\geq .005$

**effect sizes in accordance with cohen's *d* where $\geq .10$ = a small effect, $\geq .30$ = a medium effect, and $\geq .50$ = a large effect

Appendix 11

APPLICATION FOR ETHICS APPROVAL OF RESEARCH

In designing research involving humans, principal investigators should be able to demonstrate a clear intention of benefit to society and the research should be based on sound principles. These criteria will be considered by the Sport and Exercise Research Ethics Review Group before approving a project. **ALL** of the following details must be provided, either typewritten or word-processed preferably at least in 11 point font.

Please either tick the appropriate box or provide the information required.

1) Date of application	20 th March 2015
2) Anticipated date of completion of project	August 2015
3) Title of research	Preliminary evidence for the treatment of performance blocks in sport: The efficacy of eye movement desensitisation and reprocessing.
4) Subject area	Sport Psychology
5) Principal Investigator Name Email address @ SHU Telephone/Mobile number Student number (if applicable)	 Jenn Bennett Jebenne2@my.shu.ac.uk
6) State if this study is: (If the project is undergraduate or postgraduate please state module name and number)	<input type="checkbox"/> Research <input type="checkbox"/> Undergraduate <input type="checkbox"/> Postgraduate Module name: Module number:

7) Director of Studies/Supervisor/ Tutor name	Professor Ian Maynard
8) Intended duration and timing of project?	6 Months March 2015-August 2015
9) Location of project If external to SHU, provide evidence in support (see section 17)	SHU and EIS Sheffield (principle researchers place of work).
10) State if this study is:	<input type="checkbox"/> New <input type="checkbox"/> Collaborative (please include appropriate agreements in section 17) <input type="checkbox"/> Replication of :

11) Purpose and benefit of the research

Statement of the research problem with any necessary background information (no more than 1 side of A4)

With the exception of one study, research to date has considered performance blocks under disparate labels according to sport (e.g., the yips in golf and cricket/ LMS in artistic sports). If, as research suggests, these problems are in fact the same irrespective of sport, it would follow that the same treatment method should also be appropriate. Thus, the aims of the current study are two fold: first to investigate if EMDR can reduce the symptoms of two performance blocks (the yips and LMS) experienced by two different elite athletes competing in two different sports, consequently leading to performance enhancement of the affected skill in both cases. It is argued that focussing on significant events prior to onset of performance block symptoms, and the emotions associated with these events, that the performance block will subside, and the individual will regain ability to execute the skill without further involuntary disturbance. A secondary aim is to comprehend the individual's experience of receiving EMDR within the context of elite sport, and to ascertain any sport specific considerations when using this method.

12) Participants**12.1 Number**

2

12.2 Rationale for this number
(eg calculations of sample size, practical considerations)

2 single case study's testing an intervention for the treatment of 2 specific problems.

12.3 Criteria for inclusion and exclusion
(eg age and sex)

Suitability for the study will be confirmed by self-report, and observation of the problem, in line with the following criteria: a long-term inability to perform a certain movement that could previously be performed at ease; an extreme fear associated with the affected movement; an extreme momentary loss of control over the skill being performed; the experience of freezing, shaking, jerking, or muscular spasms when attempting to execute the movement; and competing at World-class/Professional level in either diving, gymnastics, or trampolining (LMS), or golf or cricket (the yips). Participants are required to meet all of the above criteria. Additional criteria stipulates that the participants are: over the age of 18 years; currently experiencing the problem, and have been for a minimum of three months; not currently undergoing any other form of treatment (physical or psychological) relating to the problem; and able to consciously recollect a history of significant life-events occurring prior to

	their first experience of the yips/LMS. The identified athletes will undergo initial pre-screening interviews and observation of the problem to confirm eligibility for inclusion. All treatment sessions will be conducted in the participants training environment, including pre- and post- performance measures, and social validation data collection.
12.4 Procedures for recruitment (eg location and methods)	Purposeful recruitment for the research study following contact by the participant with presenting symptoms for treatment by a sport psychologist.
12.5 Does the study have *minors or †vulnerable adults as participants?	<input type="checkbox"/> Yes <input type="checkbox"/> No
12.6 Is CRB Disclosure required for the Principal Investigator? (to be determined by Risk Assessment)	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, is standard <input type="checkbox"/> or enhanced <input type="checkbox"/> disclosure required?
12.7 If you ticked 'yes' in 12.5 and 'no' in 12.6 please explain why:	

*Minors are participants under the age of 18 years.

†Vulnerable adults are participants over the age of 16 years who are likely to exhibit:

- a) learning difficulties
- b) physical illness/impairment
- c) mental illness/impairment
- d) advanced age
- e) any other condition that might render them vulnerable

13) Details of the research design

13.1 Provide details of intended methodological procedures and data collection.
(For MSc students conducting a scientific support project please provide the following information: a. needs analysis; b. potential outcome; c proposed interventions).

To increase fidelity to the EMDR protocol, two different therapists will be used to deliver each EMDR intervention. Each athlete's existing sport psychologist will be involved throughout the intervention. Therapists and sport psychologists will also be interviewed post intervention to confirm overall experience of the intervention and outcome effects. This study will investigate the integration of EMDR treatment with a program of graded exposure, using a mixed methods approach of qualitative and quantitative data collection. This is with the understanding that such a study design can contribute to the literature in several ways. First, a quantitative case study can

provide a preliminary investigation of a hypothesis, thus evaluating the potential need for further research (Creswell, 2003). Second, the results of statistical data can inform clinical practice by providing some empirical support to guide more effective treatment (Mertens, 2005). Third, the case-study evaluation of two individual cases can provide in-depth understanding of the individual's phenomenological experience within the boundaries and limitations of said design. This study will investigate the outcome of a treatment intervention incorporating the standard EMDR protocol, and graded exposure, for two individuals, one presenting symptoms of LMS in platform diving, and another individual presenting symptoms of the yips in golf.

Different sources of information will be used to cross-validate findings, patterns and conclusions. Two evaluators will review the material in each case study to independently make judgements and interpretations about the content and meaning of the material in each case. In addition, an external evaluator will review the raw data to check for biases or unwarranted conclusions. Case studies will also sent be out to participants who will be asked to comment on the accuracy of fact and interpretation in each respective study (Patton, 2002).

13.2 Are these "minor" procedures as defined in Appendix 1 of the ethics guidelines?

Yes No

13.3 If you answered 'no' in section 13.2, list the procedures that are not minor

13.4 Provide details of the quantitative and qualitative analysis to be used

Measurements will include the following: pre- and post-intervention Golf Biodynamics data measuring physical movement disruption of the affected limbs. Subjective Units of Distress (SUD) scale measuring subjective anxiety experience on a scale of 0-10 (0 = no anxiety, 10 = extreme distress), taken during each EMDR session. Value of Cognition (VoC) measuring perceived belief in positive cognition on a scale of 0-10 (0 = no belief, 10 = full belief). Pre- and post- intervention observation of the probem. Pre-, during- and post-intervention self-report of physical and emotional disturbance.

14) Substances to be administered (refer to Appendix VI of the ethics procedures)

14.1 The protocol does not involve the administration of pharmacologically active substances or nutritional supplements.

Please tick box if this statement applies and go to section 15) [/]

14.2 Name and state the risk category for each substance. If a COSHH assessment is required state how the risks are to be managed.

15) Degree of discomfort that participants might experience

Consider the degree of physical and psychological discomfort that will be experienced by the participants. State the details which must be included in the participant information sheet to ensure that the participants are fully informed about any discomfort that they may experience.

Minor discomfort. The participant might experience a minor degree of psychological discomfort in the form of emotional unease as a result of the EMDR phase of the intervention. This is because EMDR involves recalling and reprocessing memories that are associated with past events the participant identifies as particularly overwhelming. This will be monitored and supported by the clinical psychologist throughout the intervention period and at several follow up points post treatment.

16) Outcomes of Risk Assessment

Provide details of the risk and explain how the control measures will be implemented to manage the risk.

Outcome: Minor. A trained clinical psychologist will be involved in delivering the intervention and supporting the participant throughout the treatment phase and at several follow up points post treatment.

17) Attachments

Tick box

17.1 Risk assessment (including CRB risk assessment)

Y

17.2 COSHH assessment

N/A

17.3 Participant information sheet (this should be addressed directly to the participant (ie you will etc) and in a language they will understand)

Y

17.4 Informed consent form	Y
17.5 Pre-screening questionnaire	N/A
17.6 Collaboration evidence/support correspondence from the organisation consenting to the research (this must be on letterhead paper and signed) See sections 9 & 10.	N/A
17.7 CRB Disclosure certificate <u>or</u> where not available CRB application form	N/A
17.8 Clinical Trails form (FIN 12)	N/A

<p>18. Signature Principal Investigator</p>	<p>Once this application is approved, I will undertake the research study as approved. If circumstances necessitate that changes are made to the approved protocol, I will discuss these with my Project Supervisor. If the supervisor advises that there should be a resubmission to the Sport and Exercise Research Ethics Review Group, I agree that no work will be carried out using the changed protocol until approval has been sought and formally received.</p> <p>___ J Bennett ___ Date ___ 19/03/15 ___ Principal Investigator signature</p> <p>Name ___ Miss J E Bennett ___</p>
<p>19. Approval Project Supervisor to sign either box A or box B as applicable</p> <p>(refer to Appendix I and the flowchart in appendix VI of the ethics guidelines)</p>	<p>Box A:</p> <p>I confirm that the research proposed is based solely on 'minor' procedures, as outlined in Appendix 1 of the HWB Sport and Exercise Research Ethics Review Group 'Ethics Procedures for Research with Humans as Participants' document, and therefore does not need to be submitted to the HWB Sport and Exercise Research Ethics Review Group.</p> <p>In terms of ethics approval, I agree the 'minor' procedures proposed here and confirm that the Principal Investigator may proceed with the study as designed.</p> <p><i>I. W. Maynard</i> _____ Date <u>23.3.15.</u> _____ Project Supervisor signature</p> <p>Name <u> Ian Maynard </u> _____</p>
	<p>Box B:</p> <p>I confirm that the research proposed is <u>not</u> based solely on 'minor' procedures, as outlined in Appendix 1 of the HWB Sport and Exercise Research Ethics Review Group 'Ethics Procedures for Research with Humans as Participants' document, and therefore <u>must</u> be submitted to the HWB Sport and Exercise Research Ethics Review Group for approval.</p> <p>I confirm that the appropriate preparatory work has been undertaken and that this document is in a fit state for submission to the HWB Sport and Exercise Research Ethics Review Group.</p> <p>_____ Date _____ Project Supervisor signature</p> <p>Name _____</p>
<p>20. Signature Technician</p>	<p>I confirm that I have seen the full and approved application for ethics approval and technical support will be provided.</p> <p>_____ Date _____ Technician signature</p> <p>Name _____</p>

INFORMED CONSENT FORM

TITLE OF PROJECT:

The participant should complete the whole of this sheet himself/herself

Have you read the Participant Information Sheet?	YES/NO
--	--------

Have you had an opportunity to ask questions and discuss this study?	YES/NO
--	--------

Have you received satisfactory answers to all of your questions?	YES/NO
--	--------

Have you received enough information about the study?	YES/NO
---	--------

<p>To whom have you spoken?</p> <p>Do you understand that you are free to withdraw from the study:</p> <ul style="list-style-type: none"> • at any time • without having to give a reason for withdrawing • and without affecting your future medical care 	YES/NO
---	--------

Have you had sufficient time to consider the nature of this project?	YES/NO
--	--------

Do you agree to take part in this study?	YES/NO
--	--------

Signed Date

(NAME IN BLOCK LETTERS).....

Signature of Parent / Guardian in the case of a minor

.....

FOR USE WHEN STILL OR MOVING IMAGES WILL BE RECORDED

Consent to scientific illustration

I hereby confirm that I give consent for photographic and/or videotape and sound recordings (the 'material') to be made of me. I confirm that the purpose for which the material would be used has been explained to me in terms which I have understood and I agree to the use of the material in such circumstances. I understand that if the material is required for use in any other way than that explained to me then my consent to this will be specifically sought.

1. I understand that the material will form part of my confidential records and has value in scientific assessment and I agree to this use of the material.

Signed..... Date.....

Signature of Parent / Guardian in the case of a minor

.....

2. I understand the material has value in teaching and I consent to the material being shown to appropriate professional staff for the purpose of education, staff training and professional development.

Signed..... Date.....

Signature of Parent / Guardian in the case of a minor

.....

I hereby give consent for the photographic recording made of me on..... to be published in an appropriate journal or textbook. It is understood that I have the right to withdraw consent at any time prior to publication but that once the images are in the public domain there may be no opportunity for the effective withdrawal of consent.

Signed Date

Signature of Parent / Guardian in the case of a minor

.....

CLIENT CONSENT FORM (EMDR)

Eye Movement Desensitization and Reprocessing (EMDR) methodology is a form of adaptive information processing which may help the brain unblock maladaptive material.

I have been advised and understand that Eye Movement Desensitisation and Reprocessing (EMDR) is a treatment approach that has been widely validated by research in the treatment of post-traumatic stress disorder (PTSD). It is recommended in the UK as a treatment for PTSD by the National Institute for Clinical Excellence (NICE). Research on other applications of EMDR is on-going it appears that it may avoid some of the long and difficult work often involved in the treatment of anxiety, panic attack, depression and phobias.

I have also been specifically advised of the following:

- a) I may experience distressing and unresolved memories during the use of the EMDR procedure
- b) Some clients have experienced reactions during intervention that neither they nor the administering clinician may have anticipated, including but not limited to, a high level of emotion and physical sensations. Subsequent to the treatment sessions, the processing of material may continue and other dreams, memories, thoughts and feelings may continue
- c) Those with limiting or special medical conditions (pregnancy, heart condition, ocular difficulties, etc.) should consult their medical professionals before participating in this therapeutic method.

Before commencing EMDR treatment, I have thoroughly considered all of the above. I have obtained whatever additional input or professional advice I deemed necessary or appropriate to having EMDR treatment, and by my signature below I hereby consent to receiving EMDR treatment. I agree to hold harmless my EMDR clinician and Changing Minds Limited for any unpleasant or unexpected effect which may arise from my experience. I understand that I may stop treatment at any time before or during any EMDR session and that more than one EMDR session is usually necessary in the treatment.

My signature on this acknowledgement and consent form is free from pressure or influence from any person or entity.

Print Name: _____

Signed: _____ **Date** _____

Appendix 12

Developing effective treatment methods for performance blocks in sport

Athlete interview guide

1. Problem formulation.

- a) What performance problem you were experiencing?
 - a. What happened?
 - b. What was it like?
 - c. How often did you experience it?
 - d. Did it transfer to any other skills/environments?
- b) When did it start?
 - a. What was the first experience like?
 - b. Was it always the same?
 - c. Did you know when it would happen?
- c) What impact did it have on you performance?
 - a. Ability to train/ compete?
- d) What impact did it have on your life?
- e) Do you know why it happened?
 - a. Why was that event significant?

Before moving onto the next section is there anything else you would like to add?

2. Reason for EMDR.

- a) What methods had you previously tried to get past this problem?
- b) What were your expectations of EMDR?

Before moving onto the next section is there anything else you would like to add?

3. EMDR intervention.

- a) Did Andy/Kate provide you with enough information about the EMDR process before starting sessions?
 - a. What were you told?
 - b. Did you understand?
 - c. Is there anything else you would like to have known?
- b) Did you have any concerns about the process?
- c) How easy/hard did you find the techniques used in the sessions?
- d) Did the sessions impact on your training/competing?
- e) What level of involvement did your coach have?
- f) What support did you have from Kate throughout this period?

Before moving onto the next section is there anything else you would like to add?

4. Reflections

- a) Has the intervention enabled you to get past the performance block you were experiencing?
- b) What overall impact has EMDR had on your performance?
- c) What impact has EMDR had on any other aspects of your life?
- d) How would you compare EMDR to other methods you have tried in addressing your performance problem?
- e) How easily did you find it to work with the practitioner?
- f) What helped the EMDR process?
- g) What made the process hard?
- h) Did you have any concerns?
- i) Is there anything you wish you had known prior to starting EMDR?
- j) Would you use/ continue to use EMDR again?

That just about brings us to the end of the interview. Before we finish there are a couple more questions I would like to ask you:

4. Are there any areas that you think I might not have covered relating to your experience?
5. Do you think I led, or influenced your answers away from the things you wanted to discuss?

Thank you I think that's everything I wanted to ask you, is there anything you would like to ask me or anything else you would like to add?

Many thanks for your time and involvement in this interview.

Developing effective treatment methods for performance blocks in sport.

Coach interview guide.

1. Background: Exploring the concept and type of performance block.

- f) What is the nature of the problem your athlete was experiencing prior to EMDR?
- g) What impact did this have on his performance?
- h) What impact did it have on his life?

Before moving onto the next section is there anything else you would like to add?

2. Reason for EMDR.

- c) What methods had you already tried to overcome this problem?
- d) Were any of these methods in part successful?
- e) What were your expectations of EMDR?
- f) Did you have any reservations/ concerns about using EMDR?

Before moving onto the next section is there anything else you would like to add?

3. EMDR intervention process.

- g) Did Andy/Kate provide you and your athlete with enough information about the EMDR process before starting sessions?
- h) What level of involvement did you have?

Before moving onto the next section is there anything else you would like to add?

4. Reflections

- k) Has the intervention enabled your athlete to overcome the performance block they were experiencing?
- l) What overall impact has EMDR had on his performance?
- m) What impact has EMDR had on any other aspects of his life?
- n) How easy did you find it to work with the practitioner?
- o) Would you be happy for your athletes to use EMDR again?

That just about brings us to the end of the interview. Before we finish there are a couple more questions I would like to ask you:

6. Are there any areas that you think I might not have covered relating to your experience?
7. Do you think I led, or influenced your answers away from the things you wanted to discuss?

Thank you I think that's everything I wanted to ask you, is there anything you would like to ask me or anything else you would like to add?

Many thanks for your time and involvement in this interview.

Developing effective treatment methods for performance blocks in sport:

Practitioner interview guide.

1. Basic format of the intervention

- a) How many sessions were held?
- b) How frequent were the sessions?
- c) How long were the sessions?
- d) Where did the sessions take place?
- e) How was rapport built and maintained?
- f) What support was provided to the client between sessions?
- g) How was success of the intervention monitored?

Before moving onto the next section is there anything else you would like to add?

2. Problem formulation: Exploring the concept, definition, and type of performance hijack

- a) 3. How did the problem manifest?
- b) 4. What symptoms emerged similar to trauma/ anxiety related disorders?
- c) 5. Was it a-typical of trauma cycle?
- d) 6. What was the level of trauma history consciously reported?
- e) Did you use any additional measures to support this diagnosis (e.g., IES)

Before moving onto the next section is there anything else you would like to add?

3. EMDR intervention process

- a) What education was provided to the client prior to starting EMDR?
- b) Were any introductory sessions provided to familiarise the client with the process?
- c) Was the standard EMDR protocol followed throughout (cf. Shapiro, 2001)?
 - i. If the standard protocol was not followed what changes were made and why?
- d) How receptive was the client to the process?
- e) Did you record SUDs scales before during and after each processing set?
- f) What follow up support if any was delivered?

- g) What other therapeutic methods integrated into the process (e.g., CBT/verbal therapies)?
 - i. Why/why not?

Before moving onto the next section is there anything else you would like to add?

4. Reflections

- a) What were your reflections following the intervention process?
- b) Is there anything on reflection you would do differently again?
- c) Is there anything you wish you had known prior to the formulation and/or intervention process?
- d) Would you recommend using EMDR for similar problems in sport in the future?
- e) What considerations would you foresee regarding the formulation and implementation process?
- f) How would EMDR be integrated into more complex problems?

That just about brings us to the end of the interview; however, before we finish there are a couple more questions I would like to ask you.

- 8. Are there any areas that you think I might not have covered relating to the intervention?
- 9. Do you think I led, or influenced your answers away from the things you wanted to discuss?
- 10. Do you think the interview could be improved in any way?

Thank you I think that's everything I wanted to ask you, is there anything you would like to ask me or anything else you would like to add?

Many thanks for your time and involvement in this interview.

Developing effective treatment methods for performance blocks in sport:

Sport Psychologist interview guide.

1. Context setting

- a) How long have you been working with this athlete?
- b) How long has this athlete been experiencing this specific problem?

2. Background: Exploring the concept and type of performance hijack.

- i) How would you describe the performance problem (i.e., how did it manifest)?
 - a. Physical
 - b. Cognitive
 - c. Emotional
- j) What impact did this have on performance?
- k) Were there times when it was worse/better?
- l) What impact did it have on his/her life?

Before moving onto the next section is there anything else you would like to add?

3. Reason for EMDR.

- g) What methods/ techniques have previously tried to address this problem?
- h) What made you look into EMDR?
- i) What were your expectations of EMDR?
- j) Did you have any reservations/ concerns about using EMDR?

4. EMDR intervention process.

- i) What information was provided about the use of EMDR for this particular problem?
- j) What level of involvement did you have with the intervention process?
 - a. What was your role
 - b. What was the extent of support you provided with coach and athlete?

4. Reflections

- p) What overall impact has EMDR had on his/her performance?
 - Emotional
 - Cognitive
 - Physical
- q) What impact has EMDR had on any other aspects of his/her life?
 - Emotional

- Cognitive
 - Physical
- r) What (if any) considerations should be taken into account formulating this type of problem in sport?
- s) Are there any sport specific considerations?
- t) How do you foresee working with this type of problem in the future?

That just about brings us to the end of the interview. Before we finish there are a couple more questions I would like to ask you:

11. Are there any areas that you think I might not have covered relating to your experience?
12. Do you think I led, or influenced your answers away from the things you wanted to discuss?

Thank you I think that's everything I wanted to ask you, is there anything you would like to ask me or anything else you would like to add?

Many thanks for your time and involvement in this interview.