PSYCHOLOGICAL MECHANISMS THAT UNDERPIN THE 'YIPS' IN SPORT

Mark Alastair Kempthorne Bawden

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ABSTRACT

Recent research has highlighted that the 'yips' in sport represents a continuum on which choking (anxiety related) and dystonia symptoms anchor the extremes (Smith et al., 2000). Previous research investigating the phenomenon has focussed on the 'yips' being a dystonia and has not considered the psychological experience of the problem in detail (McDaniel, Cummings & Shain, 1989; Sachdev, 1992). The primary aim of this thesis was to see if psychological mechanisms underpin the 'yips' experience and if so relate these to the choking model (Baumeister, 1984). The experimental studies established that individuals who have the 'yips' do experience similar underpinning mechanisms to those cited in Baumeister's (1984) model of choking. These factors included increased anxiety responses, increased self-awareness and attempts consciously to process skilled behaviour. However, the personality traits associated with Baumeister's (1984) model were not supported in this thesis. Baumeister's (1984) contention, that low self-conscious individuals would have a greater disposition towards choking, was not supported. Furthermore, the findings indicated that individuals who were dispositionally high in self-consciousness were more prone to performance decrements under pressure and could be more vulnerable to extreme forms of choking such as the 'yips'. The final aim of this thesis attempted to establish a psychological intervention package that could aid performers who experience the 'yips'. Individuals who experience the problem appear to be unable to image successful performances, and subsequently reinforce negative expectations whenever they attempt to focus on performing. Sufferers also attempt consciously to process their skilled behaviour when they experience stress (Masters, 1992), hence subsequent performances tend to be dominated by the analytical left hemisphere of the brain (Crews, 2001). The psychological intervention strategies were implemented to allow individuals to focus on positive performance expectations that could counteract conscious processing and could subsequently increase activity in the right hemisphere of the brain (Crews, 2001). The findings from these studies established that the use of external imagery and holistic trigger words could help counteract the negative effects of conscious processing and ensure a positive approach to performance. The findings within this thesis can be seen as an initial step towards an understanding of psychological components of the 'yips' experience. Future research should investigate the efficacy of psychological intervention strategies in a number of sports, and test these techniques in ecologically valid competitive conditions. Future research could also usefully examine the aetiology of the 'yips' and establish the relationship between dispositional self-consciousness and the development of the 'yips' in sport.

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CONTENTS

ABSTRACT	1
CHAPTER 1	**12**
1.0. INTRODUCTION	13
CHAPTER 2	**19**
2.0. REVIEW OF LITERATURE	20
2.1. Arousal, Anxiety, Stress and Performance	21
2.2. Performance Anxiety	31
2.3. Self-awareness and Self-consciousness	34
2.4. Attention and Automaticity	37
2.5. The Attention – Anxiety Relationship	44
2.6. Choking and Performance	47
2.7. Sport Performance Phobias	58
2.8. The 'Yips'	65
2.9. Summary and Aims of Research	77
CHAPTER 3	**79**
3.0. STUDY 1 (part 1). A QUALITATIVE INVESTIGATION INTO THE PSYCHOLOGICAL CHARACTERISTICS OF THE 'YIPS'	80
3.1 Introduction	80
3.2. Method	81
3.3. Results and Discussion	84
3.4. General Discussion	105

3.5. STUDY 1 (part 2). ASSESSING INDIVIDUAL PERCEPTIONS OF THE 'YIPS' IN CRICKETERS: AN EXPLORATORY INVESTIGATION USING THE REPERTORY GRIID TECHNIQUE 112

3.6. Introduction 112

3.7. Method 114

3.8. Results 116

3.9. Discussion 123

3.10. Authors note 126

CHAPTER 4 **128**

4.0. STUDY 2. DISPOSITIONAL SELF-CONSCIOUSNESS, CONSCIOUS PROCESSING AND GOLF PUTTING PERFORMANCE 129

4.1. Introduction 129

4.2. Method 132

4.3. Results 136

4.4. Discussion 141

CHAPTER 5 **145**

5.0. STUDY 3. DISPOSITIONAL SELF-CONSCIOUSNESS, MANIPULATED STRESS AND GOLF PUTTING PERFORMANCE 146

5.1. Introduction 146

5.2. Method 148

5.3. Results 151

5.4. Discussion 160

CHAPTER 6 **166**

6.0. STUDY 4. REINVESTMENT: LEARNING TO COPE WITH CONSCIOUS PROCESSING UNDER STRESS 167

6.1. Introduction 167

6.2. Method 170

6.3. Results 175

6.4. Discussion 179

CHAPTER 7 **183**

7.0. STUDY 5. AN INTERVENTION STRATEGY FOR GOLFERS WHO EXPERIENCE THE 'YIPS' WHILST PUTTING 184

7.1. Introduction 184

7.2. Method 186

7.3. Results 193

7.4. Discussion 202

CHAPTER 8 **207**

8.0. DISCUSSION AND CONCLUSIONS 208

8.1. Summary of Findings 208

8.1.1. The Aetiology of the 'Yips' 208

8.1.2. The Psychological Characteristics of the 'Yips' Experience 210

8.1.3. The Mechanisms Underpinning the Choking Model 212

8.1.4. Intervention Strategies to Counteract the 'Yips' 214

8.1.5. A Model of Choking Leading to the 'Yips' 217

8.2. Recommendations for Future Research 221

8.3. Conclusions 225

REFERENCES 227

APPENDICES

LIST OF FIGURES

Figure	Title	Page No.
2.1	A control model of facilitative and debilitative competitive anxiety	26
2.2	A control process perspective on anxiety and attention	46
3.1	Conditions before the first experience of the 'yips'	86
3.2	The first experience of the 'yips'	88
3.3	Perceptions during the first experience - Anxiety	90-91
3.4	Perceptions during the first experience – Emotions / Feelings	91
3.5	Perceptions during the first experience - Conscious control	92
3.6	Perceptions during the first experience - Self-presentational concerns	93
3.7	Perceptions during the first experience - Inappropriate focus	93
3.8	Perceptions during the first experience - Negative thinking	97
3.9	Perceptions post first experience - Future performances	97
3.10	Perceptions post first experience - Reasons for not bowling now	99
3.11	Bowling experience post initial experience	101
3.12	The difference between the 'yips' and bowling badly	102
3.13	Characteristics of a good bowling performance	102
3.14	Personal characteristics	104
3.15	Personal explanations for why the 'yips' were experienced	104
4.1	The experimental set up for study two and three	133
4.2	Performance Scores for high and low self-conscious golfers in the 'conscious control' and 'do your best' conditions.	138
5.1	Performance scores for high and low self-conscious golfers in high and low stress conditions	154
6.1	Performance scores for high and low reinvestors for internal and external imagery conditions	177
7.1	Performance scores for each participant	196
8.1	The process of choking	219
8.2	The process of choking leading to the 'yips'	220

LIST OF TABLES

Table	Title	Page No.
3.1	Repertory grid produced by participant one	117
3.2	Construct correlation's for the example grid	118
3.3	Summary categories, order of ranking according to variance and frequency of use among the first eight constructs identified by the anchor analysis.	120
3.4	Hierarchy of construct types based on the frequency of use by bowlers.	121
3.5	Means and standard deviations for the elements (bowling standards) from each repertory grid	122
4.1	Means and standard deviations for the self-consciousness scale (study 2)	137
4.2	Means and standard deviations for putting performance	139
5.1	Means and standard deviations for the self-consciousness scale (study 3)	152
5.2	Means and standard deviations for golf-putting scores	153
5.3	Means and standard deviations for the anxiety rating scale (study3)	156
6.1	Means and standard deviations for putting performance	176
6.2	Means and standard deviations for the anxiety rating scale	178
7.1	Scores for pre-experimental questionnaires	194
7.2	Means and standard deviations of golf-putting scores at phase of the study	195
7.3	CSAI-2 – Intensity scores for cognitive anxiety, somatic anxiety and self-confidence	198
7.4	CSAI-2 – Direction scores for cognitive anxiety, somatic anxiety and self-confidence	199

LIST OF APPENDICES

Appendix	Title	Page No.
1	Flow Diagram of Thesis	2
2	Informed Consent Form for Study 1	4
3	Interview Guide for Study 1a	6
4	Transcribed Interview	8
5	The Self-consciousness Scale (SCS)	15
6	The Practical Assessment Questionnaire	17
7	The Anxiety Rating Scale (ARS)	19
8	The Reinvestment Scale	21
9	Imagery Instructions Used in Study 4	23
10	Competition Brief Used in Study 4	26
11	Vividness of Movement Imagery Questionnaire (VMIQ)	28
12	Competitive State Anxiety Inventory-2 (CSAI-2)	30
13	Imagery Log Book Used in Study 5	32
14	Statistical Analysis for Study 2	38
15	Statistical Analysis for Study 3	40
16	Statistical Analysis for Study 4	45

PEER REVIEWED WORK RELATED TO THIS THESIS

Publications :

Bawden, M.A.K. & Maynard, I.W. (1999). An investigation into the antecedents of the 'yips' in cricketers. Journal of Sport Sciences, 17 (12) 983-984.

Bawden, M.A.K., & Maynard, I.W., Graydon, J.K., & Chell, B. (2000). The effects of manipulated pressure and self-consciousness on golf putting performance. Journal of Sport Sciences, 18 (7) 552-553.

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GLOSSARY

Anxiety	The emotional impact or cognitive dimension of arousal.
Choking	The occurrence of inferior performance despite an individual striving for superior performance.
Conscious Processing	Reinvesting conscious control of movement when experiencing increases in anxiety.
Dystonia	A neurological movement disorder characterised by involuntary muscle contractions which force certain parts of the body into abnormal movements.
Pressure	Any factor or combination of factors that increases the importance of performing well
Reinvestment	A personality trait associated with conscious processing under stress.
Self-consciousness	A dispositional tendency to experience self-awareness in social situations.
Sport Performance Phobia	An irrational fear relating to a specific performance parameter which the performer was fully capable of executing prior to the phobic response.
Stress	A substantial imbalance between environmental demand and response capability, under conditions where failure to meet the demands has important consequences.
'Yips'	A motor phenomenon that consists of involuntary movements occurring in the course of the execution of finely controlled, skilled motor behaviour.

CHAPTER 1

1.0. INTRODUCTION

With the growth of interest in the psychology of sport, the effects of stress on performance have received particular attention in the academic literature (Jones & Hardy, 1990b; Orlick & Partington, 1988; Patmore, 1986; Scanlan, Stein & Ravizza, 1991). With the pressures that modern day sports performers experience, even carrying out the most simplistic task can be a potentially stressful experience and result in performance decrements. The professional golfer Jack Nicklaus described such an experience:

> "It doesn't take much technique to roll a 1.68 inch ball along a smooth, level surface into, or in the immediate vicinity of, a 4.5 inch hole. With no pressure on you, you can do it one-handed most of the time. But there is always pressure on the shorter putts.....90 per cent of the rounds I play in major championships, I play with a bit of a shake". (Patmore, 1986 p.75).

However, despite the wealth of research that has considered how stress negatively influences performance, little research has focused on the more severe performance problems experienced by individuals (Silva, 1994). Such problems can result in the long-term loss of skills that were previously carried out automatically. An example of such a severe performance problem is a phenomenon that has been called the 'yips'. The 'yips' is a long-term movement disorder that influences an individual's ability to carry out a desired motor skill (McDaniel, Cummings & Shain, 1989). These skills range from putting in golf, bowling in cricket, throwing in darts to cueing in snooker (Middleton, 1996). Golfers find that they putt with a shake, bowlers in cricket find they have little control over the direction of the ball, darts players find that they are unable to release the dart and snooker players cannot complete their cueing action. All of the descriptions of the 'yips' are clearly linked to physical disturbances, however whether these movement disturbances are physically or psychologically based has not been established in the academic literature (Smith et al., 2000). The

consequences of such a disorder have resulted in many sporting careers being cut short prematurely (Middleton, 1996). Patsy Fagan the snooker player was forced into early retirement (Dobson, 1998) and Keith Medlycott the cricketer had to stop competing just as his international career was beginning (Moody, 1993). Likewise, the golfer Bernard Langer has had to radically change his technique four times to try and combat the problem (White, 1993), and Eric Bristow experienced the 'yips' while he was the World Champion at darts (Dobson, 1998). After seven years of battling with the 'yips' Bristow managed to overcome the phenomenon. Bristow consulted psychologists and hypnotists to try and beat the problem. However, to this day he is not sure of how he managed to regain his ability, yet he believed the problem was purely psychological (Dobson, 1998).

The skills that the 'yips' usually affect tend to be straightforward simple tasks that, up until the onset of the response, the individual demonstrated no concern about performing (Smith et al., 2000). Much of the evidence for the 'yips' has been anecdotal and is well documented in many golf and cricket publications (Crews, 2001; Moody, 1993). Norman Gifford, a national cricket coach, described the problem of the 'yips' when stating :

> "The problem can start at any time in a player's career and the degree of the attack can vary. In some cases the natural rhythm of the bowler is upset.....in more serious cases the bowler is in such a state that he cannot even release the ball". (Moody, 1993, p.36)

However, in the academic literature the 'yips' has received very little attention. Few published research studies have specifically investigated the 'yips'. McDaniel et al. (1989) studied the 'yips' in golf from a neurological perspective. The authors concluded from their study that the 'yips' was a problem similar to an occupational dystonia. Thus, it was concluded that the phenomenon was primarily a physical rather than a psychological disorder. However, McDaniel et al. (1989) did make reference to two psychological constructs being influential in the 'yips'. They concluded that

anxiety increased the severity of the symptoms and that those who have experienced the 'yips' endorsed at least one item related to obsessional thinking.

A further study by Sachdev (1992) supported the findings of McDaniel et al. (1989). Sachdev (1992) examined golfers with and without the 'yips' on a number of psychological and psychiatric measures. The results indicated that there were no significant differences between the two experimental groups. It was concluded that the 'yips' were not an anxiety-based disorder and therefore were initiated by dystonia.

A recent study by Smith et al. (2000) has provided the most comprehensive explanation for the causes of the 'yips'. These authors concluded that the 'yips' represented a continuum on which anxiety related symptoms and dystonia symptoms were at the extremes. It was proposed that the majority of golfers experience the 'yips' due to an interaction of these two factors. Thus, Smith et al. (2000) acknowledge that psychological factors are an important aspect of the 'yips' experience.

Evidence for the 'yips' initially being a purely psychological disorder is scarce. However, Masters (1992) has proposed that the 'yips' is an extreme form of choking and is primarily anxiety based. Proposed interventions for the 'yips' have all tended to be concerned with behavioural modifications. Interventions have resulted in many golfers making drastic changes to their technique in order to regain their ability to perform. The golfer Sam Torrence believed that observing the problem in a fellow golf professional was enough to initiate the 'yips' in his own stroke. The only way that Torrence could combat the problem was to change his technique to putting with a pendulum style using a broom-handle putter (Chapman, 2001). Such behavioral modifications have offered some temporary relief, however most have resulted in a relapse to the jerks and tremors that they experienced previously (White, 1993). Such a failure to find long term answers to the 'yips' has resulted in many believing that there is no cure for the problem. Henry Longhurst the golf commentator once stated "Once you've had 'em', you've got 'em'" (Golf Digest, 1975).

From a psychological perspective the main theoretical model that has highlighted the underlying mechanisms associated with performance breakdown under pressure has been Baumeister's (1984) model of choking. The model suggests that when an individual experiences pressure, it leads to greater self-awareness. This increase in self-awareness then results in an attempt consciously to control movement and this focus of attention then disrupts performance. This model has been tested using basic co-ordination tasks, however it has not been fully tested using sport-specific protocols. It has been proposed that the 'yips' could be an extreme form of choking (Masters, 1992), therefore the links between the mechanisms that underpin choking (Baumeister, 1984) and those that underpin the 'yips' (McDaniel et al., 1989; Sachdev, 1992; Smith et al., 2000) need to be examined.

The main purpose of this research was to investigate the psychological mechanisms that underpin the 'yips' experience in sports performance. All of the published research acknowledge the existence of anxiety in the 'yips' experience (McDaniel et al., 1989; Sachdev, 1992; Smith et al., 2000), however, no studies have explored its role or how it interacts with other psychological variables. Thus, the aims of this thesis were to establish mechanisms that underpin the 'yips' experience (Study 1), to examine how the dominant mechanisms within the problem interact (Studies 2 & 3) and to establish coping strategies to counteract the 'yips' (Studies 4 & 5). A time line of the thesis can be seen in Appendix 1.

To date, no research studies have approached the problem of the 'yips' from a qualitative perspective. Therefore, an aim of the initial study in this thesis was to gain greater insight into the experience of the 'yips' from a personal perspective. This type of research provided many details about the 'yips' that could not be established though questionnaire based designs. The study highlighted many of the psychological mechanisms that were evident in the experience of the 'yips' and provided the basis for future studies that sought to test some of these mechanisms in group-based designs. The initial study also provided insights into the potential causes of the 'yips' and the subsequent experiences that make the problem long-term in nature. Furthermore, the 'yips' in sports other than golf, have received little or no coverage in

the academic literature. Therefore, the initial study in this thesis explored the experiences of cricketers.

The second part of the first study in this thesis attempted hierarchically to identify the most important characteristics of the 'yips' experience through the use of the repertory grid technique. Two dominant characteristics that emerged from the analysis were the personality trait of self-consciousness and the psychological mechanism of conscious processing (Masters, 1992). These two factors are major tenets of Baumeister's (1984) theory of choking. Therefore, these two factors were tested in further studies within the thesis.

Study two examined whether consciously controlling automatic skills was detrimental to performance. Furthermore, this was tested in golfers who were dispositionally high and those who were dispositionally low in self-consciousness. The study established that attempts to consciously control golf-putting technique were detrimental to performance. The study also established that both low and high self-conscious golfers experienced significant performance decrements when instructed to consciously control their movements.

Study three investigated Baumeister's (1984) choking theory in a golf-putting task. The study included golfers who were dispositionally high or low in self-consciousness and exposed them to low stress and high-stress conditions. The study found that golfers who were high in self-consciousness performed significantly worse than those low in self-consciousness. These findings failed to support the personality traits associated with Baumeister's (1984) model of choking. A further finding was that conscious processing was a major source of skill failure. These findings supported the conscious processing hypothesis (Masters, 1992).

Study four attempted to establish psychological techniques that could counteract conscious processing under stress. Within this study novice golfers were taught to use imagery from an internal or an external perspective whilst learning a golf-putting task. The study also included the further variable of reinvestment (Masters, Polman &

Hammond, 1993). Individuals who score high on the reinvestment scale are high in self-consciousness and are more likely to attempt to consciously control their actions under stress. Study four established that external imagery acted as a positive psychological technique to counteract conscious processing in individuals who were high in reinvestment.

Study five was a single-subject design intervention study. This study incorporated the findings from study four to provide an intervention package for golfers who experience the 'the yips'. Golfers with the 'yips' were required to make four feet putts in both stress and no stress conditions. It was established that golfers with the 'yips' could maintain their performance through the use of psychological skills, which help to counteract conscious processing when under stress. The findings from this study support those of Crews (2001) and provide an indication of the psychological skills that could combat choking and ultimately the 'yips'.

2.0. REVIEW OF LITERATURE

Much of the research that has been carried out within the sub-discipline of sport psychology has focused on how stress influences sports performance (Raglin & Hanin, 1999). Due to the pressures that modern day sports performers have to face, it is not surprising that researchers have conducted research to try and establish the sources of competitive stress and investigate how performers can cope with such stress (Scanlan, Stein & Ravizza, 1991). Many theoretical models have been developed to try and explain the relationship that exists between stress and performance. However, research that has focused on the extreme effects of stress and the long-term breakdown of automatic skills has not been so widely researched. One such long-term performance problem that affects automatic skills is the phenomenon that has been termed the 'yips' (Smith et al., 2000). This problem has had much anecdotal coverage in the popular press, yet in the discipline of sport psychology few investigations have considered the disorder. A primary reason for this lack of research has been born out of a lack of understanding as to the exact nature of the phenomenon and a lack of theoretical underpinning on which to base research protocols. Sport psychologists have made reference to the 'yips' in their research yet to date none have examined the problem directly (Masters, 1992).

Within the current research on the 'yips' phenomenon, two cognitive constructs that have been cited as being influential over performance have been attention and anxiety (McDaniel et al., 1989, Smith et al., 2000). Research and theory in these areas will now be discussed in relation to sports performance. The nature of these constructs and how they interact with each other will also be outlined. This analysis can provide a greater understanding of the factors that underpin the breakdown of sports performance. The theories chosen for discussion have been selected because they attempt to explain how performance can be influenced in stressful situations.

2.1. AROUSAL, ANXIETY, STRESS AND PERFORMANCE IN SPORT

Many theories have been proposed that attempt to explain the relationship between arousal and performance. A series of theoretical issues will be discussed that can provide an insight into how arousal can lead to dramatic decreases in sports performance. However, a long-standing problem in the study of the arousal-performance relationship has been the inconsistent use of terms associated with the models. In previous research arousal, stress and anxiety have been used interchangeably (Gould, Petlichkoff & Weinberg, 1984). However, a series of definitions have been outlined that distinguish between these terms.

Arousal has been described as general physiological and psychological activation that varies on a continuum from deep sleep to intense excitement (Gould & Krane, 1992). Martens (1987) defined arousal as "vigour, vitality and intensity with which the mind functions" (p.92). Thus, based on the work of Martens (1987) arousal has both physiological and psychological components.

Anxiety can be considered to be the emotional impact or cognitive dimension of arousal. Hence, anxiety has been viewed as the negative perception of high arousal (Gould & Krane, 1992). Martens (1977) suggested that anxiety would result from an objective environmental demand interpreted as threatening (a perceived imbalance between the demand and one's response capabilities) by an individual. Speilberger (1966) differentiated between anxiety as a mood state and anxiety as a personality trait. The state-trait anxiety theory (Speilberger, 1966) will be described in detail in the subsequent review of literature.

Stress has been defined by McGrath (1970) as "a substantial imbalance between (environmental) demand and response capability, under conditions where failure to meet the demands has important consequences" (p.20). Thus, stress is seen as a sequence of events leading to a particular response that may be positive or negative, depending on the individual's perception of environmental demands.

With the terms of arousal, anxiety and stress being used interchangeably in previous research, reference will be made to each of these terms in the review as specifically defined by the original authors.

The inverted-U hypothesis (Yerkes & Dodson, 1908) stated that there is an optimal level of arousal for every behaviour; values above and below are likely to create poor performances. It has been hypothesised that a curvilinear relationship exists between arousal and performance, with optimal performance occurring at a moderate level of arousal. Secondly, optimal arousal varies inversely with task difficulty; when an individual becomes 'over aroused' then their performance will deteriorate gradually. The Yerkes-Dodson 'Law' has received a great deal of criticism for describing rather than explaining the relationship between arousal and performance (Eysenck, 1985). Throughout the experience of the 'yips' individuals report experiencing a dramatic loss of ability to perform their skill. Such a description does not relate to the gradual decrease in performance described by the inverted-U hypothesis. Furthermore, the inverted-U hypothesis cannot explain the long-term effects of the experience of the 'yips'.

Drive theory (Hull, 1943) proposed that the relationship between performance and arousal was linked to the stages of learning and skill development. The theory could be explained by the linear relationship P (Performance) = H (Habit) x D (Drive). Habit represented the standard of skill that the individual had obtained and drive was the level of arousal that they were experiencing. Thus, in the early stages of learning where a skill had not reached automaticity, the habit (dominant response) would not be the correct response. Therefore, as arousal increases so the quality of the performance would deteriorate because the skill was not well learned. Later in the learning process, where the skill has been well learned the dominant response will be the correct one. For individuals at this stage of skill development increases in arousal should produce a higher quality performance. A further factor that needs to be considered is 'incentive value'. This aspect of the theory suggests that performance will only increase if the performer desires to perform the task. If an individual's 'incentive value' was low then performance improvements will not occur. Drive

theory has received much criticism when it has been applied to complex tasks such as those seen in sport (Martens, 1971, 1974; Fisher, 1976). The theory itself is too simplistic to explain behaviour in a sporting context and it is also very difficult to determine the habit hierarchy of correct and incorrect responses. Such limitations have made it problematic to test the theory in motor behaviour contexts. One aspect of drive theory that has relevance to the experience of the 'yips' is 'incentive value'. Individuals who experience the 'yips' tend to try and avoid further performance of the task, thus their 'incentive' to perform is low. However, further investigation of the relationship between the 'yips' and drive theory tends to highlight a number of problems. It has been documented that the 'yips' can occur in any standard of sports person including elite performers (Moody, 1993). Hence, for the elite performer who experiences the 'yips', increased arousal should help them to produce the dominant response and subsequently improve performance. McDaniel et al. (1989) suggested that anxiety made the symptoms of the 'yips' worse and thus debilitated performance. Therefore, drive theory does not adequately explain the mechanisms associated with the experience of the 'yips'.

Hanin (1980) proposed the zone of optimal functioning as a theory to explain the anxiety-performance relationship. Hanin (1980) suggested that each individual has their own zone at which their arousal will produce optimal performances. Empirical research has been provided to suggest that individual zones of optimal functioning can predict sports performance (Gould & Tuffey, 1996; Turner & Raglin, 1991). Despite this theory being anecdotally encouraging, theoretically it has many weaknesses. Firstly it is a unidimensional theory and thus does not take into consideration the other components of the anxiety response. Secondly, due to each individual having their own specific zone in which optimal performance can be obtained, the theory essentially is individual specific and therefore is not comparable across sports performers (Gould & Tuffey, 1996). A multidimensional approach to the study of zones of optimal functioning has been developed in recent work, yet only limited support for this has been established (Krane, 1993; Scallen, 1993).

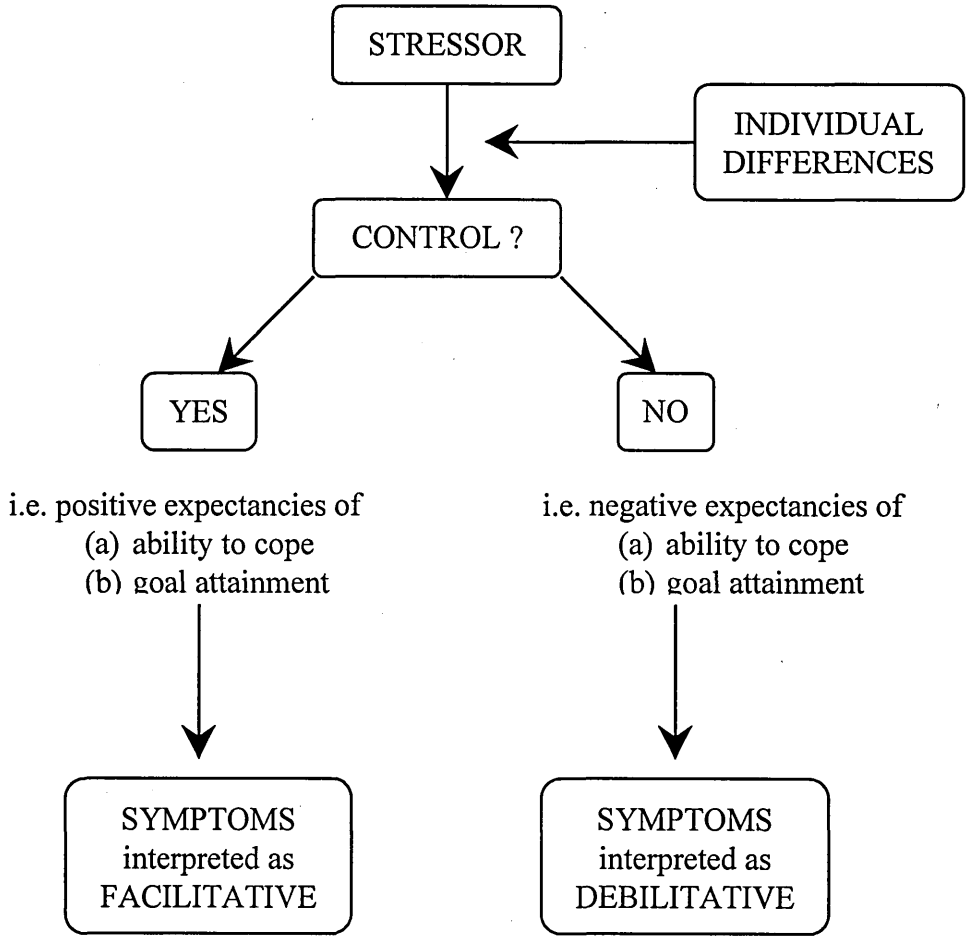
Liebert and Morris (1967) were the first to state that anxiety was not a singular construct but was multidimensional in nature. Two constructs were proposed to describe the experience of test anxiety: worry and emotionality. Worry refers to the cognitive elements of anxiety, such as negative thoughts and expectations. Emotionality refers to physical arousal such as tension and nervousness. Davidson and Schwartz (1976) coined the terms cognitive and somatic anxiety. Cognitive anxiety refers to the conscious awareness of unpleasant feelings. Somatic anxiety refers to physiological arousal (Davidson & Schwartz, 1976). This differentiation of anxiety responses is important in sport because they are also seen to have different relationships with performance (Burton, 1988; Martens, Burton, Vealey, Bump & Smith, 1990). It has been predicted that a negative linear relationship exists between cognitive anxiety and performance. Somatic anxiety has been predicted to have an inverted-U shape relationship with performance, while self-confidence, which was highlighted in the development of the competitive state anxiety inventory - 2 (CSAI-2), was thought to be the antithesis of cognitive anxiety (Martens et al. 1990). The questionnaire was developed as a multidimensional measure of state anxiety. It has been used extensively in sport psychology research and has displayed appropriate construct validity and reliable internal consistency (Jones & Cale, 1989; Martens et al., 1990). Despite the fact that clear distinctions have been drawn between cognitive and somatic anxiety, it has been proposed that these two components may interact with each other (Borkovec, 1976). Thus, cognitive anxiety in the form of worry can cause somatic responses such as increased heart-rate and increased sweating. Likewise, somatic responses can also initiate negative cognitions.

A further development in the anxiety literature sought to determine how individuals perceived their anxiety symptoms rather than simply measuring anxiety intensity. The concept of anxiety interpretation was well established in the mainstream psychology literature (Alpert & Haber, 1960). However, recently this idea has been applied to theories associated with sport psychology (Jones, 1991; Parfitt, Jones & Hardy, 1990). To establish whether individuals perceived their anxiety symptoms as being facilitative or debilitative, the CSAI-2 was modified to include a directional scale. Carver and Scheier (1988) suggest that anxiety is perceived to be facilitative as

long as the individual's expectations of coping with the situation and goal attainment remain favourable. When either of these components is lacking then anxiety becomes debilitative. Such a position is particularly relevant to the experience of the 'yips' in which individuals lose their belief in their ability to perform the skill and subsequently attempt to avoid performing it. Jones (1995) modified Carver and Scheier's (1988) model and adapted it more directly to sport (see Figure 2.1).

Catastrophe theory has attempted to model the multidimensional aspects of anxiety (Fazey & Hardy, 1988). This paradigm originated as a mathematical model (Thom, 1975) and has been applied to sports performance (Fazey & Hardy, 1988). The theory looks more specifically at the role of competitive state anxiety on performance. Anxiety was seen to be the maladaptive emotional or cognitive reaction to arousal of the autonomic nervous system (Landers & Boutcher, 1986). The catastrophe model proposed that when an individual experiences high levels of physiological arousal coupled with high cognitive anxiety they will lead to a dramatic decrease in performance. Such a catastrophic decrease in performance is far more severe than the performance decrements associated with the inverted-U hypothesis. Once the individual has experienced this severe decrement then performance can only be regained by a large reduction in physiological arousal. The model also suggested that increases in cognitive anxiety will have a beneficial effect on performance when levels of physiological arousal are low. Only limited support has been provided for catastrophe theory due to the complex nature of the model when applied to sport (Hardy, 1996; Hardy & Parfitt, 1991; Krane, 1990). Despite such criticisms, catastrophe theory does more accurately explain the extreme decrease in performance experienced by individuals who have the 'yips'. Many performers who experience the disorder describe feelings of uncontrolled physical tension and somatic anxiety, thus the notion of having substantially to reduce physiological arousal to regain performance seems relevant to the 'yips' phenomenon. Catastrophe theory could help to explain the role of anxiety as an underpinning process in the problem. However, it cannot explain how the 'yips' becomes a long-term disorder or whether the long-term nature of the problem is in fact anxiety based.

Figure 2.1 – A Control Model of Facilitative and Debilitative Competitive Anxiety (Jones, 1995)



Criticisms have been made of catastrophe theory for not considering the factor of self -confidence and also the facilitative and debilitative nature of anxiety. However, Hardy (1990) has proposed a higher order model called the butterfly catastrophe model. This model is five dimensional and suggests that self-confidence increases the probability that individuals who are cognitively anxious will be able to sustain performance even when experiencing high levels of physiological arousal. Limited support has been proposed for this model, yet it could provide a much more complete explanation of the anxiety-performance relationship (Hardy, 1996).

A further concept that has been applied to sport has been termed reversal theory (Kerr,1985; Smith & Apter, 1975). The theory was originally developed by Smith and Apter (1975) in the mainstream psychology literature and has received considerable attention in sport psychology research (Kerr, 1985, 1987). The basic tenet behind reversal theory is related to an individual's interpretation of their arousal. Thus, a link exists between reversal theory and directional perceptions of arousal. Within reversal theory high levels of arousal could be interpreted as excitement, this would be perceived as pleasant to the individual and therefore facilitative. Conversely, an individual could perceive the same level of arousal as anxiety and therefore would interpret the experience as unpleasant. Whether an individual interprets arousal to be pleasant or unpleasant is defined as the hedonic tone. Reversal theory suggests that two curves describe the relationship between arousal and affective pleasure. These curves represent two very different metamotivational states. The first of these is the telic state, in which the individual has a more serious mindset and has a desire for achievement and feelings of progress. In contrast to this, the paratelic state tends to be more playful. In this state the activity seems to be engaged in for its own sake. The theory suggested that individuals can switch from one curve (state) to the other based on their interpretation of a situation. Thus, it is suggested that as individuals go through their lives they move through qualitatively different states. Hence, a situation that was interpreted as highly pleasurable can suddenly be perceived as anxiety inducing and unpleasant.

Kerr (1985) has applied reversal theory to sport. This application to sport has resulted in four quadrants evolving: anxiety, excitement, boredom and relaxation. In a telic state low arousal is experienced as relaxation, whereas high arousal is experienced as high levels of anxiety. In a paratelic state, high arousal is pleasant and experienced as excitement, low arousal results in feelings of boredom. The nature of reversals between these two polar states are thought to be involuntary and are largely unexpected (Kerr 1987). Research to support the ideas presented by reversal theory as applied to sports performance has been equivocal (Kerr, Yoshida, Hirata, Takai & Yamazaki, 1997). The basic concept behind reversal theory does seem to have some relevance to the 'yips'. For example individuals can start to experience extreme anxiety when performing a task that prior to the onset of the problem had not been anxiety inducing. The interpretation of their anxiety state also becomes more focused on the negative effects of anxiety. The idea that 'reversals' between states are usually unexpected and involuntary may also have some relevance to the 'yips' phenomenon. Individuals who experience the problem tend to have no perception that the problem is going to happen until it actually occurs, therefore it is highly unexpected and involuntary (McDaniel et al., 1989; Sachdev, 1992).

Humphreys and Ravelle (1984) developed a model of arousal and performance that attempted to combine the effects of personality and motivational variables on performance using two arousal systems. These two systems were called arousal and on-task effort. The definition of on-task effort involved the allocation of available attentional resources. The model predicted performance for two types of task; sustained information transfer tasks, and short-term memory tasks. The model predicted that arousal induces progressive improvements in performance for sustained information tasks and the opposite for short-term memory tasks. The authors suggested that 'impulsivity' was a crucial personality variable when investigating the arousal-performance relationship. Impulsivity was a combination of extraversion and neuroticism. Thus, individuals high in impulsivity tend to act without consideration and somewhat recklessly. The authors also suggested that low impulsives tend to be more vulnerable to experiencing high arousal early in the morning, whereas high impulsives tend to be more prone to high arousal early in the evening (Eysenck, 1982;

Humphreys & Revelle, 1984). The effects of experiencing this over-arousal is more pronounced when the task has a large memory demand. Humphreys and Ravelle's (1984) model of arousal and performance could have some relevance to the 'yips' because it includes the effects of personality and motivation on performance. It has been suggested that individuals with certain personality traits could have a greater disposition to choking in sport (Baumeister, 1984). Hence, the relationship between personality, perceptions of arousal and the 'yips' in sport needs to be further investigated.

The previous theories have attempted to describe and explain the relationship that exists between anxiety and performance. To further understand the influence of anxiety on performance, it is important to describe both the components and the antecedents of anxiety.

Spielberger (1966) was the first to highlight a distinction between state and trait anxiety. State anxiety was defined as

> "subjective, consciously perceived feelings of tension and apprehension and tension..... associated with arousal of the autonomic nervous system." (p.17)

Speilberger (1966) defined trait anxiety as

> "a motive or acquired behavioural disposition that predisposes an individual to perceive a wide range of objectively non-dangerous circumstances as threatening and respond to these with state anxiety reactions disproportionate in intensity to the magnitude of the objective danger." (p.17)

Thus, individuals who have high trait anxiety perceive more situations as threatening and respond to threatening situations with more intense levels of state anxiety.

Research into the contributing factors of anxiety on performance was conducted by Simon and Martens (1977). Their research found that competitive state anxiety was higher in individual sports compared to team sports, and in contact sports compared to non-contact sports. Scanlan and Passer (1978) highlighted three predictors of state anxiety, those being trait anxiety, self-esteem and performance expectancies. Kroll (1979) identified sources of psychological stress. The sources of stress experienced by adults were: fear of failure, feelings of inadequacy, loss of internal control, guilt, and current physical state. Gould and Weinberg (1985) conducted a study in which they interviewed wrestlers about their perceptions of the stress that they experienced. The most prominent sources of stress were: worry about not performing well, trying to improve on the last performance, what the coach will think or say about their performance, not performing up to their desired level, losing, and the performer's physical condition. The same sources of stress were identified by Feltz, Lirgg and Albrecht (1992).

Recent research into the antecedents of multidimensional anxiety has focussed on those factors that influence cognitive anxiety, somatic anxiety and self-confidence. The antecedents of cognitive anxiety and self-confidence are factors that influence the performer's expectations of success (Hardy, Jones & Gould, 1996a). Cognitive anxiety and self-confidence share some common antecedents, yet also possess unique sources. The antecedents of somatic anxiety are hypothesised to be non-evaluative and are not related to a performer's expectations of success. Hanson (1967) and Lowe and McGrath (1971) have highlighted contradictory findings for the antecedents of somatic anxiety. They proposed that the sources of somatic anxiety are related to aspects of competition such as seeing opponents warming up or entering the venue in which the competition is to take place.

Jones, Swain and Cale (1990) established that cognitive anxiety was predicted by a performer's perceived readiness to perform, their attitude towards previous performances and their use of outcome goals. Cognitive anxiety was said to be positively related to goal difficulty and negatively correlated to the individual's perception of whether they could achieve the goal. The major contributing factors for

self-confidence were considered to be perceived readiness to perform and the external environment. Further research by Jones, Swain and Cale (1991) has highlighted the different antecedents of anxiety in males and females. They established that readiness to perform, and the importance of doing well, mainly determined the cognitive anxiety and self-confidence of females. For males the major sources of cognitive anxiety and self-confidence were their perceptions of their ability and their probability of winning.

2.2. PERFORMANCE ANXIETY

Anxiety has been investigated in many different performance environments. In the 'arts' anxiety has been termed 'performance anxiety'. The study of performance anxiety and its more extreme consequences, that of 'stage fright' show some similarities to the 'yips' experience.

Performance anxiety involves both cognitive and attentional focus on the individual's own performance; these cues are especially related to failure and thus can have extreme effects on the skill being attempted. One of the major effects of performance anxiety in musicians has been identified as the breakdown of specific motor skill sequences. It is suggested that once an individual learns a specific motor skill it no longer requires the level of self-conscious attention that it required originally. Kimble and Perlmutter (1970) stated that skills that are highly practiced will recede from consciousness and subsequently become involuntary.

The process that an individual goes through as they perfect a skill results in the attention being taken away from skill execution and being placed on other more finely tuned aspects of performance such as style. Thus, a complex skill is less susceptible to voluntary control as it is perfected. Problems occur in the execution of the skill when the individual perceives fear of failure in its execution (Fogle, 1982). This fear of failure results in several responses, the initial response is a physiological one. Such responses include excessive or inappropriate tension in certain muscle groups, this could obviously work against the smooth, precise movements required to perform a

skill. On a cognitive or attentional level the fear of failure involves a disproportionate focus on negative eventualities that would reflect on the technical aspects of performance. Thus, Fogle (1982) suggested that performance anxiety tends to de-automise performance in musicians, this was due to a more self-conscious form of playing.

Fogle (1982) investigated effective treatments for music performance anxiety. Fogle (1982) stated that performance anxiety initiates a 'trying too hard effect', this disrupts automatic behaviour owing to a need to avoid making mistakes. With respect to interventions to alleviate performance anxiety, Fogle (1982) suggested that cognitive and attentional interventions could be used. Such interventions would involve cognitive desensitization, applied relaxation, the use of positive self-statements, mental imagery and then in vivo performance. Fogle (1982) highlighted the work of Gallwey (1974) and his thoughts on the cognitive and attentional factors in complex motor performance. Gallwey (1974) applied his ideas to tennis performers and suggested that the player should return to a more automatic or natural functioning through a non-judgemental awareness of performance, regardless of errors. The basis of the Gallwey approach was to take the performer's attention away from catastrophic expectations and negative self-talk towards performance-relevant cues.

Fogle (1982) concluded that strategies used to deal with phobic anxieties are not appropriate for extreme performance anxiety despite the symptoms being similar. He further suggested that the anxiety which affects the execution of a skill was similar for any kind of activity where the performer experienced self-consciousness about their performance. He concluded that intervention techniques used to lower performance anxiety in music could be equally beneficial in areas such as sport.

Newark and Hochberg (1987) investigated the breakdown of performance in fifty-seven elite musicians. The participants all experienced isolated painless manual incoordination when playing. The symptoms described by musicians were very similar to those seen in the 'yips' in sport. Musicians reported involuntary movement of the upper limbs, these movements were activity-specific and non-progressive. The

authors concluded that the phenomenon was a focal dystonia and was not related to performance anxiety. However, throughout their study no psychological measures were taken, hence these conclusions should be treated with caution.

The experience of performance anxiety in musicians has led to the more serious long term disorder known as stage fright (Steptoe & Fidler, 1987). Musicians and actors who have stage fright tend to experience trembling, hyperventilation and nausea. In severe cases this results in the termination of their career. Lehrer (1981) found that stage fright in musicians decreased with their years of experience of performing. However, Hamann (1982) found no relationship between years of study and the level of performance anxiety experienced in music students. Steptoe and Fidler (1987) conducted a study to establish whether performance anxiety generally decreased with years of experience. They also sought to establish whether individuals who experience stage fright were more prone to psychological difficulties such as phobias and test anxiety. It was hypothesised that performance anxiety and stage fright might be more common in individuals with a neurotic disposition. The second objective of the study was to consider the cognitive processes that exist in performance anxiety. Test anxious individuals report many task-irrelevant thoughts, worrying about performance, preoccupation with feelings of inadequacy and anticipation of loss of status, together with distraction by perceived somatic arousal (Wine, 1971). A further aim of the research was to try and identify cognitive coping strategies used by musicians with and without stage fright. The authors found that performance anxiety was related to neuroticism and everyday fears, specifically social situations. The individuals who were able to cope with performance anxiety used a series of cognitive strategies; these included having a realistic perception of performance quality (with the likelihood that some mistakes will be made) and having a positive attitude towards the audience.

Steptoe and Fidler (1987) suggested that the most important self-statements related to stage fright were more likely to relate to performers imagining themselves making mistakes, or fear due to a loss of control whilst performing. Ellis (1977) identified catastrophising as a core element of the pattern of maladaptive, irrational beliefs

associated with anxiety. It was concluded that individuals suffering from the symptoms of performance anxiety and stage fright needed to have realistic performance expectations and interpretation. They also needed to develop a more positive attitude towards the audience and, hence, needed to be less self-conscious.

Barrell, Medeiros, Barrell and Price (1985) investigated the causes of performance anxiety in musicians. They established five causal elements for the problem, these included; the perceived presence of significant others, the possibility of visible failure, the need to avoid failure, uncertainty of the outcome and focus on the self. To counteract these causal elements the authors suggested that performers should focus on process rather than outcome goals, the goals should be focussed on a positive approach to performance and that they should focus on self-acceptance and not self-doubt.

2.3. SELF-AWARENESS AND SELF-CONSCIOUSNESS

Much of the literature that has investigated the breakdown of automatic skills has considered two further factors that have the potential to influence performance. These factors are an individual's focus of attention and also their self-awareness whilst performing. Innes and Young (1975) defined self-awareness as a state in which 'the subjects attention is directed towards the self, and where there will be a comparison of the self with standards of correctness' (p36).

Duval and Wicklund (1972) proposed a theory of self-awareness in which they stated that attention can be directed outward toward the environment, or inward towards the self. Whilst performing the highly self-aware person can become more conscious of their own presence, attributes and feelings. Duval and Wicklund (1972) suggested that when a person is self-aware they become more likely to evaluate their behaviour in terms of its standards and correctness. If the individual's behaviour does not match up with the standard then a negative affect is generated. A self-aware individual will attempt to reduce this affect to a greater extent than when they are not self-aware. The theory states that when individuals are more self-aware their performance should

improve. Such a theoretical perspective failed to support the work of Carver and Scheier (1981) who view self-awareness as a potentially negative factor. Carver and Scheier (1981) suggested that attending to oneself whilst performing can take attention away from task relevant information, thus having a negative outcome on task performance. There have been many connections made between self-awareness and an individual's self-consciousness. It has been proposed that attention towards the self is a component part of dispositional self-consciousness (Fenigstein, Scheier & Buss, 1975).

Self-consciousness has been defined by Christensen (1982) as a 'dispositional tendency to experience self-awareness in social situations' (p177). Fenigstein et al. (1975) developed a scale to assess individual differences in self-consciousness. The validation of the tool revealed that self-consciousness had three components: public, private and social anxiety. The private self-consciousness subscale measured an individual's self-focus. Persons scoring high on this subscale were more aware of their feelings, thoughts, moods and attitudes. The public self-consciousness subscale measured an individual's awareness of the publicly displayed aspect of self. The third component was social anxiety, which represented a person's reaction to being focused on by others. Carver and Scheier (1978) conducted some early research into self-awareness using the self-consciousness scale (SCS). The authors also attempted to establish which variables could be manipulated to enhance self-awareness on a sentence completion task. They concluded that having to perform in front of a mirror or an audience heightens self-attention. They also established that the private subscale of the SCS does measure self-attention.

Dickstein, Wang and Whitaker (1981) have demonstrated that both the private and public self-consciousness subscales were significantly correlated with trait anxiety as measured by the state-trait anxiety inventory (Speilberger, Gorsuch & Lushene, 1970). Wells (1985) established that individuals high in private self-consciousness report higher state anxiety in anxiety provoking situations. These findings were consistent with those of Wine (1971) who suggested that poor task performance of highly test anxious individual's results from a distracted attentional focus. Hope,

Gansler and Heimberg (1989) have found a positive relationship between public self-consciousness and social anxiety, however, this was only found in socially anxious participants. They also found that public self-consciousness and social anxiety were unrelated in non-anxious subjects.

Further research by Hope and Heimberg (1988) has established that high self-consciousness is strongly related to individuals who suffer from social phobia. Makris and Heimberg (1995) studied the relationship between maladaptive self-consciousness and social phobia. Within the investigation the authors tested the Scale of Maladaptive self-consciousness (SCONS) (Christensen, 1982). This scale furthered the work of Fenigstein et al. (1975) to focus a measure of self-consciousness purely on the negative aspects. Makris and Heimberg (1995) found that individuals who suffered from social phobia exhibited higher maladaptive self-consciousness than non-anxious participants. The authors also found that among social phobics, maladaptive self-consciousness was associated with greater social anxiety, more avoidance of feared situations, greater severity of phobic symptoms and a maladaptive attributional style. Christensen (1982) explored the relationship between dispositional self-consciousness and interpersonal effectiveness. She found that the behaviour of individuals who were high in maladaptive self-consciousness was associated with ineffective social behaviour, reduced sensitivity to the person being interacted with and a heightened self-perception of inadequacy. Individuals who were low in self-consciousness appeared to be insensitive to the people being interacted with due to the fact that they were relatively unconcerned with what others think of them and thus were not attuned to subtle behaviours that reflect these reactions. She concluded that individuals who are high in self-consciousness experience self-awareness to the point that it interferes with their social functioning. Moderately self-conscious individuals performed the best in social interactions because they are concerned about how others evaluate them, yet are not so pre-occupied with this that they cannot focus adequately on external events.

The findings from the clinical literature have found considerable support for a relationship between social anxiety, social phobia and high self-consciousness (Hope

& Heimberg, 1988). These findings could have implications for individuals who experience similar phobic symptoms in sporting scenarios. This link has been made by Silva (1994) who has investigated sports performance phobias, a condition that has many similarities to the 'yips'.

Much evidence has been provided to suggest that when an individual is under stress their self-consciousness increases due to higher levels of arousal (Fenigstein & Carver, 1978; Wegner & Giuliano, 1980). Many evaluative situations have been shown to induce a state of self-focus in individuals through the means of external influences such as, the presence of a camera or mirror (Carver, 1974; Davis & Brock, 1975).

To fully establish the relationship between anxiety, attention and the breakdown of automatic skills, it is necessary to highlight theoretical models that have looked at how these variables interact with each other and ultimately affect performance.

2.4. ATTENTION AND AUTOMATICITY

When sports performers reach a high level of competency then the skills they perform can become automatic. When performers reach this level of automaticity, they can perform the task without the use of attentional resources. Automatic functioning is fast, can be carried out whilst processing other tasks and is largely involuntary (Schmidt, 1988). One major limitation to automatic processing is that once a skill has reached this stage of development, it is very hard to change. Controlled processing is more flexible than automatic processing, yet it takes a greater time to process due to attentional demands (Eysenck, 1982). When executing an automatic skill cognitive psychologists would argue that an individual's mode of motor control is open loop in nature (without feedback). Such a mode of control can be detrimental to performance as there is spare attentional capacity with which to process external task-irrelevant information. A further complication is that individuals can try to devote controlled attention to the automatic skill. Such a situation results in automatic skills being disrupted (Langer & Imber, 1979). It is this spare attentional capacity and the

disruption of automatic processing through controlled attention which is of interest when looking at the breakdown of automatic skills in a sporting context. A further area of interest involves the identification of the factors which lead the elite performer to attempt to try and consciously control automatic skills.

Masters (1992) proposed the conscious processing hypothesis. This hypothesis states that performers attempt to reinvest conscious control of their movements when they experience increases in anxiety. This conscious control of movement is created through a focus on explicit knowledge rather than performing the skill automatically. This position on skill failure under stress is contradictory to that of Baumeister (1984) who proposed that performance decreases due to a lack of awareness of explicit knowledge. A study that investigated the conscious processing hypothesis was conducted by Masters (1992). Masters (1992) looked specifically at the way skills are learned and whether this influences their breakdown under stress. Masters (1992) suggested that a skill can break down due to the conscious processing of explicit knowledge related to that skill. It was also proposed that if the individual was not aware of explicit knowledge related to that skill, then disruption to the processing of that skill should be avoided when placed in a stressful situation. Masters (1992) made the connection between this breakdown in automatic processing and the 'yips' experienced in sport when he stated:

> "Reinvestment of controlled processing in automatic skill may explain choking, and indeed, may explain more severe forms of choking, such as 'dartitis' or the feared 'yips'". (p. 345).

The study carried out by Masters (1992) required novices to be placed into one of five learning conditions. The task used in this investigation was a golf putt. The learning conditions were: implicit learning, explicit learning, implicit learning control, stressed control and non-stress control. The participants were required to make four hundred practice putts in their experimental condition and then perform one hundred putts in a test condition. The implicit group carried out articulatory suppression (a technique used to stop explicit learning) during all practice trials. The experimental hypothesis

was that those participants who learned the skill implicitly (without knowledge of rules) would be less likely to experience a breakdown in performance when under pressure. The results of the study provided evidence that an implicitly learned skill was less likely to fail under pressure than an explicitly learned skill. These findings were accounted for by suggesting that individuals who learned the skill explicitly would use this explicit knowledge to try and control the skill under pressure. Such a focus of attention leads to 'deautomatization', by 'reinvesting actions and percepts with attention' (Deikman, 1969).

Within this study participants were also required to fill out a Cognitive Failures Questionnaire (Broadbent, Cooper, FitzGerald & Parkes, 1982). This measure assesses the tendency to have slips in action (when automatic skills breakdown). It was suggested that if such slips are the result of an inherent flaw in automatic processing, then under pressure the disruption of automaticity is the result of the same flaw. However, only eight participants were eligible for the correlation between changes in performance under stress. They suggested this relationship was a concept that needed to be studied in the future.

Further support for the conscious processing hypothesis has come from Hardy, Mullen and Jones (1996b) who replicated the Masters (1992) investigation. These researchers suggested that the conclusions drawn by Masters (1992) could have been limited because the implicit learning group were not required to perform articulatory suppression during the stress trials. Therefore, the implicit learning group could have continued to improve their performance simply because they were executing a simpler task. Within this study a further experimental group was included, in which participants were required to carry out articulatory suppression during the stress trials also. It was hypothesised that this new experimental group would experience the same breakdown in performance as the explicit learning group. The results of the study failed to support this hypothesis as the new implicit experimental group did not experience disruption in performance. The study provided further support for Masters' (1992) conscious processing hypothesis. A criticism of the Hardy et al. (1996b) study was that the explicit learning group did not experience a detrimental

effect on their putting performance. In the stressful condition the explicit learning group's performance was maintained. It appears that the explicit learning results could be explained by a ceiling effect. The implicit learning groups were in effect experiencing a harder task because they were having to carry out articulatory suppression whilst performing. It is plausible that these participants were simply learning at a slower rate and that given another practice session they would have experienced the same ceiling effect regardless of pressure.

Research by Mullen and Hardy (2000) has further tested the conscious processing hypothesis (Masters, 1992). The authors also took Eysenck's processing efficiency theory into account. The authors tested whether implicit learners, who acquired the skill of golf-putting whilst generating random letters, became desensitized to self-generated verbalizations and thus became immune to the effects of competitive anxiety. The authors also examined the effect of increased state anxiety on the movement kinematics during skill failure. The participants were required to putt on a three metre incline in three conditions. The three conditions were: task-relevant, task-irrelevant and a control condition. In the task-relevant condition, the participants used task-relevant instructions to guide their performance. These task-relevant instructions were included to encourage lapses into conscious processing. In the task-irrelevant condition the participants were instructed to generate random letters every second as they putted. In the control condition the participants simply putted as they would normally. For the analysis of this study golfers were separated into 'better' and 'poorer' putters. During each testing condition a video camera recorded each participant's putting technique for kinematic analysis. It was hypothesised that increases in cognitive anxiety would result in the largest performance decrements, when the performers putted using task-irrelevant knowledge. The findings of this study were that differential performance effects found in the high anxiety task-relevant and task-irrelevant conditions offered support for the conscious processing hypothesis, above attentional threshold explanations. However, the authors concluded that neither the conscious processing hypothesis or processing efficiency theory could fully explain the behaviour of anxious performers under stress. It was proposed that other factors need to be included when investigating skill failure, such as 'effort' and

'expectations of success'. The kinematic analysis failed to provide evidence that would indicate which processes break down as a result of deautomatization. The authors concluded that the use of task-relevant knowledge by anxious and skilled performers could have harmful results on performance. As a result of these findings the role of process orientated goals (Kingston & Hardy, 1994) can be questioned. Having a process orientated perspective could lead to a focus on explicit knowledge of skilled behaviour and subsequently result in conscious processing and ultimately deautomatization when experiencing stress.

The link between the conscious processing hypothesis (Masters, 1992) and processing efficiency theory (Eysenck, 1992) has been made by Hardy and Woodman (2001). The processing efficiency theory (Eysenck, 1992) suggests that cognitive anxiety has two main functions in the stress and performance relationship. The first of these is that increases in cognitve anxiety results in 'worry' taking up attentional resources, resulting in decreased attentional capacity for the task. The second factor involves increases in effort. Eysenck (1992) suggests that anxious individuals will invest more effort if they perceive that their performance is below expectations. However, if the demands of the task are considered to be too great, then the individual will attempt to withdraw. Alternatively participants could increase their effort to such an extent that they lapse into conscious processing (Masters, 1992). Hence, Woodman and Hardy (2001) suggest that dramatic decreases in performance under stress could be explained through a withdrawal of effort or by effort-induced lapses into conscious processing. Thus, processing efficiency theory can be seen as a mechanism by which an individual can reinvest conscious processing when under stress.

Masters et al. (1993) developed a reinvestment scale to assess the link between personality characteristics and conscious processing under stress . The scale was constructed to assess whether 'reinvestment' could be considered a personality trait. The scale was developed from a number of measures, the private and public self-consciousness Scales (S-CS) (Fenigstein et al., 1975), the Cognitive Failures Questionnaire (CFQ) (Broadbent et al., 1982) and the rehearsal factor of the Emotional Control Questionnaire (ECQ) (Roger & Nesshoever, 1987).

Components of the CFQ questionnaire were used as it was suggested that a greater predisposition to cognitive failure increases vulnerability to stress. Aspects of the ECQ questionnaire were involved because one of the components assessed was 'rehearsal', rehearsal being described as the tendency to mentally rehearse emotional events. It would seem there are similarities between rehearsal and conscious control of movement that involves the conscious rehearsal of skilled components. The S-CS was also included to assess individual differences in self-awareness. It was proposed that aspects of this questionnaire were important, as self-awareness was considered to be a further component of reinvestment (Masters et al.,1993).

Four studies were carried out using the reinvestment scale (Masters et al., 1993), which had high test-retest reliability. The first study required both high and low reinvestors to carry out a rod-tracing task. The participants experienced a learning phase in which the task was developed to an asymptotic level. Following the learning phase a pressure phase was introduced. The results of this study did not support the hypothesis that high reinvestors would be more likely to reinvest under pressure. A possible reason why these results were obtained was explained by the fact that the task was not complex enough. In a second study, Masters et al. (1993) used the more complex task of golf-putting. Using this technically based skill, evidence was provided to suggest that high reinvestors were more likely to fail (experience performance decrements) under pressure. Such findings are contradictory to those of Baumeister (1984) who suggested that low self-conscious individuals would be more prone to performance debilitation through reinvestment.

Masters et al. (1993) cite the concept of 'composition' (Neves & Anderson, 1981) during the development of automaticity as being an important contributor to the reinvestment process. Composition is the chunking of information to form single representations of action. It was proposed that pressure results in 'decomposition' of single representations and therefore the individual regresses back to simpler mechanisms of control. Such a disruption results in the failure of skill acquisition. Logan's (1988) 'Instance' theory was also suggested as an explanation for how skills break down through reinvestment. Within this theory stress is thought to result in a

return to an explicit algorithmic-based control of behaviour; such a form of control results in skill disruption. Masters et al. (1993) concluded that the reinvestment scale assesses reinvestment of controlled processing and could be used as a tool to predict skill failure under pressure.

Langer and Imber (1979) proposed that overlearning a skill leads to mindlessness which could subsequently result in the breakdown of that skill. Thus, the components of a well-learned task becomes inaccessible to consciousness. Langer and Imber (1979) suggested that individuals who have overlearned a task may no longer have a recollection of how the task was performed. Thus, if an individual has overlearned a skill and then their ability was subsequently put into question, they could then find it hard to recollect exactly how the task was performed. It was also proposed that individuals who consciously monitor their finger movements during typing suffer a detrimental effect on their performance (Langer, 1978). Likewise, Keele (1973) established that paying conscious attention to hand movements during piano playing resulted in detrimental performance effects. Theoretically the findings of Langer and Imber (1979) support those of Masters (1992) as they both state that attempting to consciously control automatic skills is detrimental to performance. However, their explanations as to why this is detrimental to performance are very different. Langer and Imber (1979) propose that consciously controlling skills is detrimental due to an absence of explicit knowledge, whereas Masters (1992) states that performance decreases due to a focus on explicit knowledge. Therefore, theoretically Langer and Imber (1979) and Masters (1992) are in agreement, however, their views differ when considering the mechanisms of skill failure. Theoretical explanations for the breakdown of automatic skills include the Progression-Regression hypothesis (Fitts, Bahrick, Noble & Briggs, 1961). This hypothesis proposed that as an individual learns a skill and it becomes automatic, so the individual progresses to more complex control strategies. These control strategies regress to simpler control when the individual experiences pressure.

2.5. THE ATTENTION - ANXIETY RELATIONSHIP

Some theoretical perspectives have attempted to describe and explain the arousal performance relationship and how this interlinks with attention. Theoretical models that have attempted to explain this relationship include Easterbrook's (1959) Cue Utilisation theory and Wine's (1980) Limited Capacity explanation.

Easterbrook (1959) produced a hypothesis that attempted to explain the Yerkes-Dodson 'Law' as related to attention and arousal. The hypothesis stated that as arousal increases so the attentional field decreases. Subsequently if an individual becomes over aroused then their attentional field can narrow to the point where they are missing task relevant information. At such a level, performance decreases. This theory contradicts many of the distraction theories of attention and performance. Such theories have suggested that anxiety is associated with reduced concentration and increased distractibility (Eysenck, 1982).

Wine (1980) proposed that arousal and anxiety influence attentional focus due to a limited capacity attention resource. Wine (1980) suggests that when an individual experiences anxiety, it uses up some of their capacity for attention thus less attention can be devoted to performance. Eysenck (1979) studied the effects of anxiety on cognitive task performance, based on two major tenets. Firstly that anxiety disrupts the functioning of the working memory and secondly that individuals high in trait anxiety attempt to compensate for the adverse effects of anxiety through investment of processing resources. Individuals high in trait anxiety will therefore have less spare processing capacity than those individuals low in trait anxiety.

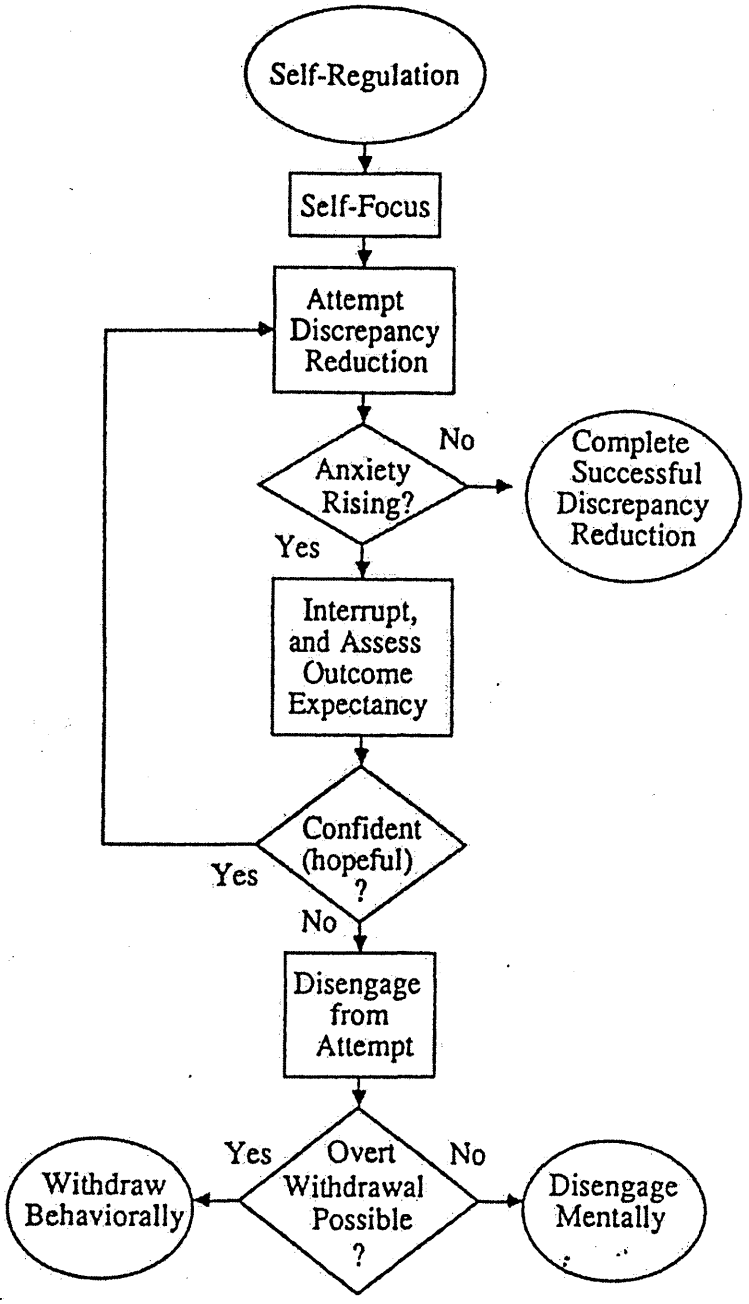
Boutcher (1992) has proposed an integrated model of attention and sports performance. This model combines a number of theoretical positions and includes changes in an individual's arousal level. The model predicts that enduring dispositions such as trait anxiety, the demands of the activity and environmental factors determine the level of physiological arousal that an individual experiences. An important aspect of this model is that it integrates arousal levels with controlled

and automatic processing. The idea of consciously controlling movement is a factor associated with the choking process (Baumeister, 1984). The model suggests that the balance that exists between controlled and automatic processing dictates optimal attentional states. The model also provides psychophysical variables, which are proposed as being factors that can assess attention during performance. Little research has been conducted to test this model. However, due to the interactive nature of its components it is appealing to the sport psychologist interested in the role of attention and arousal on performance.

Carver and Scheier (1988) developed a control process perspective on attention and anxiety (see Figure 2.2). Their theory suggests that renewed effort and disengagement of skilled performance is exaggerated by self-focused attention. The major aspect of this theory is the individual's expectancy (favourable versus unfavourable) of being able to cope with the anxiety being experienced, and being able to successfully finish the action that is to be attempted. The authors propose that an individual who has serious doubts about their ability to complete the task is likely to disengage. Similar findings were established by Carver and Scheier (1978) who concluded that the most common intrusive negative thought in test-anxious individuals was the desire to escape. If the individual returns to the situation in which the anxiety was initially experienced, then the individual becomes aware of the anxiety again, and re-confronts the factors that had prompted the initial disengagement. Carver and Scheier (1988) proposed that having a focus on the self can influence both task engagement and dysfunctional responses to anxiety. Thus self-focus was not perceived purely as a negative factor (Carver & Scheier, 1988). Facilitation or dysfunction depends not on whether the person was self-focused, but more on the processes that are taking place within the person. If an individual anticipates successfully achieving their goal then, regardless of whether they are anxious or self-focused, they will remain task engaged. The self-focus of an individual whose performance was deteriorating due to increased anxiety will be aimed at a different aspect of self. The focus of this individual will be on the perceived deficits of self, self-doubts and the implications of not achieving the desired goal. Such a process leads to disengagement from the task. The consequences of disengaging

Figure 2.2 - A Control Process Perspective on Anxiety and Attention

(Carver & Scheier, 1988)



result in decreased effort, physical withdraw or psychological disengagement and, ultimately, in the impairment of behaviour. It is suggested that the more self-focused the individual is, the more exaggerated the consequences become either facilitating or debilitating performance. Such a model has important implications for sports performance phenomena such as the 'yips' and performance phobias. The appealing aspects of such a model for researchers investigating the 'yips' are that it includes the factors of disengagement and behavioural impairment. Both of these factors are characteristic of the 'yips' experience, with individuals experiencing major disruptions throughout their stroke execution and subsequently not wanting to continue participating in the sport.

A further psychological phenomenon that includes a number of interacting factors that have been previously discussed in this review of literature is that of choking. This phenomenon has received considerable attention in the academic literature.

2.6. CHOKING AND PERFORMANCE

Choking under pressure has been defined by Baumeister (1984) as

> "a metaphorical expression used to describe the occurrence of inferior performance despite an individual striving and situational demands for superior performance". (p.610).

Two attentional hypotheses have been proposed to explain choking, the first of these is distraction (Wine, 1971) and the second is self-focus (Baumeister, 1984). The distraction models propose that choking occurs due to interference with attentional resources. When an individual experiences pressure their attention becomes focussed on task irrelevant cues and therefore they fail to allocate appropriate attentional resources to the task. Where choking occurs in the absence of external distractions, theorists explain this due to the presence of internal distracters (Doctor & Altman, 1969; Eysenck, 1979; Kahneman, 1973; Morris & Liebert, 1969; Wine, 1971). Typical internal distracters would be task irrelevant thoughts. Distraction theorists

cite worry as a cause for an attentional shift from task relevant to task-irrelevant information. A theoretical explanation for this attentional shift is processing efficiency theory (Eysenck & Calvo, 1992). This theory postulates that state anxiety produces worry which can have two consequences on performance. Firstly, worry can produce an increase in on-task effort, this increase in effort is at the expense of processing efficiency. The second consequence is that worry reduces the capacity of the working memory, this decreases the resources that would be available to deal with concurrent tasks. Mullen and Hardy (2000) have found partial support for processing efficiency being responsible for performance breakdown in golf putting due to an increase in effort.

An alternative model of choking which included self-awareness was proposed by Baumeister (1984). This model suggested that pressure increases self-consciousness and that this focus of attention disrupts the skilful performance. Baumeister (1984) stated that attempting to consciously control automatic skills was problematic as consciousness no longer held the knowledge of these skills. Such a focus of attention subsequently has a detrimental effect on skill acquisition. This perspective of conscious control supports the work of Langer and Imber (1979). Baumeister (1984) stated:

> "Under pressure, a person realises consciously that it is important to execute the behaviour correctly. Consciousness attempts to ensure the correctness of this execution by monitoring the process of performance; but consciousness does not contain the knowledge of these skills, so that it ironically reduces the reliability and success of the performance when it attempts to control it." (p.610-611).

To test the choking model Baumeister (1984) carried out a number of experiments using a co-ordination skilled task first utilised by Martens and Landers (1972). The task required the participants to have high levels of both motor and visual motor co-

ordination. Baumeister (1984) aimed to compare increased awareness of movement with dispositional self-consciousness and the manipulation of pressure.
The first stage of the experiment was conducted in order to establish whether awareness of movement was in fact detrimental to performance. The participants were required to perform a co-ordination task in which they had to control a ball by moving two rods horizontally. The object of the task was to roll the ball as far as possible from the starting point whilst controlling the rods with their hands. One experimental group were required to be aware of their hands whilst performing and the other were required to focus their attention on the ball. The results demonstrated that those in the hands condition performed significantly worse than those who focused on the ball. Baumeister (1984) concluded that directing attention to the movements of the individual disrupted performance. Such findings agree with those of Deikman, (1969), Kimble and Perlmuter (1970), Klatzky (1984), Langer (1978) and Langer and Imber (1979) who also concluded that heightened self-awareness to oneself can disrupt performance. The mechanisms of Baumeister's (1984) choking model support recent research into the conscious processing of automatic skills (Hardy et al., 1996b; Masters, 1992).

Based on these initial findings Baumeister (1984) hypothesised that individuals who are low in dispositional self-consciousness should be especially vulnerable to choking. Low self-conscious individuals are habitually unaware of their internal states and processes and therefore are not used to performing with an internal focus. Participants were divided into high and low self-consciousness as determined by the self-consciousness scale (Fenigstein et al., 1975). Analysis was carried out using the private and public self-consciousness subscales. It was concluded that individuals low in public self-consciousness showed the greatest vulnerability when instructed to be aware of their performance.

Further studies by Baumeister (1984) investigated the effects of pressure on performance in high and low self-conscious individuals. Pressure was manipulated through the use of a confederate who performed the task either slightly better or slightly worse than the participant. It was predicted that in the condition where the

confederate performed slightly better than the participant choking would be more common. The source of the pressure relied on self-presentational concerns on behalf of the participant. In accordance with the model of choking provided by Baumeister (1984), it was suggested that when individuals experience pressure then they pay greater conscious attention to their performance. It was suggested that such a focus of attention would be detrimental to performance. It was further proposed that individuals who were low in dispositional self-consciousness would be more likely to experience choking under pressure. This was because low self-conscious individuals are not used to performing whilst feeling self-conscious. The results of this study indicated that participants who were low in self-consciousness performed significantly worse than those high in self-consciousness. Such findings led Baumeister (1984) to conclude that self-consciousness, as determined by the self-consciousness scale, was closely related to choking.

A number of criticisms can be made of the Baumeister (1984) studies. Firstly his conclusion that individuals low in self-consciousness were more likely to choke under pressure could be questioned. For example the nature of highly self-conscious individuals could suggest they were simply more motivated to perform well throughout the experiment, due to their more natural self-presentational concerns. Hence, it could be that individuals high in self-consciousness were more motivated in the pressure condition due to self-presentational concerns.

Secondly, Baumeister (1984) did not measure pressure in any way. The fact that the experimental group's scores went down in the high pressure condition is the only indication that this was due to increased stress and not other factors such as boredom or de-motivation. Using a state-based anxiety measure would have controlled for this.

A further finding from this study was that when performing under pressure highly self-conscious participants improved their performance while those low in public self-consciousness deteriorated. This led Baumeister (1984) to conclude:

> ".....that situational increases in self-consciousness disrupt performance less among individuals who are habitually self-conscious than those who are not." (p.615)

In a further experiment, Baumeister (1984) created pressure using a cash incentive. Hence, the pressure was explicit, rather than implicit in nature. In the high pressure condition participants were required to try and gain a score that was within the participant's reach, yet would require a good performance in order to achieve their target. Each participant's pressure condition target score was determined from an initial pre-test trial. The results of this experiment suggested that low self-conscious individuals demonstrated a greater tendency to choke in the pressure condition than those high in self-consciousness. It is important to note that both high and low self-conscious participants performance decreased in the high pressure condition, yet only the low self-conscious participants scores decreased significantly. Both high and low self-conscious individuals therefore demonstrated a trend to choke under pressure.

Baumeister (1984) attempted to provide evidence for choking in a field-setting on a well-learned task. The task chosen was a popular arcade game. Participants were asked to score as highly as they could whilst being watched by an experimenter. This condition was considered the pressure condition, with the pressure produced through self-presentational concerns. The results demonstrated that there was on average a 25% decrease in performance in the pressure condition. It was concluded that situational pressure clearly resulted in choking. Within this experiment self-consciousness was not measured. A different interpretation of Baumeister's (1984) conclusions could be extrapolated. For example, the participants who were high in self-consciousness could have been more highly motivated to make a favourable impression in front of relevant others, and thus would have performed better simply because they did not want to be evaluated negatively.

A second limitation of Baumeister's (1984) conclusions was that the motor co-ordination task used may not have been considered threatening to the participants, as ego-involvement related to the task may have been minimal. Therefore, the

detrimental effects of being highly self-focused may not have been evident during this task. There are a number of further weaknesses to the Baumeister (1984) study that need to be highlighted. The task used was a novel one and the number of practice trials was insufficient to develop the skill to an automatic level of functioning. The fact that participants demonstrating low dispositional self-consciousness performed worse on the task may be because that they donated insufficient attention to the movements required in the task during learning and practice, due to less ego-involvement. Finally, the arcade game was not a good example of a well-learned task. In such games the way the play develops is randomised and therefore performance decrements could simply be due to more difficult game plays being experienced in the pressure condition.

Despite the limitations provided, many insights into the choking process have been established from the work of Baumeister (1984). The mechanisms that underpin the model of choking appear to be highly relevant. The components of self-consciousness, self-awareness and conscious control of movement are all factors that need to be studied further in a sport environment.

The conclusions that low self-conscious individuals are more likely to choke under pressure needs to be treated with some skepticism. In order to establish the role of self-consciousness in the choking process, tasks need to be used that are automatic in nature and also have an element of ego-involvement for the participants. This factor would control for motivational issues.

Lewis and Linder (1997) investigated the sources of choking in golf-putting. The two mechanisms that were tested were distraction (Wine, 1971), where pressure distracts attention away from the task, and self-focus, where attention is directed towards the self (Baumeister, 1984). In the distraction condition golfers were required to count backwards from one hundred throughout the testing and the self-awareness manipulation was induced by introducing a video camera. The participants were also informed that the video tape would be analysed by sport psychologists, the golf team and coaches. Pressure was manipulated by offering performance contingent rewards.

The results of the experiment provided support for self-focused attention being the source of choking. Thus, the findings from this study support the self-focus models of attention which involve performers focusing their conscious attention on the process of performance (Langer & Imber, 1979).

A further contributing factor to the choking process is that of self-presentational concerns (Baumeister, 1982; Leary, 1992). Leary (1992) states that two clear processes underlie choking. The first of these is when an individual devotes excessive attention to the process of performance (Baumeister, 1984). The second process is when individuals become nervous and that tension interferes with the execution of the skill. Leary (1992) states that anything that increases the importance of an individual's performance can trigger both of the processes that underlie choking. One major factor that increases the importance of performance is that of concerns with others perceptions and evaluations. Leary (1992) proposed that when an individual's motivation to impress others increases they are more likely to pay conscious attention to their behaviour. Leary (1992) stated that it is this focus of attention that increases anxiety, which subsequently could interfere with physical movements.

James and Collins (1997) attempted to establish the self-presentational sources of competitive stress. They identified seven major contributing factors that were sources of stress in athletes. These factors were: significant other stressors, social evaluation, competitive anxiety and doubts, perceived readiness issues, the nature of competition, environmental demands and not performing to the required standard. Two thirds of the sources of stress highlighted in this study appeared to heighten the athlete's need to present themselves in a favourable way to the audience. The authors concluded that the athletes were sensitive about the impressions that people formed of them whilst they were performing. James and Collins (1997) also highlighted that stress responses could be triggered by factors that primarily influence the self-presentational implications of performance.

To research choking effects on skilled performance, researchers have had to use a number of pressure manipulations to create the desired environment. Such

manipulations include: competition, reward contingency, punishment contingency, ego-relevance and the presence of an audience (Baumeister & Showers, 1986). Each of these factors have been put forward as possible contributing factors to the choking process. Sanders, Baron and Moore (1978) suggested that choking could be caused by implicit competition. This was demonstrated when individuals were required to perform a complex copying task where participants compared their performance with each other. The authors were unable to determine whether their findings were the result of choking or simply that individuals were distracted by the fact that they were watching a co-actor. Baumeister (1984) also found that implicit competition between sexes created choking effects on a skilful co-ordination task. In this experiment male participants who were paired with a female confederate tended to choke when the confederate consistently performed slightly better than them.

Contingent rewards have been shown to promote pressure and subsequently decrease performance. Baumeister (1984) found that individuals who were offered cash incentives performed worse than participants who were offered no money. Similar results were found by McNamara and Fisch (1964) in an attentional task and for the effects on learning in children by Miller and Estes (1961) and McGraw and McCullers (1974). The threat of punishment has been shown to decrease performance across a number of tasks. Such punishments can be physical such as electric shock treatment (Deese, Lazarus & Keenan, 1953) or psychological such as possible elimination from a tournament (Baumeister & Steinhilber, 1984). Ego relevance has also been shown to lead to choking effects. The majority of research within this area has been carried out using cognitive tasks. However, if an athlete competes at a particular sport then they are likely to have a positive image of themselves performing their sport and will therefore be ego-involved. It has been proposed that the more ego involved an individual is, the more self-focused they are likely to be (Baumeister & Showers, 1986).

The influence of an audience on performance (social facilitation) has been used as a major tool in the choking research. Many studies have looked at the type of audience that causes increased pressure and, subsequently, choking. Seta and Seta (1993)

proposed that the importance of performing well is a function of three factors. These factors included the number of people in the audience, the salience of the audience and the status of the observer(s) in contrast to that of the performer. Paulus, Shannon, Wilson and Boone (1972) demonstrated decrements in highly skilled gymnasts' performances when they were told that an audience would be watching them ten minutes before they were due to perform. Similar findings were not established for gymnasts at a lower skill level.

Theoretical explanations for the effects of social facilitation have been originally based on the work of Zajonc (1965). Zajonc (1965) proposed that the mere presence of an audience could cause decrements in performance. This 'mere presence' theory was extended by Cottrell, Wack, Sekerak and Rittle (1968) who proposed that it was the evaluative nature of the audience that caused the decrements in performance. Other theories have emphasised characteristics such as self-awareness (Carver & Scheier, 1981; Duval & Wicklund, 1972), self presentation (Bond, 1982) and social monitoring (Guerin & Innes, 1982) as being the primary causes of social facilitation effects.

Baumeister and Showers (1986) proposed three kinds of mediators, of paradoxical pressure effects. These effects were task complexity, expectancies of success and failure and individual differences in susceptibility pressure.

Some tasks may be more prone to the influence of pressure than others. Much of the research has suggested that more complex tasks are more prone to choking effects (Weiner, 1966). Such findings are contradictory to those of Silva (1994) who found that a major source of pressure for individuals suffering from sport performance phobias was the simplistic nature of the skill that they are unable to perform. Bond and Titus (1983) have provided some evidence to suggest that simple tasks can break down under extreme pressure. The tasks that have been cited as being particularly prone to the 'yips' are all closed skills such as the golf putt, bowling in cricket, throwing a dart or striking a snooker ball. All of these skills should be perceived as

being relatively simple for an elite performer, yet for the novice these skills would still be considered to be complex.

The way in which an individual deals with pressure could be dictated by their expectancy of success or failure at performing the task. Such a perspective has been termed 'efficacy expectancies' (Bandura, 1977). The effects of negative expectations on performance have been studied by a number of authors (Green & Gange, 1977; Weiss & Miller, 1971). Such negative expectations have been linked to 'learned helplessness' (Carver, Blaney & Scheier, 1979). When an individual experiences learned helplessness, they withdraw physical effort from a task or skill that they are performing as they no longer believe that they can complete the task successfully. An alternative explanation is that positive expectancies counteract the effects of pressure and that negative expectancies are simply magnified by the presence of pressure. Studies by Bond (1982) and Green (1980) have shown that individuals who have recently experienced positive performances are less likely to choke under the observation of an audience than those who have had recent negative experiences. The expectations of an audience on an individual can also influence efficacy expectations. If an individual knows that there are certain expectations on them from an audience then the pressure that they perceive can be very severe (Schlenker & Leary, 1982). Baumeister, Hamilton and Tice (1985) showed that success expectancies from the individual typically improve performance, whereas an audience's expectancy of success produces negative effects. This research also provided further support for individuals who are low in self-consciousness performing worse than those high in self-consciousness.

A number of personality traits and individual differences have also been shown to predict choking effects. One such factor is anxiety. Individuals who are particularly anxious in test situations appear to be particularly vulnerable to pressure (Eysenck, 1979). A further factor is dispositional self-consciousness. Baumeister (1984) has proposed that individuals low in self-consciousness are more likely to experience choking effects. Baumeister and Showers (1986) stated :

"Future research is needed to corroborate the greater tendency of low (rather than high) self-consciousness persons to choke." (p.374).

The third individual factor to consider is skill. Contradictory research findings have been established regarding whether high or low skilled performers are more likely to choke (Paulus et al., 1972). A further complication when considering skill level is the individual's perceived skill level. Trope (1982) found that individuals who were uncertain about their skill level were more motivated to perform well than those who are aware of their level of skill. A further individual difference that could help to predict choking effects in future research is self-esteem. Baumeister and Showers (1986) suggest that self-esteem could help to explain the relationship between self-confidence and performance under pressure.

Crews (2001) studied the situational and dispositonal factors that were evident in skill failure when putting under pressure. Golfers were required to make five-foot straight putts on a flat green in three different experimental conditions. In the first condition golfers were instructed to make twenty putts, in stage two the golfers were asked to repeat the task but were told that their performance was being filmed by a national television company and was going to be broadcast live. In the final condition the golfers were offered a large monetary incentive if they could improve their previous score, they were also told that they would lose money if they did not. Throughout the testing an electroencephalographic (EEG) machine recorded brain activity. The findings from the experiment were that golfers who choke under pressure predominantly use the left hand side of their brain, whereas the successful golfers had equal amounts of increased activity, yet the activity was spread evenly throughout both sides of the brain. The findings of Crews (2001) provide theoretical support for the self-focus models of choking (Langer & Imber, 1979) and the conscious processing hypothesis (Masters, 1992). These models suggest that conscious processing of automatic skills results in their breakdown and ultimately in choking. The findings of Crews (2001) demonstrate that golfers who experience choking are predominantly using the conscious analytical side of their brain. Thus, these findings

provide valuable insights to sport psychologists working with sports performers. Crews (2001) suggests that in order to cope with pressure, players need to be able to access the more creative right side of the brain throughout performance. A mental skill such as imagery is a technique which enables performers to access the right side of the brain. These findings support those of McMaster (1993) and Pates and Maynard (2000) who have found that using hypnosis improves golfing performance. Hypnosis consists of deep relaxation combined with visualisation, therefore it stimulates the right side of the brain. Clearly future research needs to investigate psychological techniques that can access the right side of the brain and establish whether these techniques can prevent choking and rehabilitate those that suffer from the 'yips'.

The research conducted on choking and performance decrements under pressure has provided some interesting theoretical explanations. It appears that at present the best explanations for choking under pressure appear to be linked to attentional models. Attentional models of choking are based around the principle that self-awareness causes performance decrements through distraction (Wine, 1971) or self-focus and attempts to consciously control skilled performance (Baumeister, 1984). These findings provide some insight into the experience of the 'yips' in golf as described by McDaniel et al. (1989). However, the specific nature of the 'yips' and whether it represents a focal dystonia, as proposed by McDaniel et al. (1989), or is an extreme form of choking, as suggested by Masters (1992), needs further enquiry. A phenomenon similar to the 'yips' that has been researched in the sport psychology literature is the sport performance phobia. This performance problem appears to have many characteristics that could be associated with those outlined by McDaniel et al. (1989).

2.7. SPORT PERFORMANCE PHOBIAS

Silva (1994) investigated a phenomenon similar to the 'yips' from a purely psychological perspective. Owing to symptoms of intense anxiety and avoidance behaviour, Silva (1994) called the problem a sports performance phobia. His rationale

for describing this problem as a phobia was based on the definition of a phobic response, "A phobia is a persistent, excessive, unreasonable fear of a specific object, activity or situation that results in a compelling desire to avoid the dreaded object, activity or situation" (p.101).

Silva (1994) made connections between sports performance phobias and performance phobias observed in other areas of human endeavour such as musical performance and acting on stage. Sports performance phobia develop when an individual finds that they are unable to perform a skill that they could perform with ease, prior to the onset of the phobia. Silva (1994) described the sports phobia as an irrational fear relating to a specific performance parameter which the performer was fully capable of executing prior to the phobic response. Silva (1994) highlighted similarities between the sports performance problem and clinical phobias. The common characteristics were an excessive and unreasonable concern about performing a routine task, a desire to avoid the activity, high anxiety resulting in panic and ultimately behaviour being compromised or disabled (Goodwin, 1983).

Silva (1994) suggested that sports performance phobias have similarities to many other kinds of phobia such as simple, social and agoraphobic syndromes. The strong similarities were that when faced with the phobic situation the individual experiences a loss of control and becomes disorientated. The differences that exist between the sports performance phobia and clinical phobias were that, before the onset, the performer experiences no concern or performance anxiety concerning the performance skill; it is also often isolated to a specific element of the total performance. The skill that is affected is usually an essential yet simple aspect of the overall performance. The fact that the skill is simple is responsible for the immense sense of threat experienced by the individual. Other significant factors experienced by individuals were guilt, intense personal embarrassment, intense anticipation anxiety and a significant decrease in self-confidence. The need to escape from the situation by leaving the field of play or intentionally missing competition through faking illness were also characteristic of the performer's behaviour following the onset of the response. The phobia resulted in a disability to perform a very specific skill, yet did

not have an effect upon other sports performance, social interactions with individuals or academic performance.

Responses from others with regard to the individuals affected ranged from anger, avoidance and sincere empathy. All of the individuals who have been affected by such a performance phobia have been within the age range of 17-24 and have been without gender bias. This age range is a controversial issue as the research provided by McDaniel et al. (1989) found that the 'yips' in golf is more likely in older players, who have accumulated more years of playing experience.

Two case-studies were provided by Silva (1994) to demonstrate the sports performance phobia. The first was of a 20 year old female tennis player who developed a phobic response about 'coming to the net'. Following the initial experience the player felt as if she had no control over her racket when approaching the net and experienced extreme fear. A cognitive behavioural intervention was implemented and delivered in three phases: identification, cognitive restructuring and covert conditioning. The intervention was performed over seven weeks and resulted in a dramatic improvement in her play at the net and also her belief in herself as a player.

The second study illustrated the case of a 17 year old male baseball player. This participant developed a phobic response about throwing the ball back to the pitcher after receiving a pitched ball. The players reported having a strange feeling when he released the ball and a perception of having no control over where the ball was going.

The same cognitive behavioural intervention was used as outlined in the previous case study. At the identification phase of the intervention the participant reported that he was controlled by fear and he wanted to avoid catching at all costs because catching meant he had to throw the ball back to the pitcher. He felt that people were making fun of him and that he was now a joke among his team mates and the opposition. The focus of the cognitive restructuring phase was designed to bring the athlete's attention to the simplicity of the action in relation to other throwing tasks that he could

perform. Covert conditioning involved behavioural modeling and behavioural modeling with coping. This stage required the individual to learn a relaxation technique and also develop imagery skills. Following the intervention, errant throws decreased from 40/50 down to single figures. Despite this dramatic increase in performance and positive approach, the individual was still concerned that this problem could creep back into his game.

Silva (1994) suggests that sports performance phobias usually effect simple skills. This leads to the high avoidance and fear factor. The reduction of anxiety has been cited as a highly significant factor in the intervention programme provided. Silva (1994) stated :

> "Sport performance phobias are certainly powerful obstacles confronting athletes in various team and individual sports....as sport psychologists become more aware of the phobic responses to sport performance other intervention approaches may also demonstrate efficacy in the enhancement of athlete performance and the maintenance of well being in the athlete" (p.115).

The findings reported by Silva (1994) are contradictory to those of McDaniel et al. (1989) and Sachdev (1992). Silva (1994) suggests the sports performance phobia is clearly an anxiety-based disorder. However, the origins of the sports phobia were not highlighted within this research study. Therefore, it could not be established whether the anxiety symptoms were the result of an initial physical disorder. The intervention strategies proposed by Silva (1994) to help sport performance phobias also need to be considered when dealing with individuals who show characteristics of the 'yips'.

Stidwill (1994) looked at the application of self-efficacy theory in the treatment of sport performance phobias. Self-efficacy theory has been used to look at specific phobic problems and avoidance behaviour in previous research (Maddux, 1991). Stidwill (1994) suggests that this theory may also have a role to play in the understanding of sport performance phobias. Stidwill (1994) stated that the best way

to predict if an individual will overcome a particular fear is to measure their self-efficacy expectancy in overcoming that specific fear, not to assess the individual's general sense of self-esteem. Stidwill (1994) suggests that sports performance phobias are similar to simple phobias. The definition of a simple phobia being "a persistent fear of a circumscribed stimulus object or situation" (p.199).

Stidwill (1994) cites the case of Steve Sax as being typical of a sports performance phobia. In this situation the player developed a phobic response about routine throws in baseball, this resulted in the performance problem being labelled Steve Sax disease. This problem is very similar to that cited by Silva (1994) who also described the performance problem of a baseball player who developed a phobia related to throwing. Stidwill (1994) suggests that such a problem is not limited to elite athletes, as it can affect athletes of all abilities. The case study used to test the self-efficacy intervention was applied to a 21year old female college student. At the age of 12 she had been hit in the head with a bat and since that day had avoided playing baseball. The intervention delivered was based on Bandura's (1977) four primary modes of influence: vicarious experience, verbal persuasion, successful accomplishments and emotional or physiological arousal. Following the introduction of an intervention based on these modes, the subject experienced a decrease in physiological arousal and reduced anxiety, resulting in decreased symptoms of the phobia.

Despite this research by Stidwill (1994) being titled sports performance phobias, and the citation of references and parallels drawn to the work of Silva (1994), it appears that these authors were investigating two essentially different problems. Silva (1994) was looking at a specific movement problem that occurs after an individual experiences the loss of ability to carry out the skill. This apparent loss of ability results in the fear and avoidance behaviour that is described as a performance phobia. This problem has similar characteristics to the 'yips' as defined by McDaniel et al. (1989). Stidwill (1994) was not looking specifically at the apparent loss of a routine skill, he was investigating a phobia that had developed due to a specific fear of a past situation. In this case-study the onset of the response was caused by the participant having a bad experience whilst playing. In the case of Silva (1994) an explanation for

why the performance problem developed was not provided and was not known. This observation may have important implications for the structure of interventions used to reduce the problem. It appears that the problem lies in definition. The word 'phobia' has been used by Silva (1994) to describe this performance phenomena based on the symptoms experienced by individuals following onset. These symptoms reflect closely those provided by Stidwill (1994) where the athlete reported anxiety, accelerated heart rate, sweaty palms, dizziness, nausea and severe avoidance. The other similarity is the specificity of the problem. As Silva (1994) stated, sport performance phobias relate to a specific performance parameter. In the case-study provided by Stidwill (1994), the individual's phobia was highly specific and directed only to catching a ball being hit from a bat, not to a ball being thrown to her or batting a ball herself. Thus, there are areas where these two studies overlap in terms of their symptoms. When taking into account the definition of a phobic reaction it is clear to see why Silva (1994) had used this term.

Farkas (1989) performed an intervention strategy on a phobic triathlete. In this case study the individual had a fear of swimming in the ocean despite her known ability to swim in other conditions. The athlete complained of an intense fear and avoidance of swimming in the ocean through fear of drowning. The fear was considered irrational because the swimmer was very capable of swimming the race distance in a different environment. Through an in vivo exposure intervention the swimmer swam in the ocean and reduced her swim time by more than half. Again this investigation shows similarities to the sports performance phobia (Silva, 1994) in terms of the symptoms experienced, yet is very different in that the individual did not undergo an inexplicable breakdown of the skill. It was a fear of an environment which the participant had not experienced that led to the phobic reaction. Thus, the use of the term 'performance phobia' as proposed by Silva (1994), could lead to confusion when investigating performance problems associated with the 'yips'.

Woody (1996) has proposed that self-focused attention has a link to social anxiety and social phobia. Many investigators have suggested that an excessive form of self-focused attention could play a role in performance anxiety (Hope et al., 1989;

Hartman, 1983; Sarason, 1975; Schlenker & Leary, 1982). Individuals who experience social anxiety can become preoccupied with negative self-directed cognitive activity. This could be caused by changing the attributional bias of socially anxious individuals. Socially anxious people tend to make self-attributions for social failure and this could be a function of self-attention. Such a self-focus encourages individuals to be more self-critical and aware of every social flaw that they make during an interaction. This in turn results in an individual continuously monitoring their performance in order to establish whether they are favourably influencing others' perceptions. Woody (1996) stated that excessive self-focus creates an increase in negative self-statements by creating internal attributions for skill failure, this subsequently leads to increases in self-scrutiny and self-consciousness.

Social phobics usually experience performance decrements when in social situations. It is proposed that anxiety itself interferes with otherwise adequate interpersonal skills. This anxiety then leads to excessive self-focus which results in an inappropriate internal attentional focus. Such an inappropriate focus diverts attention away from task-relevant information such as listening. Poor social performance then results in negative feedback (Curtis & Miller, 1986), which in turn increases levels of anxiety and perceived competence. The increase in anxiety intensifies the self-focus and the individual then finds themselves in a negative cycle.

Such a model of social phobia shows clear similarities to the experiences of those with sports performance phobias as described by Silva (1994). The mechanisms that underpin the development of such a social phobia also share many similarities with the experience of the 'yips' in sport. The interacting components of anxiety and attention result in an internal focus that appears to be characteristic of individuals suffering from the 'yips' in golf (McDaniel et al., 1989) and also sports performance phobia (Silva, 1994). The long-term effects of social phobia and subsequent desire to avoid the feared stimulus appear to show highly similar characteristics to the 'yips' in sport. The processes that underpin social phobia and the subsequent behavioural effects need to be fully explored in order to establish the relationship between phobia and the 'yips' in sport.

2.8. THE 'YIPS'

The motor skill phenomenon the 'yips' is a problem experienced by many golfers, cricketers, darts and snooker players (McDaniel et al. 1989; Moody, 1993; Sachdev, 1992; Smith et al., 2000; White, 1993). The problem results in performers being unable to perform a routine motor skill that prior to the onset of the 'yips' was a relatively simple task. This phenomenon has resulted in many sporting careers being cut prematurely short. The most documented cases of this phenomenon have been Bernhard Langer in golf, Eric Bristow in darts and Keith Medleycott in cricket. All these individuals have experienced a breakdown in their ability to perform and have had radically to alter their technique in order to continue in their sport. Despite much anecdotal evidence having been recorded about the problem (Moody, 1993; White, 1993), little research has been conducted by the academic community. The theoretical debate about the central causes of the 'yips' centres on stress and dystonia. McDaniel et al. (1989) and Sachdev (1992) both concluded that the 'yips' were a focal dystonia. Theoretical explanations for how focal dystonias might contribute to the 'yips' experience include the disruption of efferent output from the striatum through the thalmus to the precentral motor cortex and the existence of dystonia in the catecholamine transmitters in the brain stem and diencephalon (McDaniel et al., 1989). Both the McDaniel et al., (1989) and Sachdev (1992) studies recognise that stress is a factor that makes the disorder worse and could have a role to play in the manifestation of the 'yips' in some golfers, but was not considered to be the initial cause. Smith et al. (2000) have taken a different theoretical perspective. These researchers concluded that the 'yips' could be an interaction of psychoneuromuscular influences, in which dystonia and anxiety anchor the extremes of a continuum. The most common focal dystonia in everyday life is writer's cramp and research has been developed which suggests that this disorder is not related to anxiety (Harrington, Wieck, Marks & Marsden, 1988). Thus, if the 'yips' is a focal dystonia caused by over use then it is unlikely that anxiety is the initial cause.

Reference to the 'yips' has been made in the philosophical literature on sports performance. Wertz (1986) researched the 'yips' from a philosophical perspective in

which he discussed whether the 'yips', when putting, were an action or whether they were involuntary. Wertz (1986) cites Don January's (a professional golfer) descriptive remarks of the 'yips' as being a strong argument for this phenomenon being something unwillful and involuntary.

> "It's like being trapped inside a burning house and not being able to get out.....then suddenly it happens, your palms get slick and the putter develops a mind of its own....you jabb the putt.....welcome to the club ...a case of the 'yips', golf's gift to the human nervous system." (p. 97)

From this description of the 'yips' it would appear that the action is purely involuntary. Wertz (1986) questions whether the 'yips' are simply the same as acting nervously. Following a series of qualitative studies with individuals who have suffered from the 'yips', a hierarchy of experiences was developed by Wertz (1986): choking (the yips), whiskey wrists (your grip feels wrong and shots feel jerky), tentative play and tight or loose play. One of the main contributions to the 'yips' phenomena as suggested by Wertz (1986) was that an individual's belief in their circumstances gets in the way of successfully performing the skill.

The notion of automaticity in the execution of a skill was also considered to be a potential contributor to the 'yips'. Wertz (1986) suggested that the apparent breakdown in automaticity was because the body performs actions without the mind being aware of the movements more than superficially. Therefore, as sport actions are a mixture of conscious and unconscious control, the 'yips' could occur when these two components were out of phase.

McDaniel et al. (1989) approached the problem of the 'yips' in golf putting from a neurological perspective. They defined the 'yips' as, "a motor phenomenon that affects golfers and consists of involuntary movements occurring in the course of the execution of finely controlled, skilled motor behaviour" (p.192). Their research proposed that this motor-skill problem represents a focal dystonia similar to

occupational dystonias or cramps (Sheehy & Marsden, 1982). These include writers, typists, violinists, pianists, telegraphers, snooker players, dart throwers and craftsmen (Newmark & Hochberg, 1987). The paper provided a case study of a thirty-five year old male professional golfer. The patient described an involuntary "jerk" and "pulling" sensation of his right hand and wrist while putting. The participant claimed to develop the 'yips' at the age of twenty three, it only occurred during tournament play and was made worse by anxiety. The player's compensatory strategies for overcoming this problem included taking propranolol, altering his hand grip and visual fixation. However, all these methods proved to be ineffective in alleviating the problem. The player learnt how to putt left-handed and this proved to be a successful strategy, despite the presence of the 'yips' whenever he returned to putting right-handed.

McDaniel et al. (1989) constructed a 69 item questionnaire with the aid of a professional golfer who suffered from the 'yips'. The questionnaire included a number of sections including demographic and physical characteristics, medical history, psychiatric symptoms, medication exposure and family histories. Those players who claimed to suffer from the 'yips' were required to answer a further section of questions regarding phenomenology, location, duration, severity, treatment, and motor concomitants of the disorder.

From a subject sample of 360 golfers 28% claimed to suffer from the 'yips'. The players described the physical experience in a number of ways: jerks, tremors and spasms. The term "freezing" was also used by 61% of those who claimed to suffer. The presence of anxiety intensified the response and it had been experienced both in practice (46%) and competition (99%). A number of compensatory strategies were developed by the participants which were dominated by an actual technical change in the way they putted to overcome the problem. A number of other activities were cited as also being affected, these included playing billiards and playing a musical instrument.

A comparison of those who experienced the 'yips' and those who didn't produced two distinct differences; a demographic feature and a psychiatric characteristic. These differences were the number of years of golf played and obsessional thinking. The golfers who claimed to suffer from the 'yips' had a mean age of 35.6 years whereas those who were unaffected had a mean of 31.0 years. The obsessional thinking scale also provided a significant difference between the two participant groups. This scale was characterised by finding it hard to concentrate and having unwanted thoughts and images that would not go away.

The experimenters stressed that due to the nature of this questionnaire based research, the precise nature of the disorder could not be determined and that this was only a first step in understanding the problem. Their results suggested that three major factors discriminated between golfers with the disorder and those without. The authors established that golfers who experienced the 'yips' were older, had more years playing experience and were more prone to obsessional thinking.

The researchers concluded that the motor characteristics of the 'yips' are similar to those reported in other occupational dystonias. However, they state that no skill is immune to affliction from an occupational dystonia. They also suggested that the importance of performance anxiety needs further consideration despite there being no significant difference between the two groups in terms of the frequency or severity of anxiety related symptoms. Despite this, the research did support the notion that anxiety will increase the intensity of this movement disorder.

The link between obsessional thinking and the 'yips' in sports performance needs to be explored in greater detail. The authors make some interesting conclusions with regard to the pathophysiology of occupational dystonias and the possible links that this has with motor performance. Biochemical studies have failed to provide evidence for dystonic phenomena, however it is suggested that the onset of such phenomena could occur due to subcortical biochemical changes occurring in the course of normal ageing. They suggest that such a motor disturbance may become evident spontaneously or in the context of excessive use within the unusual co-ordination

demands of an occupational activity. McDaniel and his colleagues (1989) concluded that the 'yips' were a physical problem rather than a psychological one. However, it was proposed that anxiety intensified the disorder. In the summary established by McDaniel et al. (1989) the psychological factors of obsessional thinking and anxiety were highlighted as being important yet were not considered in their conclusions. Based on these initial findings it is extremely important to continue to investigate the influence of psychological factors in the experience of the 'yips' before it can be concluded that the disorder is purely physical. Because the authors believe that the problem was initially physical does not mean that it could not develop into a psychological disorder. The acknowledgement that anxiety intensifies the problem would suggest that this could be the case. A further factor that the McDaniel et al. (1989) research does not take into account are the consequences of the 'yips'. The paper attempted to establish possible causes of the 'yips' yet failed to acknowledge the long-term psychological consequences of experiencing a breakdown in an automatic skill. The influence of factors such as self-confidence and fear of failure also need to be considered when looking at how an initial situation specific routine skill can develop into a long-term movement disorder.

A number of further criticisms can be made of the McDaniel et al. (1989) study. For instance, from the total number of golfers who completed the questionnaire, 28% claimed to have suffered from the 'yips'. This percentage appears to be very high, therefore it could question how many of these golfers were simply describing the experience of an anxious putt. This is clearly very different from the 'yips' which results in long-term behavioural impairment. The authors acknowledge that psychological variables need to be considered, as the construct of obsessional thinking was a distinctive characteristic of those who claimed to suffer from the 'yips'. The fact that anxiety intensifies the disorder suggests that the role that anxiety played in the origins of the 'yips' also needed further enquiry. However, the potential role that anxiety plays in the development of the 'yips' was not discussed.

Further research has been carried out in the movement disorder literature to suggest that the involuntary movements in motor skill tasks are not an anxiety-related

disorder. Within this literature the 'yips' in sport can be related to spasms or cramps known to affect writers, musicians, typists and artists (Sheehy & Marsden, 1982). The initial causes for these 'spasms' have been heavily debated in the literature with some authors suggesting that it is primarily a psychological disorder (Bindman & Tibbetts, 1977; Crisp & Molodofsky, 1965; Culpin, 1931; Pai, 1947; Walton, 1985). Psychological explanations for the disorder have been related to anxiety, hysteria, neurasthenia, personality disorders, psychodynamic conflict, simple phobia and obsessionality. Conflicting evidence has been provided suggesting that the disorder is a focal task-specific dystonia (Critchley, 1977; Lishman, 1987; McDaniel et al., 1989; Rossenbaum & Jankovic, 1988; Sheehy, Rothwell & Marsden, 1988). The 'yips' have also been discussed in the medical literature (Foster, 1977; Lees, 1985).

Foster (1977) supported the view that the 'yips' were a physical movement disorder. Yet when Foster (1977) considered the potential causes of the yips a number of psychological phenomena were also highlighted :

> "Lack of attention, a false assessment of the line or a poorly timed, somewhat nervous, stroke may all be responsible. I would put to you, however, that there is a more sinister cause for the agony of over-frequent missing of short putts - a disease in golfing terms described as 'the jerks', 'the yips' or 'the twitch'" (p.27).

Foster (1977) highlighted the case study of Sam Snead a successful golfer in the 1940's. Snead developed an inability to hole out short putts. Subsequently Snead had to radically alter his technique, this resulted in the development of the 'side winding technique'. Foster (1977) commented on the humiliation of having to radically change his putting stroke so severely to combat the uncontrollable 'spasms':

> "One of the greatest players and one of the most beautiful swingers of a golf club ever seen has been reduced to crouching, feet together, facing the hole, with the putter held at the top with

> a reversed left hand grip and the right hand, index finger extended pushed down the extended grip....from this curious and awkward position he putts with the ball outside the line of his right foot with a fluent swing and no hint of the jerk or spasm which had eroded his previous conventional method." (p.27).

Foster (1977) believed that there was very little that could be done to help those individuals who are afflicted by the 'yips' and attributed the changing 'financial motivations' as being a potential cause of the problem.

Sachdev (1992) sought to establish the clinical characteristics of twenty golfers suffering from the 'yips' in golf. The objective of this study was to establish whether the 'yips' were a form of anxiety disorder or were physical in nature. The participants used in this study were twenty players that claimed to suffer from the 'yips' in golf and twenty matched control participants. In order for a participant to be included as a 'yips' sufferer they had to meet six criteria. The criteria set were that participants had to have had at least five years playing experience, had to have developed a spasm, jerk, tremor or freezing during stroke execution. They also had to have had no previous history of dystonia or Parkinson's disease, a normal neurological and musculoskeletal examination and a fluctuating course of the problem, with unexplained exacerbations and remissions. The twenty golfers who met the criteria were matched with twenty control golfers for age, sex and golfing experience.

All the participants in the study had to complete a number of self-report measures to establish their psychopathology. The measures included: the General Health Questionnaire (GHQ); Spielberger's Trait Anxiety Scale (STAI); Eysenck Personality Inventory (EPI); Leyton Obsessional Inventory (LOI); Zung Self-Rating Depression Scale; the Somatization, Anxiety and Phobic Anxiety subscales of Symptom Check List -90 (SCL); Bortner Type A Behaviour Scale; and Childhood Separation Anxiety Scale (SAS). The players were also required to rate themselves on an anxiousness scale. In addition to these measures a number of neuropsychological tests were performed in order to establish mental and motor speed and visuomotor coordination.

The participants who suffered from the 'yips' had a mean age of 54.5 years, initially experienced the problem at a mean age of 31.1 years and had experienced the problem for a mean period of 19.4 years. Seven of the participants had experienced the 'yips' putting right handed and four whilst putting left-handed. All of the twenty golfers reported experiencing the 'yips' whilst putting, 15% experienced the 'yips' whilst playing short chips. The majority of the golfers experienced movement problems when they were within 6-8 ft from the hole. Within this distance the smoothness of the stroke was affected by one of three factors. The first was a sudden uncontrollable jerk, which occurred in the forearm and hands (in 75% of participants). The second problem was a spasm of the hand and forearm muscles (in 15% of participants). The third problem was that the swing froze and thus became jerky (in 55% of participants). In addition six of the participants reported problems in fixation of the eyes on the ball during putting. These individuals also claimed to have problems using visualisation previous to putting, a psychological skill that they could use without problems previous to experiencing the 'yips'.

In 85% of the subjects the 'yips' were first experienced during a tournament whilst playing under pressure. Six of the participants claimed to have been under moderate pressure at the time they developed the 'yips'. For ten of the participants the problem fluctuated and they experienced times of relief. For the majority of the participants (75%) the 'yips' were only experienced in competitive situations. The influence of stress and pressure made the problem worse for all of the participants and relaxation strategies helped for 30%. Many of the participants established 'trick' strategies to try and overcome the 'yips'. Such strategies included changing their putter, changing the grip of the putter, and altering visual fixation on the ball. For six of the golfers other movements were affected by the 'yips', these included writing, playing tennis, table tennis, typing, cricket bowling and snooker. None of the participants showed any abnormality when they were examined neurologically. However, past psychiatric histories were significant for major depression in three subjects and anxiety disorder in one case.

The results of this study were that there were no significant differences for the self-report measures between those with the 'yips' and the control group. The performance on the neuropsychological tests were also not significantly different. The golfers who suffer from the 'yips' did demonstrate higher obsessionality and type A behaviour, however these differences were not significant. A comparison between those who experienced mild cases with those with severe symptoms produced one significant difference on the subjective anxiety rating. However, this self-perception of being higher in anxiety was not detected by the anxiety questionnaires used.

Sachdev (1992) described the general personal characteristics of the typical golfer who suffers from the 'yips' as being middle aged, who has played golf since their teens and develops jerks, spasms and freezing while putting. Sachdev (1992) stated that the problem was exacerbated by stress, yet could also be experienced in practice.

Some important differences are highlighted between the findings of Sachdev (1992) and those of McDaniel et al. (1989). In the Sachdev (1992) study the golfers did not describe the problem as a tremor as did the participants in the McDaniel et al. (1989) study and they also highlighted problems with visual fixation, a factor that is not mentioned by McDaniel et al. (1989). Differences were also apparent between the percentage number of participants who experienced the 'yips' during practice, could overcome the problem with 'trick strategies' and experienced remissions in their ability. A further difference between the two studies was that Sachdev (1992) failed to find that 'yips' sufferers were more obsessional than those who were unaffected. Despite there being no significant differences between those affected and those unaffected on the obsessional scale measure, those with the 'yips' did have a trend towards obsessional thinking. This finding was explained as the golfers were high-achieving individuals and thus, would naturally have a higher level of obsessionality than the general population. Sachdev (1992) concluded that the 'yips' is unlikely to be an anxiety disorder or a neurosis as the affected and unaffected golfers were indistinguishable from a psychiatric and psychological viewpoint. Furthermore, the author interpreted the significant difference in self-perceived anxiety as a consequence rather than a cause of the 'yips'. Sachdev (1992) interprets the role of anxiety in the

'yips' experience as not being a central cause, yet being a necessary factor for the manifestation of the 'yips'. It was also proposed that anxiety exacerbates the problem.

The influence of anxiety on other movement disorders such as writers cramp has not been seen as a causal factor (Harrington et al., 1988; Lishman, 1987) and the 'yips' is considered to hold a similar relationship with anxiety. Sachdev (1992) attempted to explain how the 'yips' could have been misinterpreted as an anxiety based disorder.

> "It is perhaps the occurrence of the 'yips' in stressful situations, the involvement of putting, which is the stroke that usually makes a difference in competitive play, and the lack of any other abnormality that has generally convinced golfers and golf psychologists that it is a psychogenic disorder" (p.331).

The author concluded that 'yips' were a focal dystonia similar to writers' cramp. Ideopathic dystonia shares a number of similar characteristics to those of writers' cramp and the 'yips', these being the success of trick strategies, spontaneous remissions, worsening with stress, fatigue, and emotion, and improvement with rest and relaxation. The presence of anxiety is said to facilitate the manifestation of an underlying organic abnormality. Such an abnormality has been proposed to be a basal ganglia dysfunction (Fletcher & Quinn, 1989; Marsden, Obeso, Zarranz & Lang, 1985). Finally a link was made between the findings of the 'yips' study and that of individuals suffering from Parkinson's disease. Two factors were seen to be relevant, that of gaze fixation and freezing, both of which are characteristic of individuals suffering from Parkinson's disease (Bernstein, 1967; Smith & Wing, 1984). Thus, the 'yips' were seen to have similarities to both dystonia and Parkinson's disease.
The findings from the Sachdev (1992) study show many similar characteristics to that of the McDaniel et al. (1989) research. Both of these studies acknowledge the importance of anxiety, however it is not considered in their conclusions. Both studies suggest that the 'yips' can affect other sports as well as golf, yet the characteristics of other sports were not discussed. In order to make conclusions related to the 'yips'

more general, the experiences of individuals from other affected sports need to be considered. Compensatory strategies such as changes in technique were highlighted as mechanisms for overcoming the 'yips', yet in some sports technical changes are not possible. Examples of such sport actions would include the throw in darts and the cueing action in snooker. Both actions are known to be affected by the 'yips', yet very few modifications to the action itself can be made in order to combat the problem.

A recent study by Smith et al. (2000) investigated the 'yips' in golf from a multidisciplinary perspective. The objective of the research was to determine whether the 'yips' was a neurological problem which is made worse by anxiety or whether it is initiated by anxiety. The study consisted of two phases. In phase one a questionnaire was sent to 2630 tournament players with handicaps less than twelve. Of the respondents 52% perceived that they experienced the 'yips'. The most problematic putts were from 2, 3 and 4 feet and were fast down-hill and left to right breaking. The second phase of the experiment involved a physiological analysis of the 'yips'. The investigators established inclusion criteria to ensure that the participants included in the investigation had the 'yips'. The inclusion criteria were that: (1) golfers were good putters before the symptoms, (2) the 'yips' symptoms were episodic, which is consistent with dystonia, (3) the symptoms had promoted the 'yips'-affected golfers to seek a change in grip or putter. Throughout the testing a series of physiological variables were also monitored. These variables included, heart rate, grip force and muscle activity (EMG) in the upper arm and forearm. Throughout the testing, 'yips'-affected and non-affected golfers were compared. In four putting conditions golfers with the 'yips' had a higher mean heart rate during and after the point of contact with the ball. Similarly golfers with the 'yips' had increased grip force in all conditions. Those with the 'yips' exerted a greater force on the putter initially and this increased during pre-swing initiation. The statistical findings were that golfers with the 'yips' had a significantly higher grip force throughout the putting stroke. Those golfers with the 'yips' also demonstrated greater EMG muscle activity. The mean scores for the 'yips'-affected golfers were higher for the elbow, wrist flexor and extensor muscle groups.

The findings of Crews (2001) support those of Cook (1993) who investigated the EMG activity in affected and non-affected golfers in both high and low anxiety conditions. Cook (1993) found that golfers who suffered from the 'yips' had greater forearm activity in both conditions. Overall putting performance in the Smith et al. (2000) study was assessed in three different conditions, these included an uphill four foot putt, a four foot downhill putt and a flat five foot putt. The results showed that 'yips'- affected golfers tended to finish up to 30% greater distance from the hole and also made fewer first putts. In a trial in which the golfers were required to make ten, five foot putts in succession, those with the 'yips' averaged five putts whereas those without averaged nine putts.

Smith et al. (2000) made a series of conclusions as to the sources of the 'yips'. The findings from the first phase of the investigation suggested that golfers who continue to experience the 'yips' regardless of their grip, putter or putting distance are more likely to be experiencing anxiety than dystonia. This is because technical or postural changes are usually helpful in treating dystonia. Based on their findings the authors proposed that golfers who suffer from the 'yips' fall into one of three groups. The first group are those golfers who develop a dystonia and experience anxiety as a consequence, the second are golfers who are anxious and choke on important putts, and finally a group who experience an interaction of both factors. The authors hypothesised that the largest group of 'yips' sufferers would be the last category. Thus, although anxiety could not fully explain the causes of the 'yips' in itself, the symptoms are made worse in stressful situations. The authors proposed that future research should test the effectiveness of beta blockers and tranquilisers to establish the role of anxiety in the 'yips' experience. Thus, if the problem is purely initiated by anxiety then such aids should result in a decrease in the symptoms and performance should improve. If these do not show improvement then it would be more likely that a neuromuscular diagnosis would be appropriate.

The theorising of Smith et al. (2000) provides the most forward thinking interpretation of the causes of the 'yips'. The McDaniel et al. (1989) and Sachdev (1992) studies concluded that the 'yips' were caused by dystonia and made worse by anxiety,

however, Smith et al. (2000) have acknowledged that the 'yips' could be initiated by a number of factors. Such a perspective accepts the influence of psychological factors in the 'yips' experience regardless of how they are initiated. Further factors that need to be considered in the 'yips' experience are not only the initial cause of the problem but also the subsequent effects of the initial breakdown. Within this process psychological characteristics cannot be ignored and could play a considerable role in the development of the problem from being a single case breakdown in performance to a long-term disorder. Such psychological characteristics could help to explain why some individuals experience this phenomena and others are not affected.

To date there have not been any studies in the sport psychology literature that have specifically investigated the 'yips' in sport. Hence, the present research attempts to investigate the characteristics of the 'yips' from a psychological perspective. Such an approach could provide evidence for the role that psychological variables have in the experience of the 'yips' in sport.

2.9. SUMMARY AND AIMS OF RESEARCH

The preceding review of literature has shown that very little research has looked specifically at the psychological aspects of the 'yips' in sport. Many theoretical perspectives have been described and discussed that could be associated with the breakdown of automatic skills, yet few connections have been made directly between these phenomena and the 'yips', in the academic literature. The aim of this research was to investigate the psychological characteristics of the 'yips' experience and establish whether this phenomena was associated with models of choking (Baumeister, 1984). The specific focus of the research was to examine the psychological mechanisms that underpin the experience of the 'yips', both prior and subsequent to their onset. Such an investigation may also provide insights into the personality traits that are particularly prone to experiencing the 'yips'. Establishing the aetiology of the 'yips' was not a specific aim of this thesis, however, the various research studies could provide insights into potential causes of the problem. Thus, the following specific research aims were generated:

1) To identify the psychological mechanisms of the 'yips' experience.

2) To explore the relationship between the dominant psychological mechanisms of the 'yips'.

3) To examine the relationship between the 'yips' and Baumeister's (1984) model of choking.

4) To identify psychological coping strategies that could be used to counter the 'yips'.

3.0. STUDY 1 (part 1). A QUALITATIVE INVESTIGATION INTO THE PSYCHOLOGICAL CHARACTERISTICS OF THE 'YIPS'

3.1. INTRODUCTION

The execution of a routine motor skill for an experienced performer is habitually performed without conscious control and is therefore automatic in nature (Schneider, Dumais & Shiffrin, 1984). However, for individuals that experience the 'yips' such a task can become almost impossible. The 'yips' have been defined as a motor phenomenon that consists of involuntary movements occurring in the course of the execution of finely controlled, skilled motor behaviour (McDaniel et al.,1989). The majority of the evidence surrounding the 'yips' has come from anecdotal sources in golf, darts and cricket (Moody, 1993). Explanations for why and how the 'yips' occur have been scarce in the academic literature.

Explanations for how the 'yips' are caused have been contradictory in the academic literature. McDaniel et al. (1989) concluded that the 'yips' in golf were a focal dystonia and were made worse by anxiety. They suggested that three major factors were discriminatory between golfers with the 'yips' and those without. Golfers with the 'yips' were older, had played golf for longer, and endorsed one item regarding obsessional thinking. Despite this finding the authors stressed that the 'yips' were a performance problem that needed further enquiry. They concluded that the precise nature of the problem could not be determined and that their investigation should be seen as a first step in understanding the disorder. These findings were supported by Sachdev (1992). Smith et al. (2000) provided a different account of the 'yips': the authors proposed that the majority of 'yips' sufferers were experiencing an interaction between anxiety and dystonia-related symptoms. Masters' (1992) research into conscious processing led him to postulate that the 'yips' could be an extreme form of choking and are therefore psychologically based.

There has been a wealth of research that has investigated the effects of choking in sport (Baumeister, 1984). Choking is described as a 'one off' negative performance experience, whereas the 'yips' can result in permanent performance debilitation.

However, no research studies have investigated the experiences of those that have been afflicted by the 'yips'. Such a qualitative approach to the problem can examine the similarities and differences between individual's experiences. A further consideration for this study was that the 'yips' in cricket players has not been documented in the academic literature.

The primary purpose of this study was to explore the psychological characteristics of the 'yips' experience in cricket bowlers and to establish whether common characteristics existed between their experiences. A second aim of the study was to establish individual perceptions of bowlers' experiences before, during and after their first experience of the 'yips'. A further aim of this investigation was to establish whether the 'yips' in cricket bowlers showed similar characteristics to those reported by McDaniel et al. (1989), Sachdev (1992) and Smith et al. (2000) in golfers. Such a comparison could provide information as to whether the causes of the 'yips' in bowlers are physical or psychological. Finally this study sought to examine whether the experience of the 'yips' in cricket demonstrated similar characteristics to the model of choking as outlined by Baumeister (1984).

3.2. METHOD

Participants

The 8 male participants in this study (mean age = 23.4 years, range = 18 - 32 years) were all bowlers in cricket. The participants were club (n=4) and semi- professional standard (county second team) (n=4) and had an average of 11 years bowling experience. Of the 8 participants 5 were right arm medium pace bowlers and 3 were slow bowlers (one left arm and two right arm bowlers). The criterion for participation in this investigation was that each player had experienced a dramatic long-term loss in their ability to bowl over the last two years.

Procedures

Contacting Participants. All cricketers were contacted and informed of the nature of the investigation. Participation within the study was voluntary, participants remained anonymous and all data were kept strictly confidential. The participants were informed of the protocol of the investigation which involved a semi-structured interview. A number of ethical issues needed to be considered when contacting the participants. The first of these concerned the nature of the topic that was going to be researched. Due to severity of experiencing the 'yips' all the participants had to be fully briefed about the nature of the research. For many of the cricketers, experiencing the 'yips' had resulted in retirement from the sport, or ended a potentially successful career. Thus, it was considered essential that all potential participants had a good understanding of the issues that they were likely to be discussing and that they were happy to talk about these from a personal perspective before agreeing to take part in the investigation. This process was administered through an informed consent form (see Appendix 2). All participants provided written consent before taking part in the study.

The Interview. The interview comprised five main sections: (a) introductory comments, (b) description of the first experience of the 'yips', (c) conditions before the first experience of the 'yips', (d) description of subsequent bowling experiences, (e) final comments and summary questions. The rationale for the inclusion of these five main sections was that the interviewer required a broad personal perspective of the 'yips', which could identify relevant information, before, during and after the initial experience. The interview was required to have some structure, however, it was intended that the participants responses would dictate the flow of questioning.

To standardise the interview procedures an interview guide (see Appendix 3) was established. The interview guide contained the main lead questions and also some elaboration probe questions (Gould, Jackson & Finch, 1993b; Scanlan et al., 1991).

At the start of the interview the cricketers were informed that the interviewer was specifically interested in their apparent loss of ability to bowl and that this would be the focus of the interview. For the duration of the interview the interviewer did not use the term the 'yips', instead, the breakdown of bowling performance was referred to as 'the experience'. A dictaphone was used to record all the interviews which lasted between 60 and 90 min. An interview guide provided a logical structure for the interview and ensured that each participant received a similar protocol. All questions were open-ended. The participants were asked to consider each question in their own time and to recall as accurately as possible their thoughts, feelings and emotions related to that specific question. If the participants could not recall any specific information they were instructed not to try and guess. When the participant was happy with the interview environment the following open-ended question was asked:

> "The focus of this study is to gain an understanding of your apparent loss of ability to bowl. Could you describe for me the first occasion when you felt that there was a problem with your bowling ?"

Once participants had recounted their initial experience, they were asked general probe questions (Patton, 1990) to elicit further information. "Can you describe for me any further thoughts, feelings or emotions that you experienced during this bowling performance ?". Specific elaboration probes were also used to expand on the participants bowling experiences (Scanlan et al., 1991) e.g."What was it about these thoughts that made them important during this bowling experience?". Clarification probes were used to encourage the participant to repeat any information that the interviewer did not fully understand or felt needed further explanation e.g "Could you explain that in more detail please?". A general final probe was asked before proceeding to the next section of the interview to ensure that each participant had discussed all the information that was relevant to this section e.g, "Can you think of any other prominent thoughts, feelings or emotions that were important during this bowling experience".

Transcribed interviews (see Appendix 4) were content analysed using the procedures successfully adapted to sport research by Gould et al. (1993a, 1993b) and Scanlan et al. (1991). Two researchers read and reread the transcribed interviews until they felt that they were familiar with the data. All additional information related to the transcribed interviews were included through the use of bracketed notes (e.g "replying ironically" or "emphasises word"). Inductive content analysis was carried out on the transcribed text. The rationale for using inductive content analysis was that the procedures allow the experimenter to explore the raw data in a way where general themes can be established. When researching a new phenomenon like the 'yips' the experimenter has very little knowledge about the themes which could emerge. Thus, the interview questions have to be general and the raw data themes guide the whole analysis procedure . This approach is somewhat different to deductive content analysis in which the experimenter has a good understanding of the raw data which could emerge from the interviews. The inductive content analysis followed the procedures outlined by Scanlan et al. (1991), Gould et al. (1993a, 1993b) and Patton (1990). The content analysis required the researcher to organise the raw data into interpretable and meaningful themes and categories using inductive procedures. The analysis allows general themes to emerge from the raw data provided by the participants. Initially the quotations and phrases were clustered together and then a label was attributed to this cluster to form a higher order theme. In some cases further generality was required at this level and therefore second higher order themes were included. The highest level of generality was labelled the general dimension. The credibility of this analysis was maintained through a process of triangulation between the two researchers and an external independent researcher. The role of this researcher was to establish external validity.

3.3. RESULTS AND DISCUSSION

Analysis facilitated the identification of 15 general dimensions that comprised fifty higher order themes which in turn were generated from 329 raw data themes (See

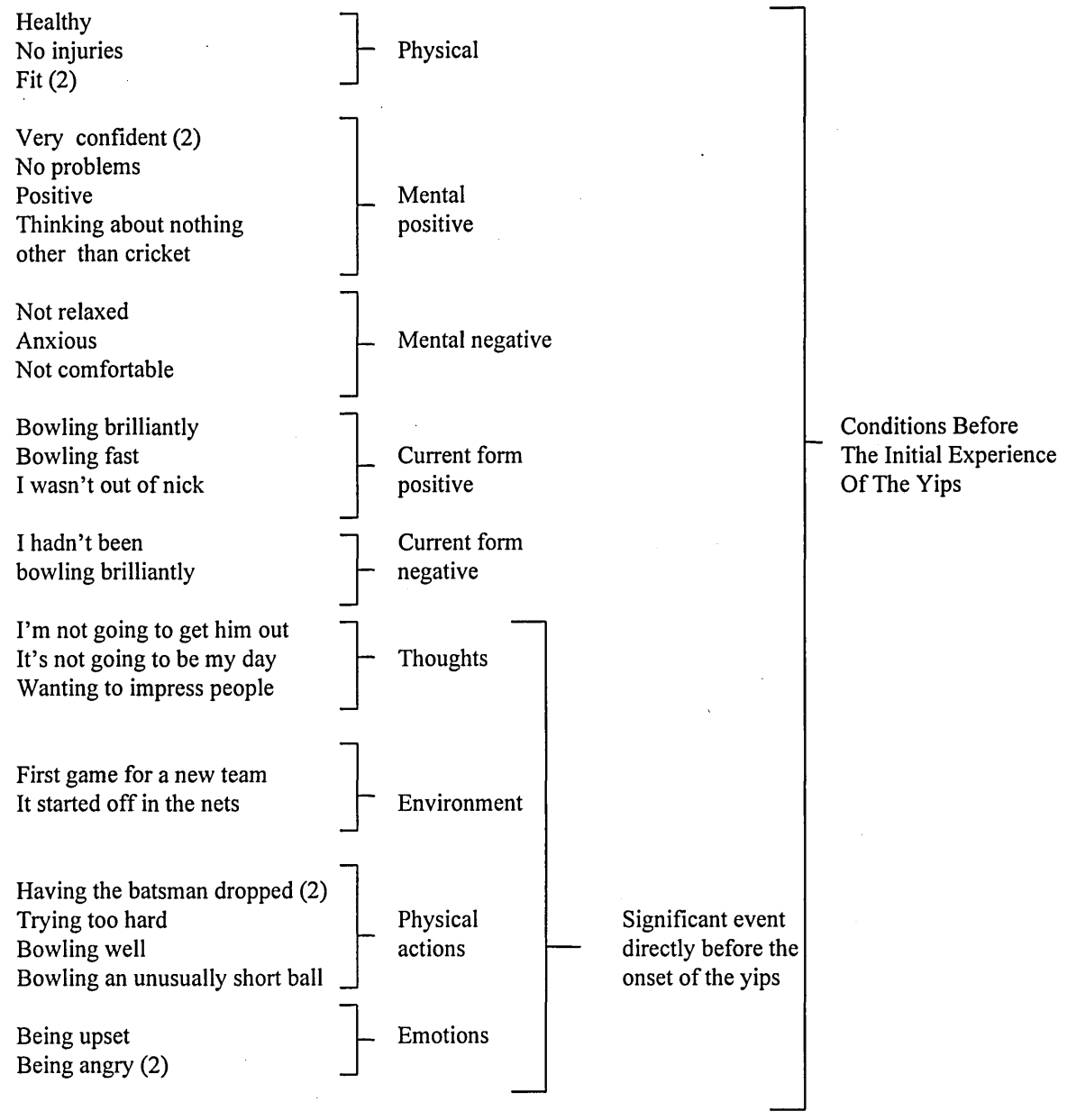
Figures 3.1 - 3.15). The triangulation assessment produced an 85 per cent agreement in the raw data themes and 100 per cent agreement for the higher order themes. The results were separated into seven sections, these were (1) Conditions before the first experience, (2) Perceptions during the initial experience of the yips, (3) Bowling performances post the initial experience of the yips, (4) Perceptions of future performances, (5) The experience of the yips on reflection, (6) Characteristics of good bowling performances, (7) Personal characteristics.

Conditions Before the First Experience

This general dimension comprised five higher order themes, one second order theme and 8 per cent of the total number of raw data themes (see Figure 3.1). The five higher order themes were: physical readiness, mental positive, mental negative, current form positive and current form negative. The second higher order theme established from the data was significant event before the onset. This general dimension was concerned with how the bowlers felt directly before they experienced the 'yips' for the first time.

None of the participants in this investigation reported that there was anything physically wrong with them prior to their initial experience of the 'yips'.

Figure 3.1 - Conditions Before The First Experience Of The Yips.



Numbers in parentheses (for all figures) reflect numbers of athletes citing exact raw data theme (when >1)

Mentally there were differences between the participants in this study. Some of the cricketers did not feel mentally relaxed before performing and stated that they felt 'anxious' and 'not comfortable'. A similar trend was identified for current form. Of those individuals who made reference to their current form, three bowlers stated that their performance was positive whilst two of the participants felt that their current form leading up to the experience had not been good, yet was not a concern to them. Of those individuals who made reference to their current form three of the bowlers stated that their performance was positive whilst two of the participants felt that their current form leading up to the experience had not been good.

Participants made reference to important events that had happened directly prior to the onset of the 'yips'. Two of the bowlers stated that they had lost their temper with a team mate due to them dropping a catch from their bowling. One bowler stated "I opened the bowling and things were okay , then I bowled one specific ball to a left hander, he edged the ball and the fielder dropped him. I lost it a little bit, I told the guy that's not good enough.....I walked back and then 'Jesus' the ball just didn't want to go straight."

The First Experience of the 'Yips'

This general dimension comprised three higher order themes from 15 per cent of the total number of raw data themes (see Figure 3.2). The three higher order themes were: having no sensation that it was going to happen, the physical response and the outcome of the delivery. A key finding from this research was the fact that none of the participants had any sensation that they had a problem with their bowling until the onset of symptoms developed. This point was emphasised by a participant "...at first my concern was, what's happening here, where did this come from. I mean it was just out of the blue, it really was out of the blue, I can't stress that enough, it's like one ball was the key defining moment". Another participant clearly described the moment when he first felt the onset of the 'yips': "...as I got to the top of my run I just thought 'how do I let go of the ball'....and suddenly the ball was stuck in my hand, I was all tense, so I just bowled the ball and it bounced twice, and I thought 'hello, what's

Figure 3.2 - The First Experience of The Yips

Raw data Theme	Higher Order Theme	General Dimension
I had no sensation it was going to happen It just went It really is just out of the blue It's like one ball in time was the key moment It suddenly happened The ball just didn't want to go straight it was that specific moment	Having no sensation that it was going to happen	The First Experience Of The Yips
It felt like I was holding onto the ball too long My hand didn't want to let go of the ball My fingers would not open It felt as If my hand was not behaving the way it used to Something happens to your hand The control in my hand had gone It felt as if my shoulder had locked up It was like I didn't have any co-ordination My hand felt as if it was cocking to the leg side Felt a muscular strain in my hand Increased muscle tension in my hand Too much tension in my fingers The wrist feels like it is moving across I couldn't let go of the ball I could feel that my arm was finishing in a cramped position It felt as if my shoulder was down by my hip I was losing my run up The ball was stuck in my hand I didn't feel in control Your arm feels like it isn't yours It seems like you have no power over your actions	Physical responses	
Wides Full tosses Beamers Not being able to hit the pitch Ball bouncing twice (2) Ball going over the wicket keepers head Ball bouncing half way down the wicket Ball running along the ground Bowling no balls (2) Overstepping Ball bounced three times (2) Over pitching Under pitching Bowling to the leg side Bowling short The ball landed three feet in front of me	Outcome of the deliveries	

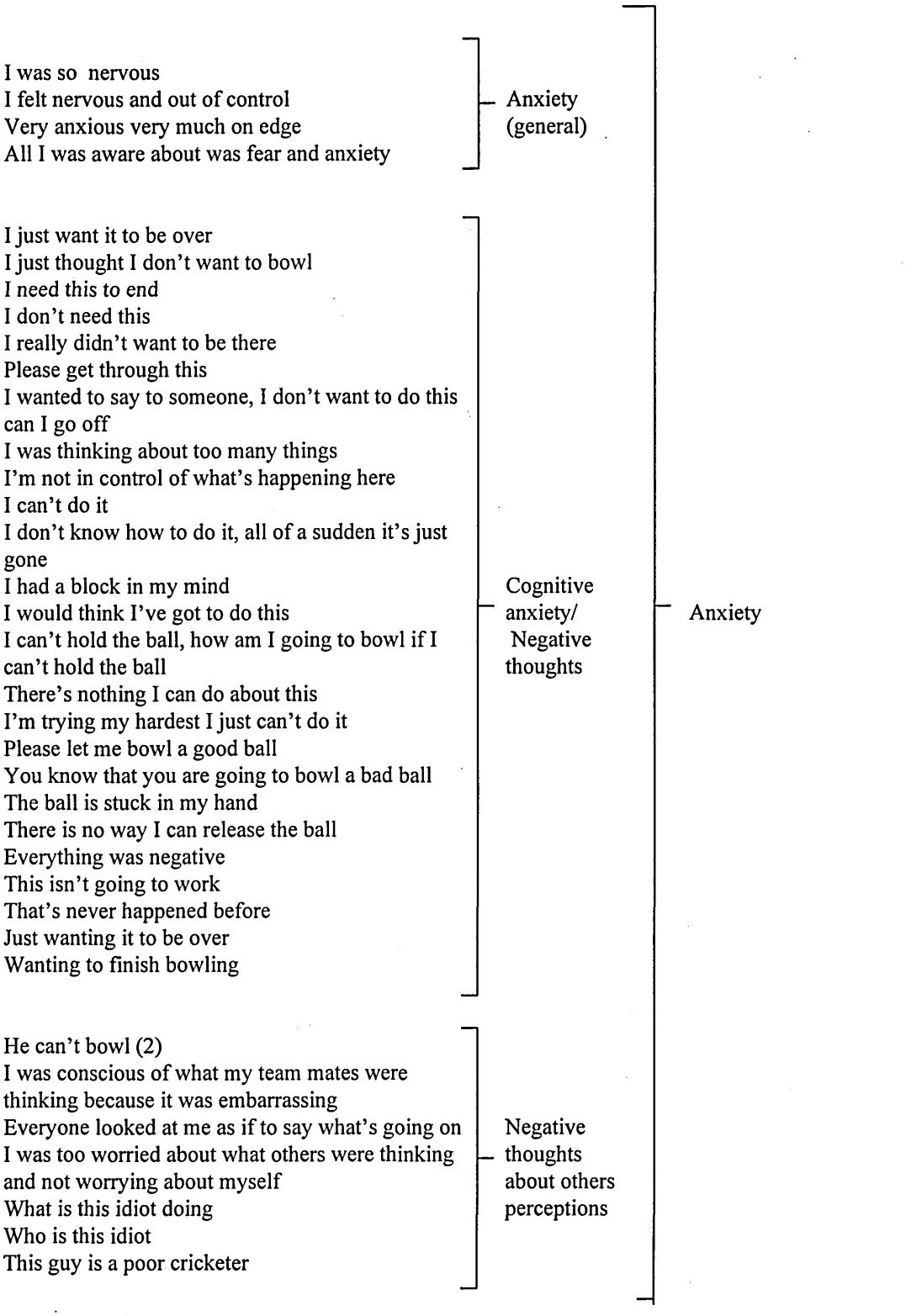
going on here". All of the participants in this study stated that their bowling action felt different physically during this first experience. Many of the bowlers experienced a change of feeling in their hand. A common comment made by the bowlers was that the ball felt as if it was difficult to release and that they didn't have control over it. One bowler stated "My main thought was that the ball was stuck in my hand and that I couldn't release it.". Another said "it felt as if my hand was not behaving the way it normally used to, it was cocking towards the leg side". The actual outcome of the deliveries bowled, ranged from not being able to release the ball at all, to bowling the ball over the batsman's head.

Perceptions During the First Experience

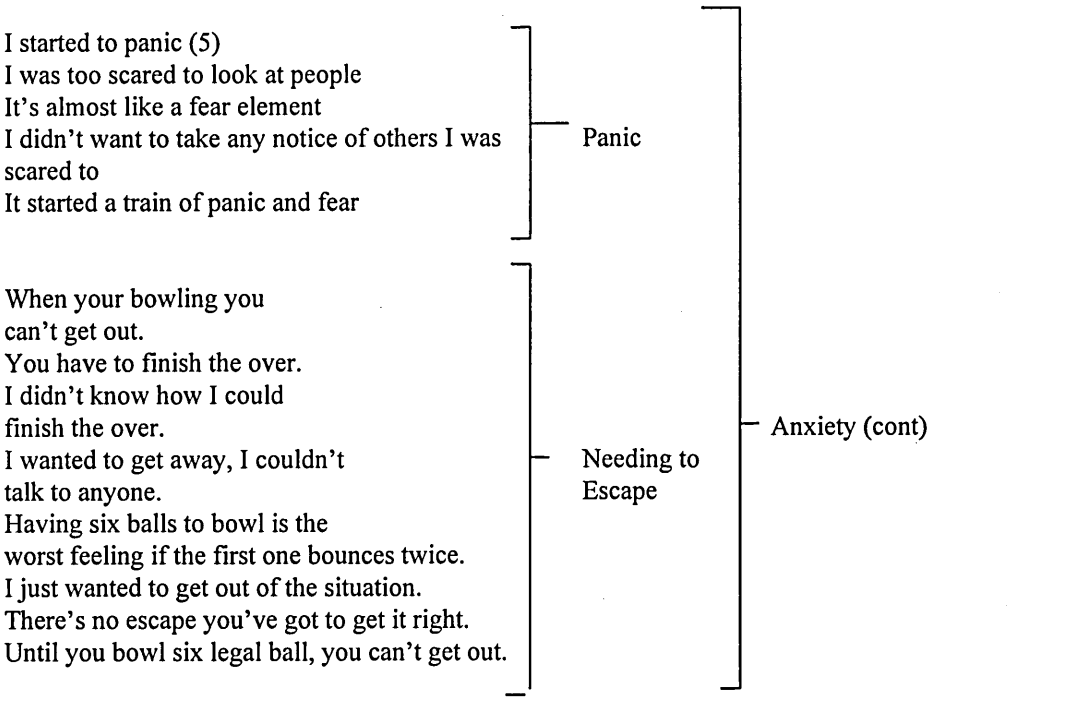
Anxiety. This general dimension comprised 5 higher order themes from 15 per cent of the total number of raw data themes (see Figure 3.3). These themes were anxiety (general), cognitive anxiety, negative thoughts of other people's perceptions, panic and needing to escape. It appears that anxiety was a predominant characteristic during the first 'yipped' bowling experience for all of the participants interviewed. The anxiety responses appeared to be closely linked to the individual's perceptions of having 'no control' over their actions. One participant when describing the anxiety response stated "in all my sport I've never experienced anything so terrifying, thinking 'I can't do this.....It was terrifying in that I thought this is just me being stupid, you know, I've got no control over it, no matter what I'm doing I just can't do such a simple task.". Another said "I felt very nervous and out of control....I know it sounds stupid but it was like I'd been taken over, I just couldn't do it".

The fact that in cricket the bowler has to perform 6 legal deliveries in order to complete an over also appeared to increase the anxiety response. This is because it is only when the over has been completed that the bowler can be changed. The outcome of the majority of 'yipped' deliveries meant that the bowler had to repeat that delivery. This led to many of the bowlers feeling 'trapped' in the situation and thus led to a panic response. One bowler reported "There's no escape..... you're there, you've got to get it right, until you get six legal balls.....you can't get out of it.....it just

Figure 3.3 - Perceptions During First Experience (Anxiety).



Figures 3.3 (cont) Perceptions During Initial Experience Of The Yips.



Figures 3.4 Perceptions During Initial Experience Of The Yips (Emotions and Feelings).

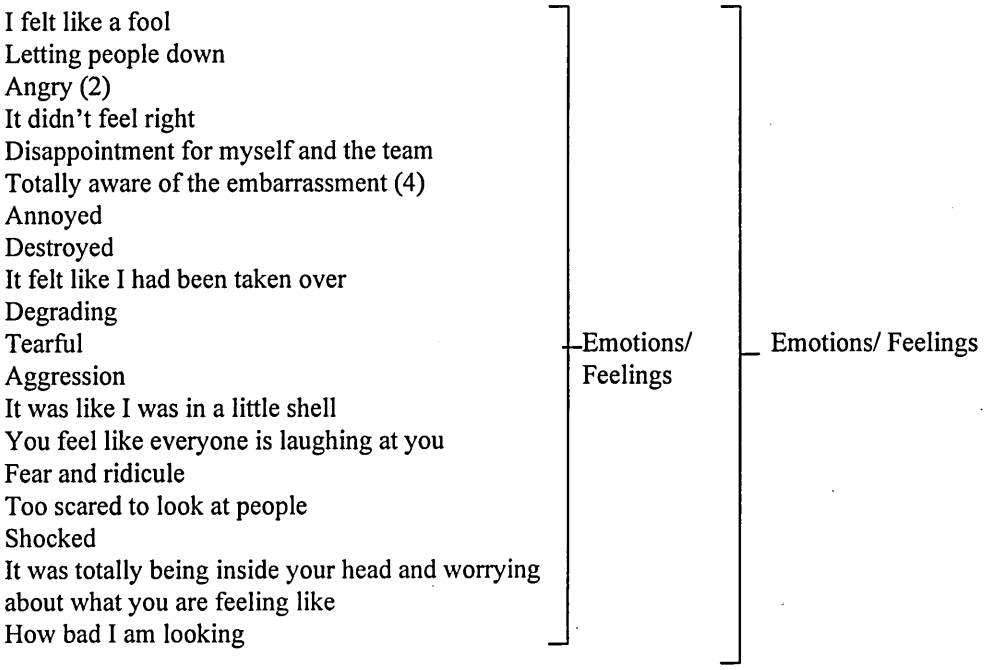


Figure 3.5. Perceptions During Initial Experience Of The Yips (Conscious Control)

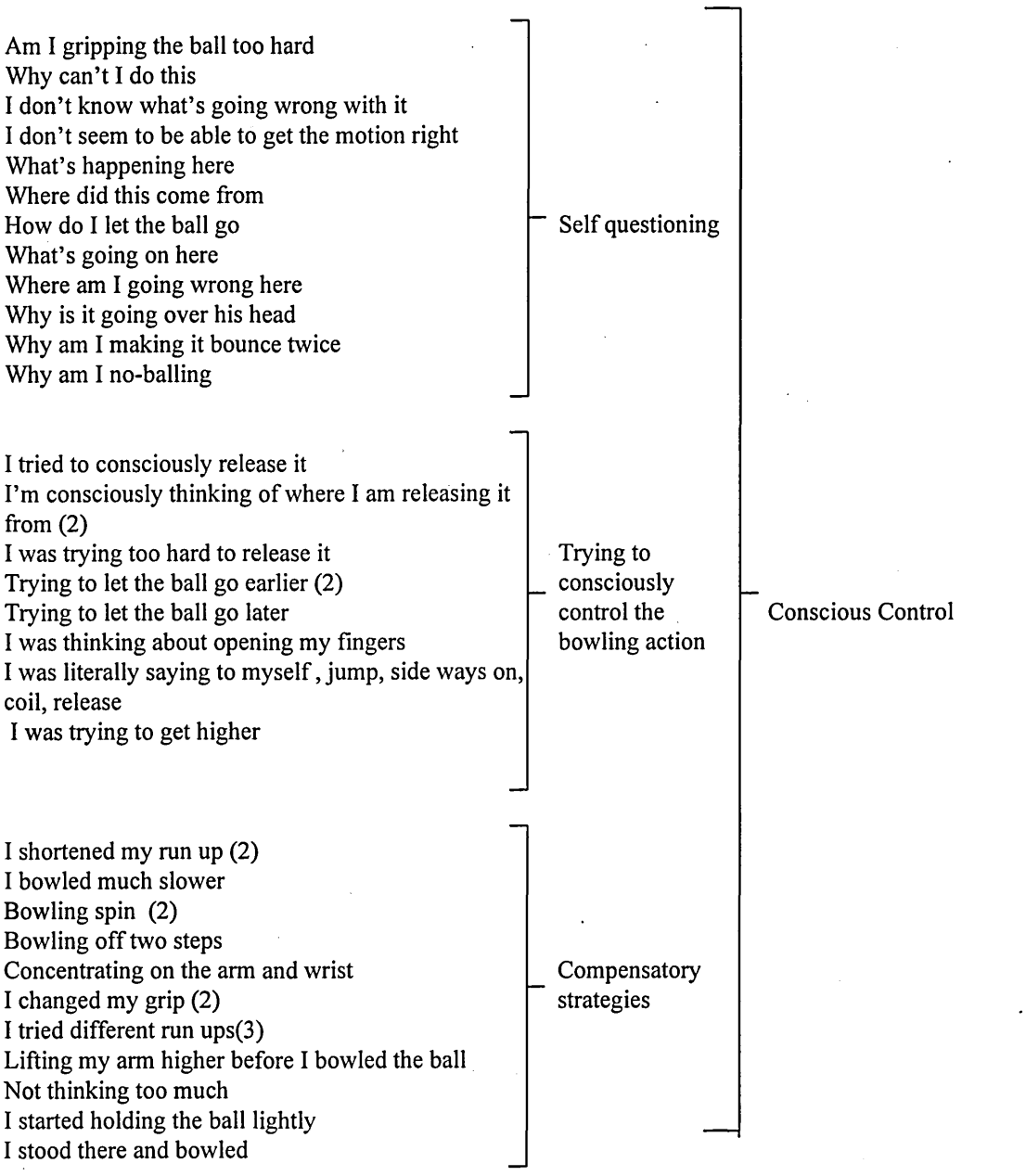


Figure 3.6. Perceptions During Initial Experience Of The Yips (Self-Presentational Concerns)

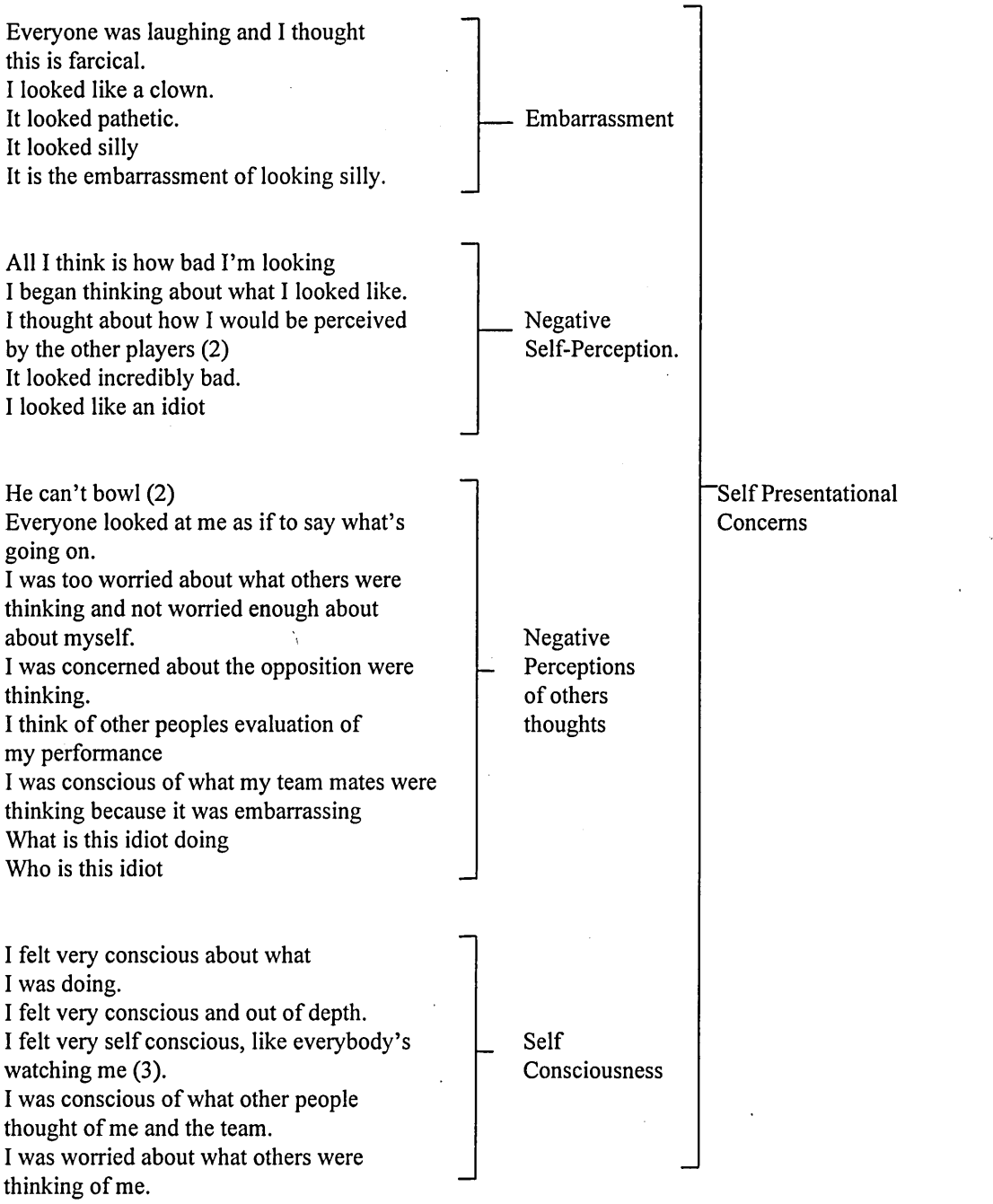
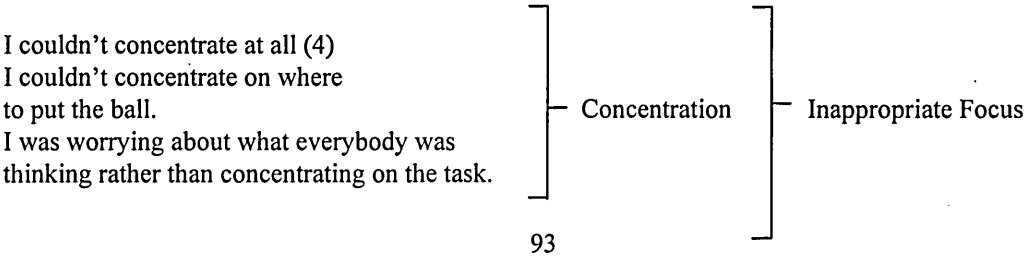


Figure 3.7. Perceptions During Initial Experience Of The Yips (Inappropriate Focus)



seems like you've got no power over your actions" another stated that the major source of their anxiety was that "you can't get out, you have to finish the over,..... until you do, the game can't continue". This panic response was described by one bowler as "After I bowled a wide, I would think 'it's happened again' I would really panic then".

Throughout the bowling experience the participants claimed to be preoccupied with negative thoughts and were unable to clear these from their mind. One bowler stated "it's just something weird, it just stays in your head, you can't get it out of your head, when you go up to bowl you know that you are going to bowl a bad ball". Another bowler commented "mentally you just seize.....it's just negative, before, you think this isn't going to be right, you can't imagine yourself bowling properly". Many of the bowlers explained how they felt trapped in the situation and how they just wanted the experience to end. A bowler stated "People say it's a great advantage to have six balls to bowl, but it's the worst sensation in the world if your first one bounces twice because that means you've still got five more".

Emotions and Feelings. This general dimension comprised of one higher order theme from 6 per cent of the total number of raw data themes (see Figure 3.4). Throughout this initial experience of the 'yips' the bowlers felt a wide range of emotions, these ranged from pure shock to feeling destroyed. One bowler commented "I felt quite tearful and sweaty and my heart was pumping and I'm not that kind of person at all, I'm quite laid back that way, but I was just shaking terribly".

Conscious Control. This general dimension comprised 3 higher order themes from 9 per cent of the total number of raw data themes (See Figure 3.5). The 3 higher order themes were self-questioning, trying to consciously control the bowling action and compensatory strategies. It appeared that after the bowlers had delivered a number of poor balls they started to question why their performance was breaking down. One bowler stated "I was focusing on the task but trying to think, where am I going wrong here ? Why is it going over his head ? Why am I no-balling ? Why am I making it bounce twice ? It just feels like the ball is stuck in your hand and your arm

feels like it isn't yours". The next stage of this process was that the bowlers attempted to consciously control the bowling action to compensate for the poor deliveries. A bowler commented "I was telling myself when to let it go (the ball), because I realised I was not letting the ball go at the right time so I was saying to myself 'let it go' and of course you can't say that because by the time you've said that your arm is down on the ground". As a final strategy to try and compensate for the erratic bowling performance the bowlers attempted to fundamentally change their bowling style. Such changes included shortening the run up, bowling at a slower pace and changing the manner in which the ball was gripped.

Self-presentational Concerns. This general dimension comprised 4 higher order themes, from 6 per cent of the total of raw data themes (see Figure 3.6). The 4 higher order themes were embarrassment, negative self-perception, negative perception of others' thoughts and self-consciousness. The way the bowlers were perceived by others appears to have been very important during their performance. Many of the participants felt extreme embarrassment throughout the experience. One bowler said "My heart started racing, my mind was just elsewhere completely, it was just feeling totally aware of the embarrassment that I was feeling" another said "I don't think other people understand how embarrassing it is". The participants also became very focused on what other people would be thinking about this bowling display. A bowler stated "I was too worried what others were thinking and not worried enough about myself" another said "I just wanted it to end, I just didn't want to bowl anymore, I just looked like a clown...the thing that I love, the thing that I really wanted to succeed at and I've tried the hardest ever to do and I'm looking like a flipping clown".

Inappropriate Focus. This general dimension comprised one higher order theme, from 1 per cent of the total raw data themes (see Figure 3.7). The higher order theme was poor concentration. The bowlers felt that they were unable to get focused on the task because they were pre-occupied with other factors such as how their performance would be perceived by others. One bowler stated "I couldn't concentrate on what I was doing, my mind was just full of panic and confusion".

Negative Thinking. This general dimension comprised of two higher order themes, from 3 per cent of the total of raw data themes (see Figure 3.8). The two higher order themes were negative thoughts, and negative feelings and emotions. After the first experience of the 'yips' the bowlers felt a range of thoughts and emotions. The major responses were that they had embarrassed themselves publicly and that they had let themselves and their team mates down. One bowler described his thoughts directly after the match " I just thought, I don't want to be amongst these people (team mates and opposition). I've embarrassed myself.....I was thinking that they would be talking about it (his bowling) and having a laugh at my expense".

Perceptions of Future Performances. This general dimension comprised three higher order themes from 6 per cent of the total number of raw data themes (see Figure 3.9). The three higher order themes were fear of failure, avoidance and negative visualisation. It appears that the participants in this study fear bowling in the future because they anticipate that they will have a similar experience. Therefore, they try to avoid bowling at all costs. The result of this was that they have attempted to make excuses so that they no longer have to bowl. One bowler commented "I will always find excuses not to bowl now". This negative perception appears to be based on fear of failing and also fear of looking incompetent in front of others. A bowler stated "I would be terrified to bowl, I would think I'm going to bowl a 16 ball over in front of all these people, they are just going to laugh at me". The fear of failure was also related to the fact that the bowlers felt that they did not have control over their actions and they fear experiencing that same lack of control. A bowler stated "It's happened before and I couldn't do anything about it, it will happen again". Five of the bowlers made reference to being unable to visualise themselves bowling successfully after experiencing the 'yips'. One bowler commented "I used to see myself bowling well before I played, now whenever I try and imagine myself bowling, it just goes wrong, I can't see it going well at all".

Figure 3.8 - Perceptions Post First Experience (Negative Thinking)

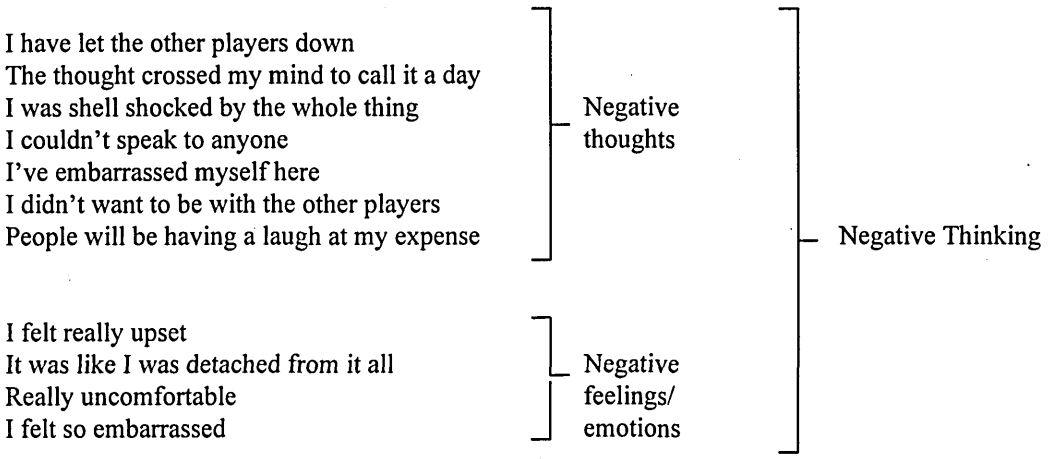
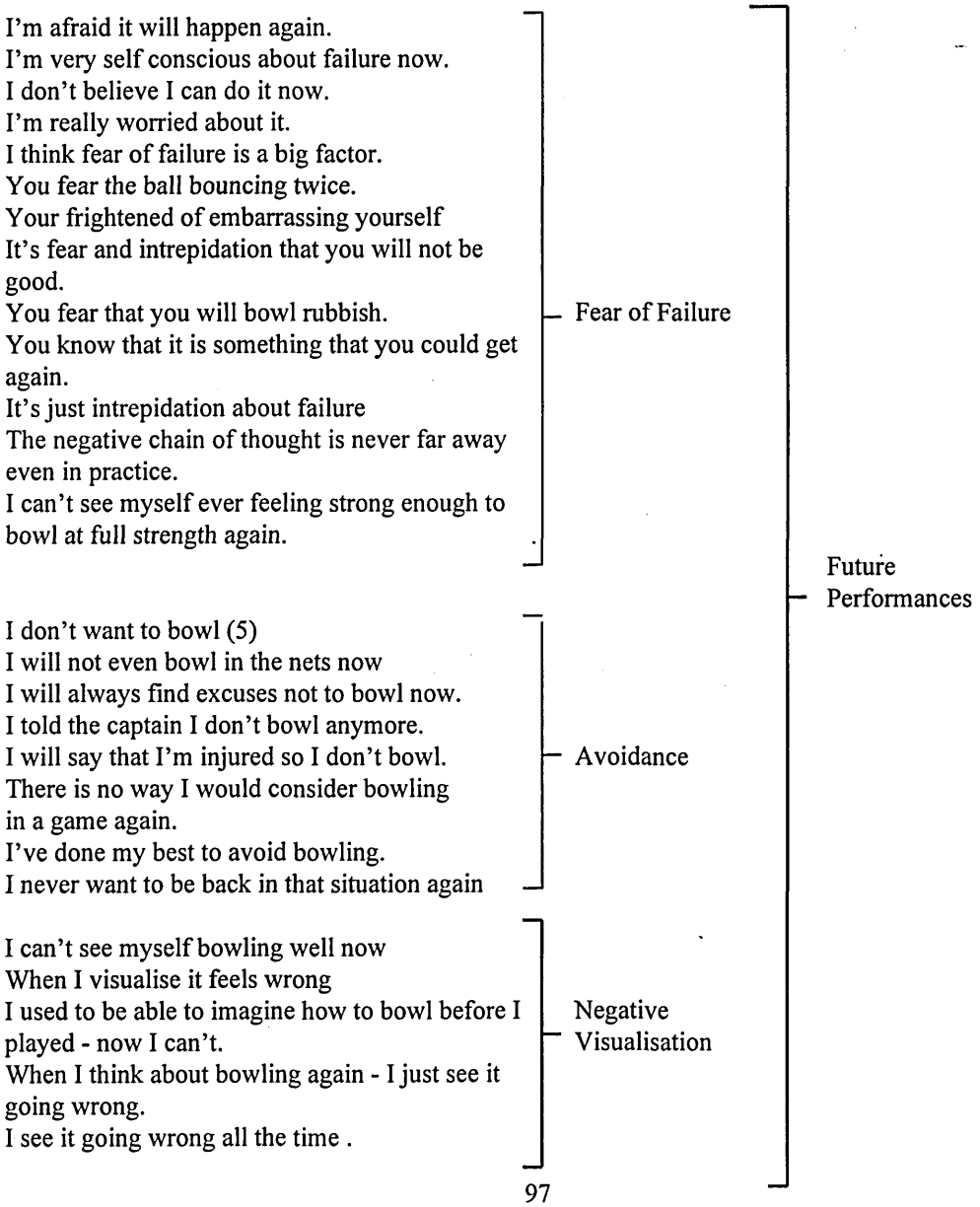


Figure 3.9 - Perceptions Post First Experience (Future Performances)



Reasons for not wanting to Bowl This general dimension comprised four higher order themes from 6 per cent of the total number of raw data themes (see Figure 3.10). These higher order themes were lack of confidence, self-presentational concerns, credibility and the simplicity of the skill. All the bowlers stated that their confidence has been severely diminished since experiencing the 'yips'. This was coupled with the fact that the bowlers fear being perceived as incompetent by relevant others. They feel that if they are seen to be unable to perform a skill that should be simple to them then their credibility as a cricketer will decrease. The simplicity of the skill itself appears to be a significant factor and is a strong contributor to the anxiety response. A bowler stated "I just can't do such a simple task, a task that I have been able to do since I was 8 years old".

Bowling Experiences Post the Initial Experience

This general dimension consisted of two 2nd order themes and six higher order themes from 7 per cent of the raw data themes (see Figure 3.11). The 2nd order themes were negative and positive experiences. The higher order themes were negative experiences in practice, negative experiences in matches, positive experiences in practice, positive experiences in matches, reasons for temporarily regaining form and the difference between bowling in practice and in a match. Each of the participants' bowling experiences after the initial experience were different. All of the bowlers have been able to 'get it back' at different times, yet all have subsequently 'lost it again'. Many of the positive bowling experiences have been in the practice environment. One bowler stated "I could get it back in the nets (practice) yet I couldn't get it back in a match" another said "Whenever I bowl in the nets I am probably the best bowler in the club, but get me in a match and it (the ball) could go anywhere". Explanations for why individuals have been able to bowl well again ranged from not thinking about bowling to simply having lots of practice.

Figure 3.10 - Perceptions Post First Experience

(Reasons For Not Bowling Now)

Raw data Theme	Higher Order Theme	General Dimension
I feel I've just got no confidence to bowl (2) It feels like a confidence problem now. It started to effect my confidence. My confidence has gone I would be a more complete cricketer if I had the confidence to go out and bowl. I lost my confidence in myself (2) It's a general loss of confidence.	Lack of Confidence	Reasons For Not Bowling Now
I don't want to make myself look like an idiot. I don't want to look stupid in front of people. I'll make a fool of myself It's basically a fear of looking silly People will laugh at me.	Self Presentational Concerns	
Credibility My credibility is at stake. My credibility is going to go down. I'll look stupid so I don't do it anymore.	Credibility	
I can't perform a simple skill I could bowl since I was 8 now I can't Embarrassment because it is such a simple skill Because it's such a basic task I should be able to bowl with my eyes shut It's humiliating bowling like a novice	Simplicity of the Skill	

Three of the bowlers stated that they have been able to get it back in match situations in phases and this was usually when there was a great deal of pressure on them to bowl well. A bowler commented "The more pressure on me in the game, the better I have bowled". However, another bowler contradicted this by stating "When there's nothing at stake I can bowl fine". One bowler explained how it was possible to re-gain their form yet they still feel vulnerable to the 'yips', "You could bowl for a whole season and be fine, but when you bowl one ball at your foot then you are back at square one". Another commented "The negative train of thought is never far away, even in practice". All of the participants in this study stated that they have had numerous bowling experiences similar to the first experience of the 'yips' despite them being able to re-gain their form temporarily, in phases. It is these repeated experiences that have reinforced their lack of confidence in their ability to bowl. A participant said "Once you know you are capable of bowling a ball at your feet, then you know that it could happen every time you run up to bowl".

The Difference Between The Yips and Bowling Badly

This general dimension comprised one higher order theme from 3 per cent of the raw data themes (see Figure 3.12). All the participants emphasised the clear difference between bowling badly and bowling with the 'yips'. A bowler commented "I have bowled an over that is well beyond a bad bowler's over, it was like I didn't have any co-ordination and to me, someone thinking that I am not co-ordinated, I really hate that". The participants continually emphasised that their experience with the 'yips' was not related to a temporary loss of form or simply a bad spell of bowling, it was far more extreme than that. A bowler commented "I'd never bowled anything like that before, there was a hell of a difference. I've never before in my life run up and bowled a ball that has bounced three times, and that was happening regularly, I've never bowled a ball that hasn't gone on the cut before, a bad ball to me was a ball that was reasonably wide".

Figure 3.11 - Bowling Experience Post The Initial Experience.

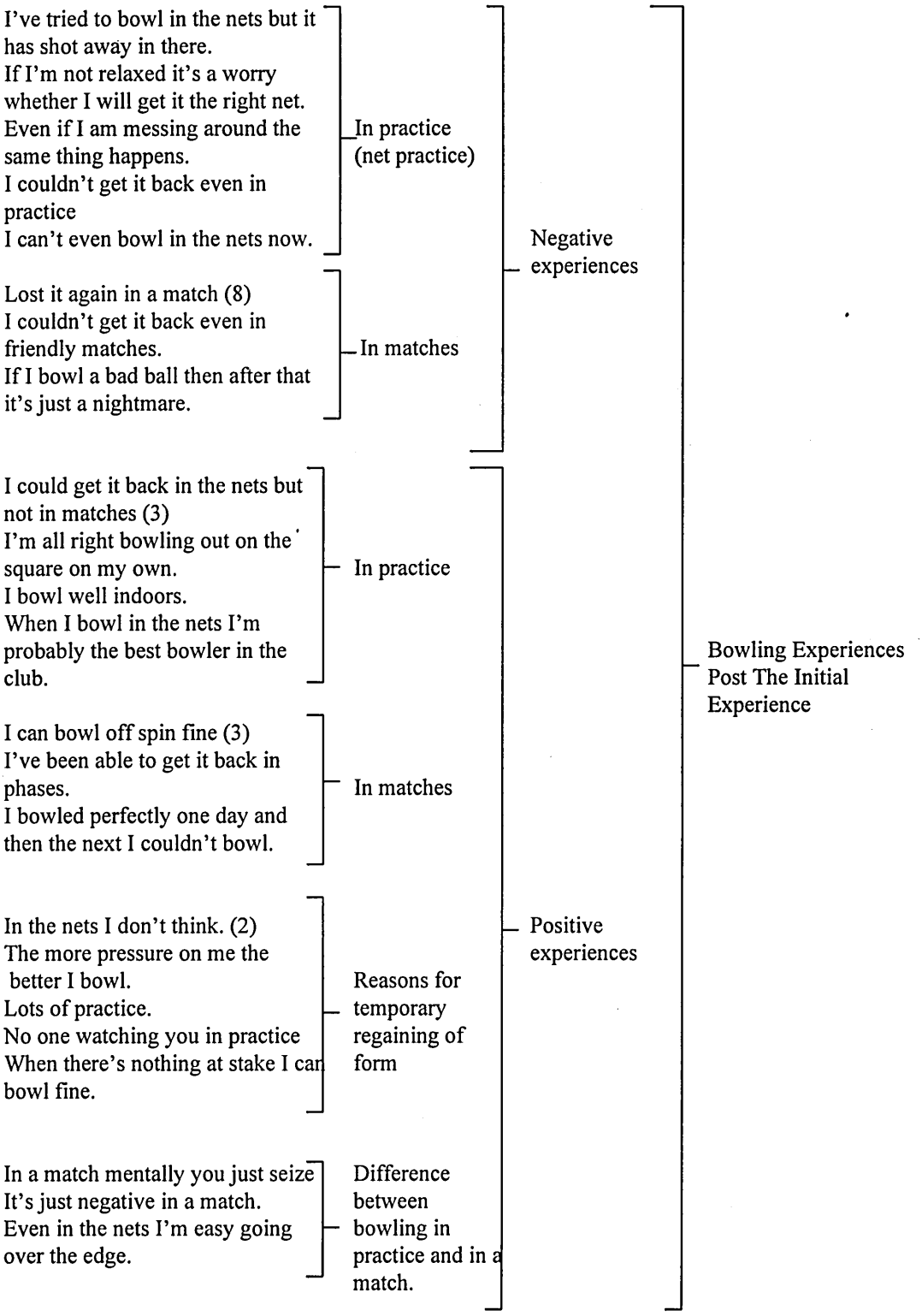
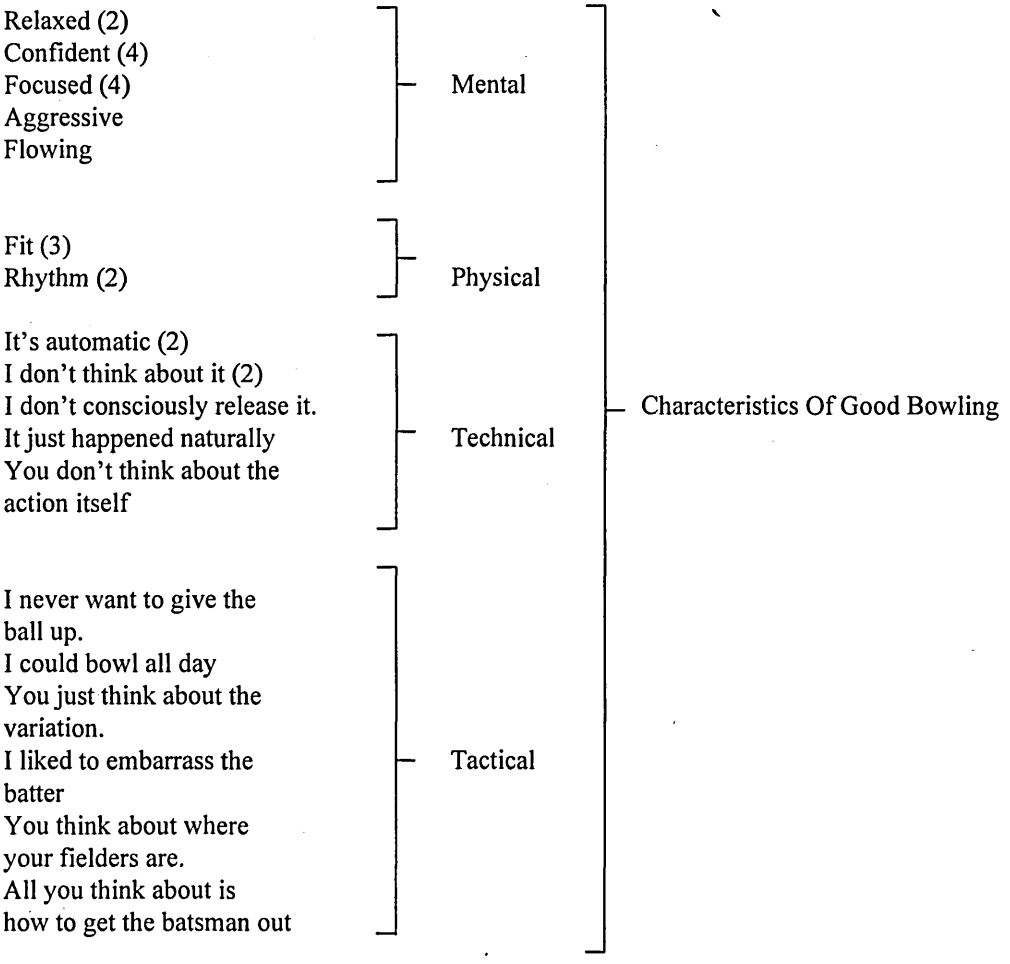


Figure 3.12 - The Difference Between the Yips and Bowling Badly.

Raw data Theme	Higher Order Themes	General Dimension
It's a completely new dimension Bowling like that had never entered my head I have bowled beyond a bad bowlers over. It's completely alien to bowling badly I've never bowled anything like that badly before I had never bowled a ball that had bounced three times before I had never bowled a ball that went over the wicket keepers head before It's a completely different dimension to bowling badly.		The Difference Between The Yips And Bowling Badly

Figure 3.13 - Characteristics of a Good Bowling Performance.



Characteristics of a Good Bowling Performance

This general dimension was made up of four higher order themes from 5 per cent of the raw data themes (see Figure 3.13). The higher order themes were mental, physical, technical and tactical. Throughout the interviews the participants would make reference to how it felt when they were bowling well and how this differed from their experience of the 'yips'. One bowler stated "When I'm bowling well, I don't really think about anything, it just happens". Another commented "when I'm bowling well I'm just focused on how to get the batsman out, I don't focus on me at all".

Personal Characteristics

This general dimension was composed of two higher order themes from 5 per cent of the raw data themes (see Figure 3.14). The two higher order themes were positive personal characteristics and negative personal characteristics. Throughout the interviews the participants made reference to both positive personal characteristics and also negative personal characteristics that they felt could have contributed to their experience of the 'yips'. The most significant finding was that five of the participants perceive themselves to be very confident yet also very self-conscious about themselves. One bowler stated "I am a very self-conscious person, I very much like to look good, to do things well, I like things to go right". Another bowler stated that "I think that it (the 'yips') was some kind of reflection of some sort of insecurity".

Personal Explanations For Why The Yips Were Experienced

This general dimension comprised four higher order themes that were formed from 5 per cent of the raw data themes (see Figure 3.15). The higher order themes were mental, physical, technical and environmental. Since experiencing the 'yips' the bowlers have attempted to explain why they experienced this dramatic decrease in performance. The explanations were wide ranging from not having enough sleep previously to wanting to impress team mates. This point was clearly emphasised by one of the participants who stated "It's the level of importance that you attach to the

Figure 3.14 - Personal Characteristics

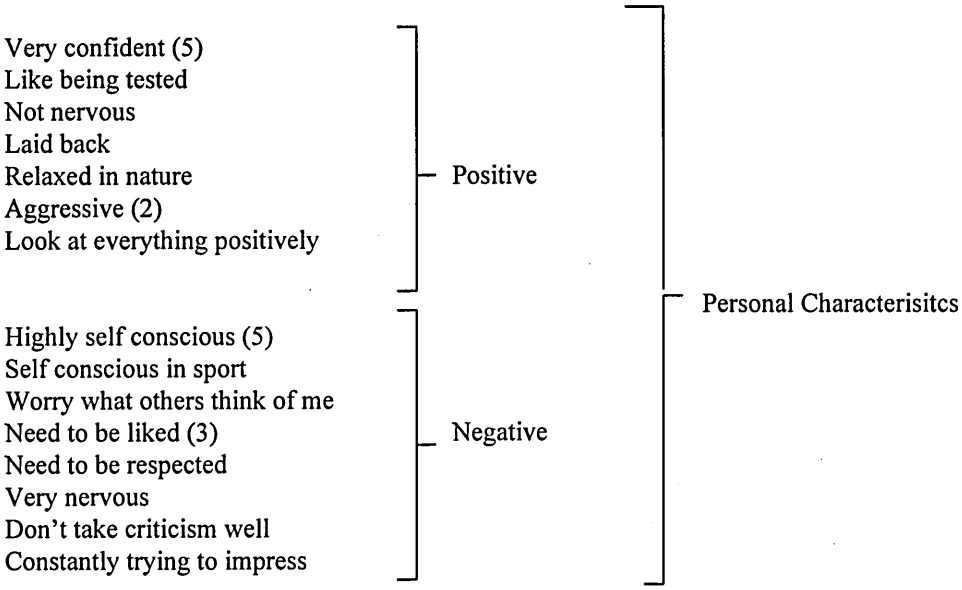
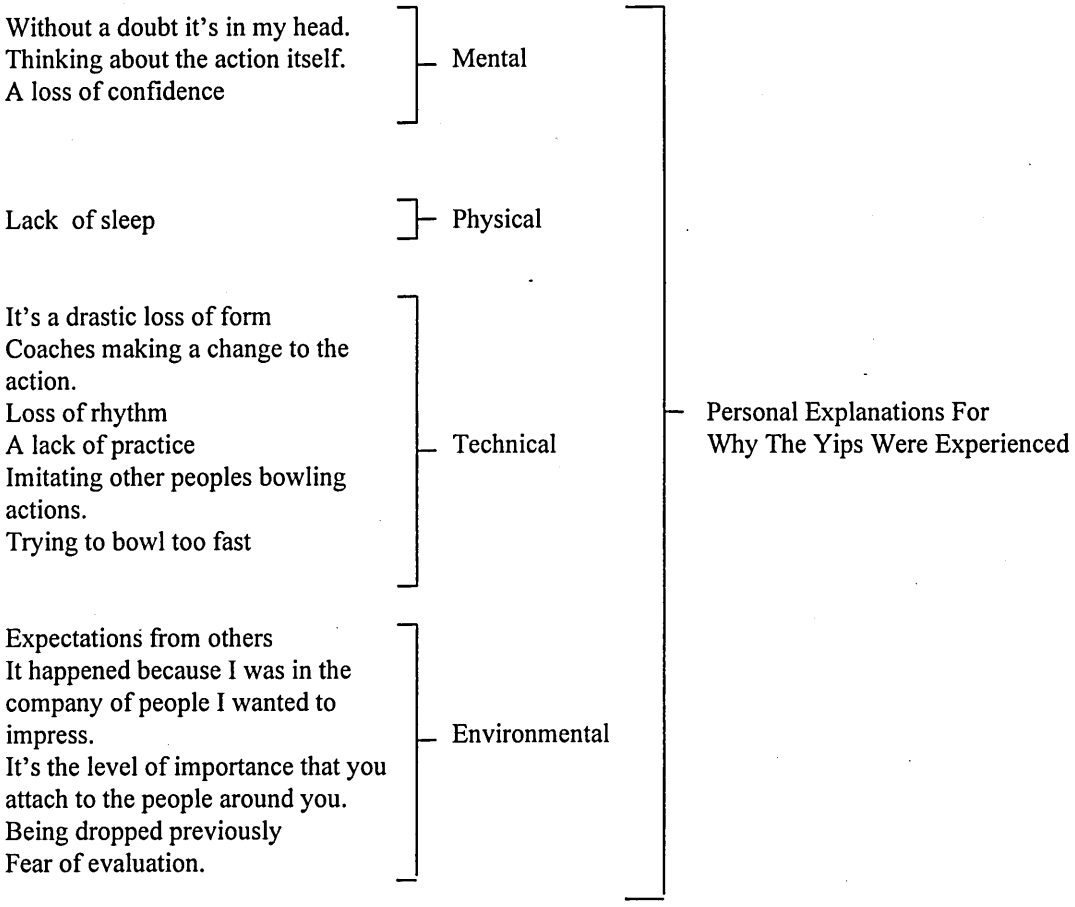


Figure 3.15 - Personal Explanations For Why The Yips Were Experienced.



people around you". All the participants in this study expressed a love for the game and stated that it was a highly important part of their lives. One participant stated "I still love the game, but I feel as if the most important thing in my life has been taken away from me".

3.4. GENERAL DISCUSSION

The major purpose of the study was to identify psychological factors that might contribute to the phenomenon of the 'yips' in cricket bowlers. Interviews were carried out to explore individual perceptions about the initial experience of the 'yips'. Interviews also highlighted individual's thoughts, feelings, emotions and performances subsequent to the initial breakdown in their bowling.

Previous research into the golfing 'yips' has established a number of demographic characteristics of those that suffer from the disorder. McDaniel et al. (1989) found that 'yips' sufferers had a mean age 35.9 years and had experienced a mean of 29.9 years playing experience before the onset of the problem. In a study by Sachdev (1992) the mean age of those with the 'yips' was 54.5 years and the mean age of the onset was 35.1 years. In the Smith et al. (2000) study the mean age of 'yippers' was 45.2 years with an average of 30.3 years playing experience. In the present study the mean age of the participants was 23.4 years with an average of 13.4 years playing experience before the onset of the problem. Clearly the mean age of the cricketers interviewed is much lower than the previous studies in golf. The age of 'yips' sufferers has been one of the main factors which has led researchers to conclude that the problem is an over use injury. However, the age range of 'yips' sufferers in previous studies has ranged from 17 – 81 (Smith et al. 2000). Therefore, as younger performers can experience the problem then the number of years competing would be a more appropriate comparison. In the present study the age of the participants ranged from 18 – 32 years. No firm conclusions can be made from the present research with regards to demographics due to the small sample size involved.

Previous research in golf described the symptoms of the problem as involuntary jerks, tremors and spasms in the wrist and hands (McDaniel et al., 1989). In the present research bowlers described the symptoms as involuntary muscular tension in the hand and a lack of control of the wrist resulting in the perception of not being able to release the ball. Despite the differences in the skills of putting and bowling the physical symptoms appear to have some similarities. The main similarity is the presence of involuntary muscular contractions. Despite the subtle difference between the symptoms of putting and bowling both conditions lead the performers to feel as if they have little control over their actions.

A criterion for the inclusion of participants in previous research has been that the symptoms that are experienced are episodic as these symptoms are consistent with dystonia related problems (Smith et al., 2000). In the present study all eight of the golfers experienced episodic symptoms, for seven of the participants this was related to experiencing stress. Thus, when performing with little stress in practice they could bowl well, yet when experiencing stress they would experience the same physical symptoms. All the participants had been able to regain their performance during match play yet had experienced remissions back to the 'yips'. Before the initial experience of the 'yips' the bowlers had little knowledge that the experience was going to happen. This lack of awareness about the onset of the problem could lead to conclusions that the problem was initially purely dystonia based (McDaniel et al., 1989). However, after the initial experience the bowlers made reference to many psychological phenomena being influential over their performance. The findings from this part of the study would suggest that the bowlers experienced similar symptoms to those established by Smith et al. (2000) in that they experience an interaction between dystonic and anxiety related symptoms.

In previous research a psychological factor that has separated golfers with the 'yips' from those without is obsessional thinking (McDaniel et al., 1989). In the present study obsessional thinking was not made reference to by the participants. However, two characteristics were commented upon which have theoretical links to obsessional thinking. These factors were negative visualisation and self-consciousness. Previous

research into the golfing 'yips' has found that sufferers experience negative thoughts and expectations about future performances. Therefore, when a golfer visualises future putts they can only see negative consequences (McDaniel et al., 1989, Sachdev, 1992). This finding was supported in the present study in cricketers. The participants made reference to being unable to see themselves performing successfully in their 'mind's eye'. Thus, whenever they attempted to visualise bowling they experienced the thoughts, feelings and emotions associated with a 'yipped' delivery. This negative visualisation can be linked to a component called rehearsal which is an aspect of the reinvestment scale (Masters et al., 1993). Rehearsal is a factor originally from the Emotional Control Questionnaire (Roger & Nesshoever, 1987) and is described as the tendency to mentally rehearse emotional events. Masters et al. (1993) has found that individuals who will score highly on the reinvestment scale are more prone to choking. Thus, the participants in this study appear to be prone to negative rehearsal of their 'yips' experience. This visualisation reinforced their negative expectations of future performances. The participants also made reference to being self-conscious and being preoccupied by the thoughts of others. Clearly these two factors can be linked to a disposition towards obsessional thinking.

Throughout the initial experience of the 'yips' the bowlers appear to follow a similar sequence of events to that of the choking process as outlined by Baumeister (1984). This can be seen when looking at the connections between the higher order themes that emerged. The higher order themes of cognitive anxiety, inappropriate focus, increased self-consciousness and conscious control of movement are all experiences reported during the first experience of the 'yips' by the participants. Baumeister (1984) proposed that as anxiety increases so the individual's level of self-consciousness increases and therefore their attention becomes inappropriate for carrying out the task effectively. Factors such as evaluation from others and self-presentational concerns (Leary, 1992) appear to be strong contributing factors to this choking process. As individuals become more self-conscious about their performance through perceived negative evaluation from others, so they attempt to consciously control their movement. This finding supports the conscious processing hypothesis (Masters, 1992). For all participants in this study, the skill of bowling had reached the

autonomous stage of functioning, hence consciousness did not hold this information and thus attempts to consciously control movement had a detrimental effect on performance. It is therefore suggested that the initial process of the 'yips' in bowlers has similar underpinning mechanisms to that of 'choking' as described by Baumeister (1984). However, an issue important to the participants which differentiates the experience from the usual choking phenomenon was that they perceive themselves to be trapped in this choking process and unable to escape from it. This was because the result of a 'choked' delivery was usually an illegal ball (a no ball or wide) which required the bowler to repeat that delivery. Therefore, until the bowler has successfully completed six legal deliveries they cannot finish bowling. This perception of being 'trapped' in the situation appears to be a strong source of the anxiety experienced by the bowlers. As the anxiety increased the participants recalled feelings of 'extreme panic' and described many symptoms that are customarily associated with panic disorders or could be linked to social phobias (Silva, 1994). Such symptoms included personal embarrassment, feeling a loss of control, intense anxiety and excessive concern about social evaluations and comparison (Silva,1994). Silva (1994) stated "The individual may experience acute physical responses and feel physically and psychologically trapped resulting in the possibility of a disabling panic response or unrestrained flight" (p.103).

The 'yips' in bowling appear to share many common characteristics with those described by Silva (1994) as sport performance phobias. When looking at the higher order themes associated with future performance, the dominant perceptions were of a strong fear of failure and also seeing the negative consequences of bowling through visualisation. These perceptions lead to a further higher order theme, that of avoidance, with the dominant thought being that 'I don't want to bowl'. These higher order themes show many similarities to the processes seen in sports performance phobias (Silva, 1994). The sport performance phobias affect simple, routine motor skill tasks and result in an individual experiencing extreme anxiety when they are confronted with the phobic situation. Unlike the experience of 'choking' the sports performance phobia becomes a long-term problem, whereby the individual experiences similar symptoms to their initial experience whenever they return to that

same situation. It can therefore be concluded that the 'yips' share many similar characteristics to simple, social and agoraphobic syndromes (Silva, 1994). These are emphasised when looking at the higher order themes associated with 'reasons for not bowling now'. The higher order themes that emerged from the analysis were feeling a lack of confidence and having strong negative self-presentational concerns about potential future performances. The fact that the skill of bowling is perceived to be a simple task to the participants adds to their fear of failure and, subsequently, thoughts about their credibility as a cricketer decreasing are enough to stop them wanting to bowl. As with individuals who suffer from phobias the participants within this study demonstrated a strong desire to avoid bowling which had resulted in some players no longer wanting to participate in the sport. Thus, it appears that the mechanisms associated with the 'yips' could represent an extreme form of choking (Masters, 1992). However, due to constant reinforcement of this choking process, the symptoms become chronic and show many similarities to those seen in sport performance phobias. Carver and Scheier (1988) proposed a control-process perspective on anxiety which supports the theorising of Silva (1994). This perspective is particularly relevant to the 'yips' as it suggests that anxiety causes an interruption in ongoing self-regulation. This interruption leads to an assessment of outcome or coping expectancies in the situation. Individuals who have favourable expectancies return to the interrupted activity, whereas those with unfavourable expectancies have an impulse to disengage from further performance. If a person returns to the situation again and becomes aware of the same anxiety response then this can reinforce the symptoms and lead to a greater self-focus within the individual. Carver and Scheier (1988) state "Over a period of time, this cycle of doubt, disengagement, reconfrontation and renewed doubt often produces a phenomenology of self-deprecatory rumination under conditions of high anxiety" (p.20).

An important finding from the present investigation was that all the participants felt high levels of self-consciousness whilst performing. Carver and Scheier (1981) suggest that focusing attention towards oneself whilst performing, detracts from important task relevant cues and has a detrimental effect on performance. Hence, distractions in the form of worry, anxiety and self-awareness can contribute to the

'choking' process and have a negative effect on the production of a motor skill. Theoretical explanations to support these factors come from the distraction models of choking (Wine, 1971). However, two dominant characteristics to come from the research were self-consciousness (Fenigstein et al., 1975) and conscious processing (Masters, 1992); these factors are characteristic of the self-awareness models of choking (Baumeister, 1984). Baumeister (1984) concluded from an investigation into 'choking' that individuals who had low levels of dispositional self-consciousness were shown to be more susceptible to 'choking' under pressure than those individuals high in self-consciousness. The findings of the present study conflict with these findings of Baumeister (1984) as five of the participants cited high self-consciousness as a personal characteristic. Clearly the relationship between self-consciousness, choking and the phenomenon of the 'yips' needs to be investigated in more depth.

A further recurrent finding from this study was that each of the participants claimed that when they first experienced the problem, cricket was the most important aspect of their life. The importance that one attaches to the performance is a key characteristic of the 'choking' process (Leary, 1992). One bowler explained how important cricket was to him, "It sounds ridiculous but I still love it, cricket is everything, cricket isn't just about playing on the square, it's about attitude and how you conduct yourself, it's a mirror of life".

The limitations of this study are that it has only focussed on a group of eight bowlers. Previous studies that have investigated the 'yips' have done so through questionnaires and have accessed large numbers of participants. However, it was felt that an in-depth qualitative study could provide a more detailed account and understanding of the 'yips' experience. A further limitation of the study is that it is hard to compare and contrast the findings to other 'yips' studies as no previous research has focused specifically on the bowling 'yips'. Such findings would be able to clearly highlight the differences between a bowler bowling badly and a bowler who is experiencing the 'yips'. The differences highlighted by the participants within this study were that when bowling with the 'yips' the dominant sensation was of not being able to release the ball. This sensation resulted in extreme outcomes, such as the ball bouncing twice. When

bowling badly the participants would simply experience problems with their line and length or have problems finding their natural rhythm. A further major difference between bowling badly and the 'yips' was the long-term nature of the problem.

In conclusion, the findings from this initial qualitative investigation into the 'yips' in cricket bowlers has provided many factors that have potentially influenced the breakdown in their ability to bowl. During the initial experience of the 'yips' it appears that individuals experience many of the characteristics associated with the 'choking' process (Baumeister, 1984). These characteristics include, increased anxiety, increased self-consciousness and increased attempts to consciously control their bowling action. However, due to the nature of bowling, this process becomes more intense as the bowlers feel that they are 'trapped' in the 'choking' process and this subsequently leads to extreme panic. Due to the intensity of this initial experience the bowlers lost confidence in their ability to carry out the skill and therefore tended to try and avoid performing. These actions have many similarities to phobic behaviour (Silva, 1994).

This investigation has provided some insights into the characteristics of the 'yips' experience, yet it has not provided an explanation of how or why the initial experience occurs, when it does. Further research into this phenomenon should attempt to establish whether individuals with particular personality traits might be more prone to the 'yips'. It could be that the 'yips' are initiated with a choking experience, yet some personality types are more prone to making the symptoms chronic rather than a one-off experience. Clearly the relationship between the 'yips' and choking in sports performance needs to be studied in more detail in future studies.

3.5. STUDY 1 (Part 2): ASSESSING INDIVIDUAL PERCEPTIONS OF THE 'YIPS' IN CRICKETERS : AN EXPLORATORY INVESTIGATION USING REPERTORY GRID TECHNIQUE

3.6. INTRODUCTION

To provide further support for the findings established in part one of the first study and develop a deeper understanding of each individual's 'yips' experience, data were also collected by using a Personal Construct perspective (Kelly, 1955). Personal Construct Theory was chosen as a theoretical underpinning to support the inductive analysis primarily owing to its central focus on individual perceptions and their quest to find meaning behind life events (Kelly, 1955). Such a perspective is an idographic measure that can evaluate how each individual perceived and understood their situation. Kelly's (1955) personal construct theory is based on the notion that an individual's behaviour is determined by how he or she understands (construes) their experiences. The routes of the theory were developed from a philosophical position that Kelly (1955) termed constructive alternativism. Kelly (1955) stated:

> "...all our present perceptions are open to question and reconsideration and it does broadly suggest that even the most obvious occurrences of everyday life might appear utterly transformed if we were inventive enough to construe them differently." (p 1-2).

Kelly (1955) suggested that we cannot have an interpretation-free reality. According to Kelly (1955) each individual makes assumptions about their experiences, and then tests these assumptions to establish how useful or useless these assumptions are. Kelly (1955) proposed that individuals create patterns or templates that they attempt to fit over their experiences in the world. Kelly (1955) defined these patterns as constructs. Hence, individuals are continuously testing their own private hypotheses about how they perceive and understand their world.

Kelly (1955) formalised his theory by stating one basic underlining assumption which he termed 'the fundamental postulate'. This stated that "a person's processes are psychologically channellized by the ways in which he anticipates events" (p 46).

The underlying concept behind Kelly's (1955) theory is that an individual is constantly attempting to make sense of the world, and thus they can then attribute meaning to events and situations. Kelly (1955) expanded on his interpretation of personal meaning in a series of eleven corollaries. Each of these corollaries helps to explain and describe how personal constructs are established and developed.

A technique which uses Personal Construct Theory and has been used to understand the perspective of the performer in sporting contexts is the performance profile (Butler, 1996; Butler & Hardy, 1992). This technique encourages the performer to assess the qualities they require and possess to perform in their sport and acts as a tool for self-evaluation. The performance profile was originally applied to sporting contexts by Butler (1989), however, the essence of the theory lies within Kelly's (1955) Personal Construct Theory. Many contemporary researchers have started to use this perspective to gain a greater understanding of sports performers' experiences (Butler & Hardy, 1992; Doyle & Parfitt, 1996; Jones, 1993). Despite the fact that the performance profile has been used in sport settings, Kelly (1955) advocated the use of the repertory grid technique to enable the identification and exploration of an individual's construct system. Through this technique performers are required to draw upon their personal experiences in life and judge the quality of their performances.

To explore an individual's personal construct system, Kelly (1955) developed the repertory grid technique. This technique allows individuals to express themselves in a way that is meaningful to them. The repertory grid technique is a form of structured interview, which is developed from elements and constructs. The elements are typically situations or people and in this investigation the elements were all bowling standards. The constructs were the dimensions used to differentiate between the elements. In the present study the constructs were all feelings, perceptions and

emotions felt whilst bowling. The objective was for each participant to generate appropriate constructs and then rate these across the bowling standards that were provided. Due to the range of bowling performances that the participants had experienced in the present investigation, it was felt that the repertory grid technique could provide further insights into our understanding of the 'yips'.

The primary aim of this investigation was to explore the perceptions of individuals who had experienced the 'yips' in cricket using a personal construct perspective. The rationale for using the repertory grid analysis was that it could establish if there is a core of common constructs for cricketers who have experienced the 'yips'. Repertory grids can also provide a hierarchy of importance to the constructs and thus a common order of perceptions and feelings can be established. This form of analysis was considered to be important in the nature of this thesis as it provides a hierarchical structure to the constructs. The findings from the first part of study one of this thesis have provided many insights into the 'yips', however, due to the large quantity of information to emerge from the inductive analysis it was felt that a priority of constructs would help to focus the future directions of the thesis.

A secondary aim of this study was to compare the constructs established within the repertory grid technique to the general dimensions established from the semi-structured interviews established in part one of this study.

A final aim of this study was to determine to what extent the experience of the 'yips' was different from other standards of bowling in terms of its severity.

3.7. METHOD

Participants

The participants were the same as in Study 1 part 1 (see section 3.2.)

Procedure

Seven elements (standards of bowlers) were selected. The elements were chosen to cover a wide range of experiences and perceptions. They were designed to see how the individuals perceived themselves during the experience of the 'yips', in comparison to a number of other experiences. The seven elements covered various standards of performance, these were: the ideal bowling me, me as a bowler now, a good bowler, me during the experience of the 'yips', me as I used to bowl, an average bowler and me as a person. Each participant was asked to describe their feelings and emotions during the experience of the 'yips'. When a participant provided a construct, the interviewer asked whether they were happy to put this construct onto the grid. If the participant was happy with the construct then they were asked to name what they felt the opposite of that construct to be (e.g. the opposite of 'consciously controlling the bowling action' was 'automatic'). The participant was then asked which of these constructs were perceived as being negative and which were seen as being positive. Automatic was perceived as being positive and thus was placed on the positive side of the grid whereas consciously controlling the bowling action was perceived as negative.

A secondary technique was also used to establish constructs for the grid, this was the triad method. This technique involves showing the participant three of the elements and asking them "In what way are two of these similar, thus making the third one different ?". The number of constructs provided was dependant on the individual, however, they were limited to a maximum of twenty four due to limitations in the analysis software. Once the participant felt that they had provided as many constructs as they felt were relevant, then they were required to rate each construct on a scale 1 (negative) to 7 (positive) based on each element provided. An example of this would be to rate to what extent the participant feels inferior (1) to superior (7) for each of the elements. Therefore, for 'the ideal bowling me' the participant could rate themselves at 7 whereas for 'me as a bowler now' they could rate themselves at 2. Such a grading demonstrated the difference in perception across elements.

Method of Analysis

Each repertory grid was analysed using the Grid Analysis for Beginners (GAB) computer programme (Higginbotham & Bannister, 1983). This programme computes a correlation matrix for all the constructs within each individual grid. The analysis provides a cluster analysis that ranks the constructs in order of importance and also in order of correlation variance (Fransella & Bannister, 1977). In total 114 personal constructs were elicited by the eight participants. Sixteen summary categories were established from the most commonly occurring constructs. These summary categories were developed so that comparisons between participants could be made. All forms of analysis were undertaken in keeping with the methods used by Balsdon and Clift (1990; 1992).

3.8. RESULTS

Results of Individual Grids

The eight grids were subjected to correlational and anchor analysis. For each of the grids very high correlations were established among constructs and the anchor analysis classified dominant constructs into principal components. Table 3.1 provides an example of the grid produced by participant one and shows the raw data that was placed into the GAB computer programme. The grid shows the characteristics that the participant felt were the important feelings and emotions associated with the experience of the 'yips' and the opposite of those constructs. These constructs were then subject to a correlational analysis to establish the inter-relationships of constructs (see Table 3.2). Table 3.2 shows the inter-relationship of the constructs that were produced in the repertory grid. The table shows that the majority of the constructs were very highly related to each other. Such high correlation's are common in repertory grids of this nature.

Table 3.1 - Repertory grid produced by participant one

Elements (perceptions of different performances)							
Constructs							
	Ideal	Now	Good	Yips	Used	Average	Person
1. Rhythm - No rhythm	7	2	7	1	4	5	5
2. Confident - Loss of Belief	7	2	6	1	4	4	5
3. Superior – Inferior	7	2	6	2	4	4	5
4. Controlled - Out of control	7	3	6	2	5	5	6
5. Happy – Disappointed	7	2	6	1	5	6	7
6. Relaxed - Tense	7	3	7	1	5	5	5
7. Automatic – Conscious control	7	3	7	2	5	5	6
8. Comfortable – Uncomfortable	7	3	7	2	5	5	6
9. Positive nerves – Negative nerves	4	2	4	1	4	4	4
10. Enjoyment - No enjoyment	7	4	7	1	6	6	7
11. Positive flow – Negative evaluation from others.	7	2	6	1	4	5	4
12. Not bothered by others – Expectations from others.	7	2	6	2	4	5	4
13. Credibility – Loss of credibility.	6	4	6	1	5	5	5
14. Natural - Un-natural	7	3	6	2	5	5	5

Table 3.2 Construct correlations for participant one

	Constructs	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Rhythm - No rhythm	-	0.98	0.96	0.96	0.92	0.98	0.98	0.98	0.88	0.90	0.98	0.96	0.90	0.97
2	Confident - Loss of Belief		-	0.99	0.98	0.92	0.97	0.99	0.99	0.86	0.91	0.96	0.95	0.89	0.98
3	Superior - Inferior			-	0.96	0.89	0.93	0.97	0.97	0.80	0.84	0.95	0.95	0.81	0.96
4	Controlled - Out of control				-	0.97	0.95	0.98	0.98	0.92	0.95	0.94	0.91	0.91	0.98
5	Happy - Disappointed					-	0.90	0.94	0.94	0.95	0.95	0.89	0.85	0.87	0.92
6	Relaxed – Tense						-	0.98	0.98	0.91	0.94	0.97	0.93	0.96	0.98
7	Automatic – Conscious control							-	1.00	0.90	0.94	0.95	0.92	0.91	0.97
8	Comfortable - Uncomfortable								-	0.90	0.94	0.95	0.92	0.91	0.97
9	Positive nerves Negative nerves									-	0.96	0.86	0.80	0.92	0.90
10	Enjoyment - No enjoyment										-	0.87	0.80	0.97	0.92
11	Positive flow - Negative evaluation											-	0.99	0.89	0.98
12	Not bothered by others-Expectations.												-	0.81	0.96
13	Credibility - Loss of credibility.													-	0.92
14	Natural - Un-natural														-

Categorisation of Personal Constructs

The original 114 constructs elicited by the participants were condensed into 16 categories. This procedure was implemented as many of the individual constructs could be placed under the umbrella of a single more general construct. In order to facilitate this process the participants were required to state what each construct actually meant to them. Such a procedure counteracts interviewer bias when interpreting constructs. Each participant's summary constructs were then ranked as dictated by their order of variance from the GAB analysis. The 16 summary categories and their ranking order (according to variance) for each participant can be seen in Table 3.3. The frequency of summary categories ranked in the top 8 constructs is also included. The frequency of use of each of the summary constructs by all participants can be seen in Table 3.4. Therefore it can be seen from table 3.4 that negative self-perception was the most common construct cited by the participants. Thus, negative self-perception was rated 16 times inside the top 8 constructs to evolve from the anchor analysis. Table 3.4 illustrates that across participants, a number of summary constructs were more dominant than others. The constructs highlighted most frequently in the repertory grids were 'negative self perception', 'no confidence', 'self-consciousness', 'conscious control' and 'physical tension'.

Repertory Grid (Element) Scores

Table 3.5 illustrates the means and standard deviations of the scores obtained for the repertory grids for each individual. Overall means for all participants are also included. This table shows the total mean scores for all constructs in each element. This table highlights the severity of the 'yips' experience in relation to other bowling standards.

Table 3.3 - Summary categories, order of ranking according to variance and frequency of use among the first eight constructs identified by the anchor analysis.

Construct Group	Participants 1	2	3	4	5	6	7	8	Frequency (1-8)
No confidence	1, 5	-	12	4	13	7, 2	7	4, 5, 17, 19	8
Physical tension	6	-		7	8	15	4	3, 11, 20	5
Conscious control	2	1	6	10	3, 6	8	3	10	7
Fear	10		10	3		13	2	12	2
Out of control	4	6	13	1	7	-	-	14	4
Self-conscious	8, 11, 12	9	3	5	2, 5	4	-	15, 18, 21	6
Negative			1, 5	-	-	1, 12	6	1, 9	5
Distracted		11	9	-	-	11	10	2	1
No rhythm	7, 3	4	7	-	-	14	9	13	4
Inferior	-	-	-	6	4	9, 10	1	-	3
Embarrassed	-	5	-	9	-	-	-	24	1
Anxiety	13			2					1
Not wanting to bowl		2			1			16	2
Negative motivation		7, 8			10	2	8		4
Neg. self perception / emotions	9	3	2, 4, 8, 14	8	11, 12	5, 16	5	6, 7, 8, 22	11
Negative tactics		10	11		7			23	1

Table 3.4 - Hierarchy of construct types based on the frequency of use by bowlers.

Frequency of usage by participants	Construct type
16	Negative self-perception.
12	No confidence
12	Self-consciousness
9	Conscious control
8	Physical tension
7	Negative No rhythm
6	Fear Feeling out of control
5	Distracted Inferior Negative motivation Negative tactics
3	Embarrassed Not wanting to bowl
2	Anxiety

Table 3.5 - Means ± standard deviations for the elements (bowling standards) from each repertory grid.

	During	Now	Average	Me	Good	Used	Ideal
Participant 1	1.09 ± 0.30	4.36 ± 0.67	5.18 ± 0.60	5.18 ± 0.87	6.18 ± 0.60	6.55 ± 0.52	6.73 ± 0 .47
Participant 2	1.25 ± 1.22	1.54 ± 1.25	5.17 ± 1.90	5.00 ± 0.87	6.79 ± 0.72	6.71 ± 0.55	7.00 ± 0.00
Participant 3	1.82 ± 1.33	4.82 ± 0.98	3.73 ± 1.27	5.73 ± 1.10	5.82 ± 0.87	6.09 ± 1.22	6.36 ± 1.03
Participant 4	1.21 ± 0.58	2.43 ± 0.85	4.57 ± 0.76	5.43 ± 0.51	5.36 ± 0.84	5.50 ± 0.76	6.71 ± 0 .61
Participant 5	1.62 ± 0.65	4.92 ± 0.49	5.00 ± 0.58	5.08 ± 0.76	6.31 ± 0 .48	5.23 ± 0.44	6.54 ± 0.52
Participant 6	1.44 ± 1.03	1.38 ± 0.62	4.06 ± 0.85	6.00 ± 0.73	6.19 ± 0.54	6.38 ± 0.72	6.44 ± 0.51
Participant 7	1.70 ± 0.95	4.80 ± 1.81	4.40 ± 1.07	5.50 ± 1.43	6.70 ± 0.48	6.70 ± 0.48	7.00 ± 0.00
Participant 8	1.43 ± 0.51	2.71 ± 0.73	4.86 ± 0.52	5.07 ± 0.92	6.21 ± 0.80	4.50 ± 0.52	6.71 ± 0.83
Overall	1.42 ± 0.92	3.04 ± 1.74	4.67 ± 1.22	5.37 ± 0.86	6.21 ± 0.83	5.99 ± 1.00	6.71 ± 0.59

3.9. DISCUSSION

Part two of study one further examined the perceptions of individuals who have experienced the 'yips' in cricket. It was conducted to establish whether the repertory grid technique produced similar constructs to the general dimensions established from the inductive content analysis. Using the repertory grid technique also allowed the experimenter to produce a hierarchy of constructs.

One of the most informative aids to grid interpretation was provided by the analysis of correlations between constructs. All eight of the participants construed their experience of the bowling very similarly as the majority of their constructs were related highly significantly with one another (see Table 3.2 for example grid correlations). This was particularly evident as several of the bowlers produced unidimensional grid outputs (a characteristic of highly significant intercorrelations). This monolithic form of construing was similar to that found by Makhlouf-Norris, Jones & Norris (1970). The authors suggested that individuals prone to obsessional thinking tended to have monolithic structures in which most constructs are interrelated in a single primary cluster, with few isolates. In such outputs there are usually some highly dominant principal constructs that are significantly related to all other constructs. One of the findings from the McDaniel et al. (1989) study was that the difference between golfers with and without the 'yips' was that 'yippers' possessed at least one item related to obsessional thinking. This finding was replicated within the repertory grids produced within this study.

Sixteen summary categories were established from the total number of constructs produced by the eight participants. Of these summary categories the five most commonly cited by participants were negative self-perceptions, having no confidence, feeling highly self-conscious, conscious control and feeling physical tension. These constructs showed very similar characteristics to the most popular general dimensions established in the inductive content analysis. The five most popular general dimensions to emerge from the inductive content analysis were physical responses,

anxiety, conscious control, self-presentational concerns and negative emotions and feelings. Thus, the two forms of analysis produced similar common themes.

The final aim of this study was to examine how the bowlers perceived the 'yips' in comparison to other bowling experiences and standards. The results from this analysis can be seen in Table 3.6. The actual experiences of the bowlers during the 'yips' were clearly the lowest perceived experience (1.42). However, an interesting comparison was between the way the bowlers perceive their bowling now (3.04) to when they were experiencing the 'yips' (1.42). This comparison illustrates a marked increase for the bowlers' overall current perception of themselves. This suggests that the bowlers do feel that their overall perception of themselves as bowlers at this time was more positive than during their experience of the 'yips'. This was an interesting finding as all of the participants perceived themselves to still be affected by the 'yips'. They also stated that they would not feel confident enough to perform in future matches. Hence, it was of importance to see that their overall perceptions of themselves as cricketers had increased.

When comparing the way the bowlers perceive themselves to be now (3.04) with the way they used to be (5.99), a clear difference was apparent. Bowlers perceptions prior to their experience of the 'yips' compared very favourably with their perceptions of what constitutes a good bowler (6.21). However, current perceptions (3.04) were less than their perception of an average bowler (4.67). The participant's perceptions of an ideal bowler were predictably high (6.71). The element of 'me as a person' was included to establish how the bowlers perceived themselves as people outside of the sphere of cricket, this element produced an overall mean score of 5.37. It is important to note that the generalised means were not representative of individual perceptions as they simply show the trends of responses. Hence, it was important to consider the individual mean scores for each participant that are indicated in Table 3.6.

Kelly (1955) proposed that our construct systems are transitional states. He suggested that there are times in an individual's life when the events that they face are not

adequately construed by the constructs that exist. Thus, a bowler will have a number of constructs that they believe represent their experiences of bowling, however when they experience unexpected changes in their ability to perform, then these existing constructs do not explain their behaviour. Kelly (1955) proposed that four main states cause dramatic changes to our construct systems. These states were anxiety, fear, guilt and threat. Kelly (1955) defined anxiety as "the awareness that the events with which a man is confronted lie mostly outside the range of convenience of his construct system." (p.55)

Anxiety as an individual construct was specifically cited by two of the participants. However, a construct cited by six of the eight participants could be described as an extreme form of the anxiety response, notably fear. Kelly (1955) suggested that when part of our world becomes meaningless or unpredictable we experience fear. A major theme from the inductive content analysis was that the bowlers felt out of control because they didn't have influence over their actions. Such an experience led to increased anxiety, panic or fear and ultimately personal threat. The 'yips' were perceived by the bowlers to be an extreme experience and something that, previous to its onset, that they could not imagine happening. Thus, the experience was something that was seen as being highly unpredictable and subsequently threatened their understanding of their bowling experiences. This perception of unpredictability resulted in a severe decrease in their belief of their ability to perform the skill. None of the participants has been able to overcome this factor and this was highlighted in the summary categories as being the second most dominant perception.

The repertory grids and the inductive content analysis completed in study one have identified many similar characteristics within the 'yips' experience. The repertory grids have also specified which of these characteristics were perceived to be the most important to the individuals throughout their experiences. The constructs of self-consciousness and conscious control are two components that are characteristic of Baumeisters (1984) model of choking. The interrelationship between these two constructs will be examined in future studies within this thesis.

3.10. AUTHORS NOTE

The initial aim within this thesis was to explore the 'yips' in bowlers in cricket (Moody, 1993). The rationale for looking specifically at the 'yips' in cricketers was that no previous academic research has focused on the 'yips' in this sport. All previous research investigating the 'yips' had focussed on putting in golf (Cook, 1993; McDaniel et al. 1989; Sachdev, 1992; Smith et al. 2000). Hence, the initial studies in this thesis attempted to examine the personal experiences of the 'yips' in cricket bowlers. However, in order to test some of the psychological characteristics established from study one a series of group-based designs were required and after considerable pilot testing it was established that measuring cricket bowling performance was proving to be problematic. One of the major issues when testing bowling in cricket was how to measure performance outcomes. It became apparent that having very clear dependant variables was a necessity to make firm conclusions from the future research studies. In bowling there are too many interacting variables to establish transparent dependant measures. An example of this was the fact that many bowlers would make deliveries that they considered to be good, however, they would not be successful in hitting the wickets. Therefore, successful performance proved to be subjective rather than outcome-based. In an attempt to develop a standardised objective measure of performance a quantifiable scoring criteria was developed. Thus, each ball was given a score by a series of independent assessors. The team of evaluators included the participant, a bowling coach and the experimenter. However, poor inter-rater reliability ($r = 0.40$) suggested that more stringent dependant variables were required.

Hence, it was concluded that a task that had very clear outcomes had to be included in future group-based designs. The task that adheres most closely to these requirements was golf putting. Many previous research studies have used this task due to its unambiguous outcome measure (e.g. a successful putt is holed), also a series of validated protocols have been established (Hardy et al. 1996b; Masters, 1992; Mullen & Hardy, 2000). The task is also affected by the 'yips' (Cook, 1993; McDaniel et al. 1989; Sachdev, 1992; Smith et al. 2000) and has been used to measure choking in

previous research (Crews, 2001; Lewis & Linder, 1997; Masters, 1992). Due to the similarities in findings between the initial studies of this thesis and those that have investigated the 'yips', and choking (in golf) it was felt that the change of task was justified. Thus, the remaining studies in this thesis used golf-putting as the central task.

CHAPTER 4

4.0. STUDY 2: DISPOSITIONAL SELF-CONSCIOUSNESS, CONSCIOUS PROCESSING AND GOLF-PUTTING PERFORMANCE

4.1. INTRODUCTION

The initial investigations in this thesis have established a number of key characteristics related to the experience of the 'yips' in cricket. Two such characteristics that were seen to be highly influential over performance were self-consciousness and conscious control of movement. Throughout their experience of bowling with the 'yips' bowlers reported feeling highly self-conscious about their performance and the manner in which they were being evaluated as individuals, as well as cricketers. This type of self-focus was perceived to be disruptive to their bowling performance. The participants also claimed that high self-consciousness was a personality trait that was felt to be a detrimental aspect of their character.

Participants also reported attempting to consciously control their bowling actions throughout their experience. This need to try and reinvest control over their bowling was due to feeling a lack of control over the action. Thus, their faith in the automaticity of the skill had diminished. Reinvestment of controlled processing resulted in individuals questioning how they actually bowled a ball. This conscious thought whilst performing the skill resulted in extreme consequences, such as not releasing the ball at all, or making it bounce several times. These negative consequences increased the anxiety being experienced by the bowlers and thus made them more self-conscious about their performance.

The characteristics of self-consciousness and conscious control of movement are felt to be two interactive factors that underpin the choking process (Baumeister, 1984). Baumeister (1984) proposed a model of choking in co-ordination tasks. This model proposed that individuals who experience anxiety become more aware of themselves and this self-awareness leads to attempts to consciously control movement. Baumeister (1984) stated that when an individual experiences pressure they attempt to ensure the correctness of the motor skill by consciously controlling their pattern of

movements. Such a conscious form of movement control was proposed to disrupt the natural production of a motor skill.

Baumeister (1984) investigated how directing an individual's attention to the process of a task affected their performance. Within this study participants were divided into high and low self-conscious individuals using the self-consciousness scale (Fenigstein et al.,1975). Baumeister (1984) hypothesised that low self-conscious participants who were habitually unaware of their internal states would be especially vulnerable to conscious awareness of movement. Baumeister's (1984) results supported the hypothesis as low self-conscious individuals experienced a significant deterioration in their performance. These findings led Baumeister (1984) to conclude that low self-conscious individuals were more prone to choking effects than those high in self-consciousness.

A finding from the first study of this thesis suggested that individuals who had experienced the 'yips' in cricket perceived themselves to be high in dispositional self-consciousness. Thus, it would be appropriate to establish if the first stage of Baumeister's (1984) choking model was applicable to more complex motor skills such as putting in golf.

The aim of this study was to determine whether focusing on the processes of skill execution deteriorates the performance of that skill. The task chosen within this investigation were golf-putts of three and four foot. These distances were identified by McDaniel et al. (1989) as the distances in golf-putting in which the 'yips' usually occur. A further aim of this study was to establish whether individuals who are high or low in dispositional self-consciousness experienced greater debilitative effects when consciously controlling their putting action.

A practical assessment questionnaire was also included in this study to establish participant's perceptions of their experiences throughout the study.

The hypotheses for this study were based on Baumeister's (1984) model of choking. It was proposed that individuals low in dispositional self-consciousness were less self-aware and therefore wouldn't reinvest in controlled processing so readily as those high in self-consciousness. Thus, when individuals were instructed to consciously control movement it was expected to be more detrimental for those who were low in dispositional self-consciousness. Based on this theoretical perspective the following hypotheses were established.

H_1 : Performance in the conscious control condition will be significantly worse than in the 'do your best condition'.

H_2 : Individuals low in dispositional self-consciousness will experience a significantly lower performance score in the conscious control condition than in a 'do your best condition'.

H_3 : Individuals high in dispositional self-consciousness will not experience a significant difference between the conscious control condition and the 'do your best condition'.

H_4 : Individuals low in dispositional self-consciousness will perform significantly poorer than those high in self-consciousness in the conscious control of movement condition.

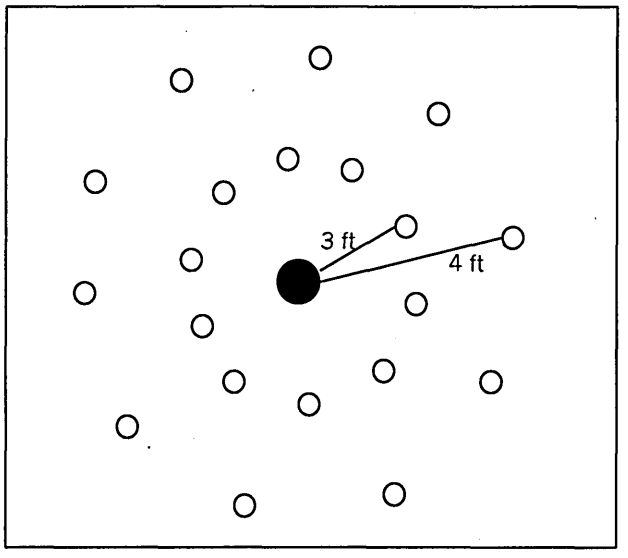
Participants

Twenty four male golfers from Chichester Institute of Higher Education (mean ± standard deviation: age = 23.3 ± 3.33 years) with handicaps of less than 18 (14.5 ± 3.6) and golfing experience (5.96 ± 3.11 years) took part in the investigation. All participants were initially divided into high and low self-conscious individuals as determined by the self-consciousness scale (Fenigstein et al., 1975). Initially 64 golfers completed the questionnaire. Based on their scores from this inventory, participants with a total score of 50 or above, were placed into the high self-conscious group (mean score = 54.0). Participants with a score of 40 or less were placed into the low self-conscious group (mean score = 31.0). Golfers who produced a score between 40 and 50 on the self-consciousness scale were not considered to be either significantly high or low enough in self-consciousness to be put into either experimental group. The handicap of 18 and below was chosen as this was considered to represent a golfer who regularly participated in the sport and had reached a good standard. All of the participants were ensured that the results of this investigation would be confidential. The participants all provided written informed consent before participating in the study.

Apparatus

The experiment was performed on a practice golf-putting green. A real putting green was used to enhance ecological validity, hence the participants had to assess the lie for each putt. Twenty standardised white golf balls, standard size (4.27 cm in diameter) were used. Participants were required to putt into a standard sized golf hole (10.8 cm in diameter). All participants used their own golf-putter throughout the experiment. Balls were arranged around the hole at 3 and 4 feet distances (see Figure 4.1 for experimental protocol).

Figure 4.1 - The experimental set up



Self-consciousness Measure

Self-consciousness was measured by the Self-consciousness Scale (Fenigstein et al., 1975) (see Appendix 5). The scale consists of 23 items, each item is rated on a scale of 0 (extremely characteristic) to 4 (extremely uncharacteristic). The three subscales of the questionnaire were private self-consciousness, public self-consciousness and social anxiety. The private self-consciousness subscale measures an individual's awareness of their level of self-focus. Examples of private self-consciousness items included: 'I'm always trying to figure myself out' and 'I'm generally attentive to my inner feelings'. The public self-consciousness subscale measures an individual's awareness of the publicly displayed aspect of self. Examples of public self-consciousness included: 'I'm concerned about the way I present myself' and 'I'm usually aware of my appearance'. The social anxiety component represented a person's reaction to being focused on by others. Examples of these items include : 'I have trouble working when someone is watching me' or 'I feel anxious when I speak in front of a group'. The test-retest correlations for the three subscales produced a mean R value of 0.80 (range between 0.73 and 0.84),Vincent (1999) states that in the behavioural sciences that values between (0.70 – 0.80) are acceptable.

Procedure

All participants were informed that the experiment was to investigate golf-putting technique. The experiment had three condition: a familiarisation condition, a do your best condition and a conscious control condition. In the initial phase each participant putted 40 balls to familiarise themselves with the task. Initially the participants were divided into high (above a score of 50 on the SCS) and low (below a score of 40 on the SCS) self-conscious individuals (Fenigstein et al., 1975) (see Table 4.1). This scoring criteria was set due to previous pilot work in which the upper quartile were scores above 49.8 and the lower quartile were scores below 40.2. Six high and six low self-conscious individuals were then placed into each experimental group. Thus, two experimental groups of twelve were established with six high and six low self-conscious individuals in each. Group 1 began in the 'Do Your Best' condition and group 2 started in the 'Conscious Control of Movement' condition. Thus, the

experiment was a counter-balanced cross-over design. After completion of the first experimental condition each participant was given 20 minutes rest before completing the second experimental condition. Before each condition each participant was informed about the requirements of the task. In the 'DoYour Best' condition participants were simply informed to putt as many balls as they could. An experimenter was present to record the number of successful putts completed. In the 'Conscious Control of Movement' condition the participants were asked to think about three key process goals before each stroke. These goals were i) how far they needed to move the club in the backswing, ii) how hard each ball needed to be struck and iii) how far their putter needed to follow through. To keep these process goals in the participants mind they were required to play a practice stroke before each putt. During this practice putt they were required to focus on the three process goals. In each condition participants made 40 putts. The dependant variable was the number of successful putts in each condition. No time constraints were imposed on the participants throughout the experiment. After each participant had completed the task they were given a practical assessment questionnaire to complete.

Practical Assessment

To evaluate the internal experience of each participant a practical assessment questionnaire was administered at the completion of each testing session (see Appendix 6). The questionnaire was adapted from Kazdin (1992) and also included social validation questions (Hrycaiko & Martin, 1996). The questionnaire was administered in order to assess each participant's thoughts, feeling and emotions throughout the testing. The participants were asked the following questions: 'What were you thinking during your golfing performance ?', 'What were your feelings during your golfing performance ?', 'What were your emotions during your golfing performance ?', 'Can you highlight how the conditions affected your putting performance ?', Did you use the process goals ?, 'Did you perceive the golf task to be important' and 'Were the procedures of the testing acceptable ?'.

Quantitative Data Analysis

The analysis sought to identify the relationship between dispositional self-consciousness and the conscious control of movement in golf-putting. To examine this relationship a 2 (condition) x 2 (self-consciousness) Analysis of Variance (ANOVA) with one repeated measure for condition was conducted. Mauchly sphericity tests were conducted on the data used in the ANOVA to ensure the assumption of sphericity was not violated in any of the analyses. Shapiro-Wilks tests were carried out to ensure that the data were normally distributed ($p>0.05$). The level of measurement used within this analysis is applicable for the use of ANOVA (Howell, 1992).

4.3. RESULTS

Quantitative Data

Self-consciousness Scale. The scores for all participants on the S-CS can be seen in Table 5.1.

Analysis of Performance Scores. A two-way analysis of variance (ANOVA) for self-consciousness (high or low) and repeated measures for condition (conscious control or do your best) was completed (see Table 4.2 for means). No significant condition by self-consciousness interaction was found ($F_{1,11} = 1.03$ $p = 0.32$) (see Figure 4.2). The analysis produced a main effect for condition ($F_{1,11} = 34.23$ $p < .05$). This result supported hypothesis one. A significant main effect was not found for self-consciousness ($F_{1,11} = 0.873$ $p = 0.36$). As there was no significant interaction effect hypothesis three can also be supported. As there was a main effect for condition the results established that performance scores in the conscious control condition decreased significantly as compared to the 'do your best' condition. The results fail to support hypotheses two and four which were based on Baumeister's (1984) theory of choking.

Table 4.1 - Means ± Standard Deviations for the Self-consciousness Scales

	Total Self-consciousness Score	Private Self-consciousness Score	Public Self-consciousness Score	Social Anxiety Score
High Self-consciousness	56.4 ± 6.35	23.6 ± 3.72	18.7 ± 2.50	14.2 ± 2.52
Low Self-consciousness	35.3 ± 5.77	12.7 ± 2.21	12.3 ± 3.8	10.3 ± 5.2

Figure 4.2 – Performance Scores for High and Low Self-conscious Golfers in 'Do Your Best' and 'Conscious Control' Conditions

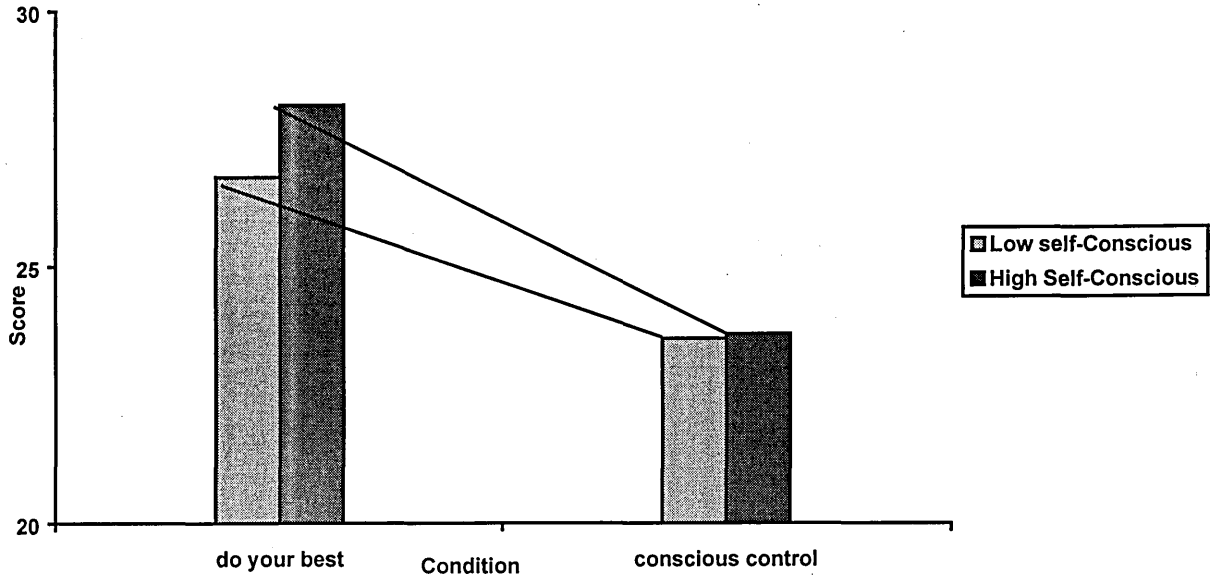


Table 4.2. Means and Standard Deviations for Putting Performance

	Do Your Best		Conscious Control of Movement	
Level of Self-consciousness	M	SD	M	SD
Low Self-conscious	26.8	3.53	23.6	2.68
High Self-conscious	28.2	2.89	23.7	1.97

Practical Assessment Data

The questionnaires were primarily concerned with each participant's perceptions of their experience in the conscious control of movement condition and how this focus of attention influenced their performance.

High Self-conscious Individuals. The three common areas established from the questionnaires were negative thoughts, physical sensations and technical issues. The most common responses with regards to negative thoughts were concerned with thinking too much about the stroke itself and also thinking negatively. One of the participants commented "I was thinking about my stroke so much that I was no longer focused on getting the ball in the hole" another stated "if you think about things too much then doubts start going through your head".

With regards to physical sensations, all of the high self-conscious golfers stated that it felt unnatural or broke their natural putting routine. One golfer stated "It made my stroke feel very mechanical and more tense".

The golfers responses were predominantly related to technical changes that they experienced. One golfer stated "usually I wouldn't be aware of how far I need to bring the putter back or how hard I need to strike the ball, once I started thinking about these things then things started to go wrong with my technique". All the golfers stated that they perceived the golf task to be important and that they had attempted to use the process goals.

Low Self-conscious Individuals. Three common themes also emerged from the questionnaires. These themes were mental negative, mental positive and technical issues. Interestingly the low self-conscious golfers saw the process goals as both a positive and a negative influence on performance. Negative thoughts included "Having the goals makes you question what you are doing, this makes you doubt your ability to make the putt". Another golfer stated "Having the goals disrupted my general approach to each putt". Two of the golfers made reference to the positive

effects of the process goals on their ability to keep focused on the task. One participant commented "The process goals helped me to concentrate more than I would have usually". Another golfer stated "I felt that the goals helped me because they kept me focused".

Technical issues were commented on by both high and low self-conscious golfers. It was felt that the process goals disrupted the natural flow of the golfer's stroke and thus effected their technique negatively. One golfer commented "I don't usually think about it too much I just go on my instincts...thinking about it seemed to disrupt my technique". Three golfers made reference to their usual putting routines "I just look at the distance, then I look at the line and then I hit it , I don't try and think about it too much because then you start to have doubts". Another stated "I never think about how to putt, it's just natural". All the golfers stated that they perceived the golf task to be important and that they had attempted to use the process goals.

4.4. DISCUSSION

The results from the performance outcome data suggested that encouraging individuals to focus on the process of putting was detrimental to performance. This result supports hypothesis one. This finding provides support for the work of Baumeister (1984), Keele (1973) and Kimble and Perlmuter (1970). The results support hypothesis two as individuals low in self-consciousness did experience a significantly lower performance score in the conscious control condition. However, as no interaction effect was found, it cannot be concluded that the low self-conscious groups performance decreased more significantly than the high self-conscious group. As individuals who were high in self-consciousness did not experience significant decreases in performance during the conscious control condition, these results support hypothesis three. Finally, there was no significant difference in performance scores in the conscious control condition between the two self-conscious groups, thus these results also fail to support hypothesis four.

Within the present investigation both the high and low self-conscious golfers experienced a decrease in performance in the conscious control condition as compared to a 'do your best condition'. Thus, the high self-conscious golfers' performance also deteriorated significantly. These findings were contradictory with those of Baumeister (1984). Baumeister (1984) concluded that low self-conscious individuals were more likely to experience performance decrements whilst attentionally focussed in this way because they are usually less aware of themselves when they perform. Subsequently, when a low self-conscious individual is required to become self-aware, the effects of this will be more detrimental than those individuals who are used to performing whilst being self-aware.

The findings did however support the contention of Kimble and Perlmuter (1970) who proposed that automatic behaviour can be destroyed when attention is focused towards it. The authors stated "the act of paying attention to such performances or describing the steps as they occur tends to destroy the automaticity of such behaviour" (p.375).

Langer and Imber (1979) hypothesised that over-learning a skill leads to mindlessness and thus the components of a task become inaccessible to the individual. Therefore, when an expert attempts to consciously control their behaviour it will have a negative effect on their performance. Hence, results from the present study support the work of Langer and Imber (1979) in that automatic behaviour was significantly disrupted when attempts to control the components of the task were introduced. A theoretical difference between the findings from the present study and the theorising of Langer and Imber (1979) is that in the present study the golfers were given explicit rules to follow, whereas Langer and Imber (1979) proposed that performance decreases due to a lack of awareness of explicit rules.

More direct support for these findings comes from the work of Masters (1992) who found that participants who learnt a golf-putting task with explicit rules were more likely to experience skill failure under pressure than those who learn with implicit knowledge. These findings have been supported by Hardy et al. (1996b). In the

present study the participants were instructed to use explicit knowledge when performing and this resulted in a significant decrease in performance. Further support for the conscious processing of automatic skills being detrimental to performance comes from Deikman (1969), Keele (1979), Klatzky (1984) and Singer, Lidor and Cauraugh (1994).

Theoretical explanations for the break down of automatic skills through conscious control include Henry and Roger's 'memory drum' theory (1960). This theory of neuromotor co-ordination predicts that efforts to consciously control automatic skills cause poor co-ordination and thus a breakdown in performance. Such a reinvestment of explicit knowledge has been likened to 'undoing automatization' and has been termed 'deautomatization' (Deikman, 1969).

The practical assessment data provided some personal explanations as to how the participants felt that the conscious control condition disrupted their performance. The majority of the golfers stated that they felt that the conscious control condition felt unnatural, disruptive and resulted in them thinking too much about stroke execution. The major difference between the two groups in terms of their perceptions was that some of the low self-conscious golfers perceived the process goals to help them concentrate throughout the testing. This finding could be attributed to low self-conscious golfers being less motivated to perform well in the testing, because they are less conscious of being evaluated by others.

The findings from the present study could have important practical implications for sport psychologists. Many practitioners advocate the use of process goals as methods to stay focussed during performance (Kingston & Hardy, 1994). However, focussing on the processes of performance could result in the reinvestment of explicit knowledge to control movements and result in a breakdown of automatic processing. Support for this theoretical perspective comes from Cohn (1991) who interviewed a sample of elite golfers, which included touring professionals, club professionals and successful collegiate players. All the participants reported that when they were performing at their best, their golf strokes were effortless and automatic, requiring

little if any conscious thought to control their movements. Based on these findings it can be argued that the use of holistic process goals (Kingston & Hardy, 1994) which focus on the global aspects of performance could be more beneficial to performers. This type of goal encourages automaticity rather than breaking down the skill into its component parts. Further implications for practitioners would be to establish the benefits of process and holistic goals and task specificity. Hence, process holistic goals could be more beneficial in closed skills such as golf putting, whereas process goals may be more beneficial in open skills.

The initial investigation within this thesis found that individuals who have experienced the 'yips' in cricket perceived themselves to be high in self-consciousness. A further finding from that investigation was that a contributing factor to the 'yips' experience was the reinvestment of controlled processes over automatic behaviour. The 'yips' has been considered to be an extreme form of choking (Masters, 1992) and thus it could be hypothesised that high self-conscious individuals would be more prone to extreme forms of choking. A possible cause for this conscious control of movement is stress (Masters, 1992). Baumeister (1984) proposed that heightened perceptions of stress result in greater self-awareness and, thus, conscious control of movement. In the present study individuals were instructed to consciously control their movements and subsequently their performance deteriorated. Therefore, to test Baumeister's (1984) model of choking more specifically, it would be important to include a stress variable. This is because by introducing such a factor it may be possible to establish how stress influences performance and whether this will lead to greater choking responses in high or low self-conscious individuals.

CHAPTER 5

5.0. STUDY 3. DISPOSITIONAL SELF-CONSCIOUSNESS, MANIPULATED STRESS AND GOLF PUTTING PERFORMANCE

5.1. INTRODUCTION

The findings from study two indicated support for the prediction that attention to the process of skill acquisition has detrimental effects on performance outcome (Hardy et al., 1996b; Keele, 1973; Klatzky, 1984; Langer & Imber, 1979; Masters, 1992). Further findings of the previous study established that such a focus disrupts the natural automaticity of the skill. Such results supported a component part of Baumeister's (1984) choking model. However, a further outcome from the previous study was that individuals high in self-consciousness were just as vulnerable to such a focus. This finding failed to support the personality traits associated with Baumeister's (1984) model of choking. This model proposed that individuals low in self-consciousness would experience greater performance decrements when focusing attention towards the process of a skill. To create such a focus of attention Baumeister (1984) suggested that pressure creates anxiety, this then causes self-awareness which leads to conscious control of movement. As low self-conscious individuals do not reflect on their internal processes as readily as those high in self-consciousness, it was proposed that low self-conscious individuals would be more vulnerable to the influence of pressure and ultimately to choking effects.

The initial study of this thesis provided some evidence to suggest that individuals who have experienced the 'yips' in cricket perceive themselves to be high in self-consciousness. The previous study included two components that were established as being important aspects of the 'yips' experience as determined by the initial study. The first of these was a dispositional trait, that of self-consciousness, and the second was a characteristic of the experience, that of conscious control. Thus, the present study included a third important characteristic of the 'yips' experience as established from the initial study, namely that of stress.

Within the sport psychology literature, research into the effects of choking in high and low self-conscious individuals has been relatively scarce. The work of Baumeister (1984) has provided some evidence to support the contention that low self-conscious individuals are more likely to choke than high self-conscious individuals. However, these results must be treated with caution as the task that was used for these experiments was a novel one and thus ego-involvement would not have been a factor. Secondly, the task that was used within the study was not developed to an automatic level of functioning and hence the breakdown of automaticity could not be inferred from the results. The task used was also a simple co-ordination task and thus was very different to the complex nature of a closed skill such as a golf-putt. Finally, throughout the Baumeister (1984) studies anxiety was not measured prior to the experimental conditions. Therefore, conclusions related to increased anxiety could not be inferred.

The purpose of study 3 was to examine the effects of manipulated stress on experienced golfers who are dispositionally high or low in self-consciousness. The experiment also sought to establish the anxiety responses of the high and low self-conscious individuals prior to both a stress and a no-stress condition.

Practical assessment questionnaires were again administered at the completion of the testing to establish individual perceptions about their experiences throughout the experiment. The following hypotheses were based on Baumeister's (1984) model of choking.

H_1 : Golfers low in self-consciousness will experience a significant decrease in performance from the stress to the no stress condition.

H_2 : Golfers high in self-consciousness will experience no significant decrease in performance in the stress condition.

H_3 : Golfers low in self-consciousness will experience a more significant decrease in performance in the stress condition than high self-conscious golfers.

A further aim of this study was to establish whether high and low self-conscious individuals differ in their anxiety responses prior to the experimental conditions as determined by the Anxiety Rating Scale (ARS) (Cox, Russell & Robb, 1995).

5.2. METHOD

Participants

Twenty-four golfers (24 males, mean ± standard deviation: age = 22.3 ± 3.0 years) from Chichester golf club, with handicaps of less than 18 (14.50 ± 3.61) and long term golfing experience (6.25 ± 2.94 years) participated in the investigation. All participants were initially divided into high and low self-conscious individuals as determined by the self-consciousness scale (Fenigstein et al., 1975). Initially 52 golfers completed the questionnaire. The high and low self-conscious golfers were classified using the same mean scores as established in study two (see study 2). The participants all provided written informed consent before participating in the study.

Protocol

The experiment was performed on a grass practice putting green. A real putting green was used to enhance ecological validity, hence the participants had to assess the lie for each putt. Twenty standardised white golf balls of standard size (4.27 cm in diameter) were used. A standard hole 10.8 cm in diameter was used throughout the experiment. All participants used their own golf-putter throughout. The balls were arranged at distances of three and four feet around the hole. The balls were positioned in the same manner as in study 2 (see Figure 5.1).

Measures

Self-consciousness. This was measured by the Self-consciousness Scale (SC-S) (Fenigstein et al., 1975). The scale consists of 23 items, each item is rated on a scale of 0 (extremely characteristic) to 4 (extremely uncharacteristic). The

questionnaire has three subscales of self-consciousness these are explained in detail in the method section of study two (see Table 5.1).

Competitive Anxiety. A condensed form of the Competitive State Anxiety Inventory -2 (CSAI-2) (Martens et al., 1990) was used throughout the study. The Anxiety Rating Scale (ARS) (Cox et al., 1995) (see Appendix 7) consists of three statements that are measured on a likert scale. Each question relates to the subscales of the original CSAI-2. The three statements are: 'I feel nervous, my body feels tight and/or my stomach tense', this statement is linked to somatic anxiety. The second statement was 'I feel concerned about performing poorly and that others will be disappointed with my performance', this statement is linked to cognitive anxiety. The third statement was linked to self-confidence, 'I feel secure, mentally relaxed, and confident of coming through under pressure'. Each response was scored on a seven point likert scale (1 = not at all, - 7 = intensely so). Each of the three ARS subscales were positively correlated with the three subscales of the CSAI-2, cognitive anxiety (0.60), somatic anxiety (0.72) and self-confidence (0.59). The psychometric details were provided after administering the questionnaire to 492 participants. The sample means and standard deviations were 2.54 ± 1.42 for cognitive anxiety, 2.11 ± 1.23 for somatic anxiety and 4.79 ± 1.58 for self-confidence. The ARS (Cox et al., 1995) was administered before each experimental condition after the participant had been briefed about the task.

Procedure

The experiment had three conditions. The first phase involved the familiarisation condition. In this phase all participants were required to make 40 putts to allow them to adjust to the experimental conditions (e.g. the speed of the putting green). Before each experimental condition each participant was informed about the requirements of the task and was required to complete a copy of the ARS (Cox et al., 1995).

In the no-stress condition participants were informed to putt as many balls as they could. An experimenter recorded the number of successful putts made. In each

condition participants made 40 putts. The dependant variable was the number of successful putts per condition. No time constraints were imposed on the participants throughout the experiment. In the stress condition a video camera and a confederate golf professional were present. Directly prior to the testing phase the participant was introduced to the confederate golf professional and told that he would be evaluating their performance. The confederate golf professional was dressed in appropriate golf clothing to increase authenticity and carried a clip board on which he made notes throughout the testing. In reality the confederate simply collected data related to the number of successful putts made by the participants yet they were seen to make other notes throughout the condition. The golf professional stood behind the participants when putting, this was to ensure that he did not visually influence the putting performance, yet the participants were aware of his presence. The participants were also told that this set of 40 putts were going to be filmed for further analysis of technique following the experiment. A scoring system was introduced as a third stress manipulation. The criteria for the system was that whenever a ball was putted the golfer received one point and whenever they missed a putt, one point was deducted from their score. Participants were told that their final score would be placed into a ranked table with all the other participants taking part in the study. This final ranking table was to be sent to each of the participants.

Practical Assessment

In order to evaluate the internal experience of each participant a practical assessment questionnaire was administered at the completion of each testing session. The questionnaire was adapted from Kazdin (1992) and also included social validation questions (Hrycaiko & Martin, 1996). The questionnaire was administered in order to assess each participant's thoughts, feeling and emotions throughout both testing conditions. The participants were asked the following questions: 'What were you thinking during your golfing performance ?', 'What were your feelings during your golfing performance ?', 'What were your emotions during your golfing performance ?', 'Can you highlight how the conditions affected your putting performance ?', 'Did

you perceive the golf task to be important' and 'Were the procedures of the testing acceptable ?'.

Data Analysis

In order to examine the effect of stress on golf-putting performance in high and low self-conscious golfers a 2 (condition) x 2 (self-consciousness) Analysis of Variance (ANOVA) with one repeated measure for condition was conducted. Separate analysis of variance were also conducted on each component of the ARS. Mauchly sphericity tests were conducted on the data used in each of the ANOVA to ensure the assumption of sphericity was not violated in any of the analyses. Shapiro-Wilks tests were carried out to ensure that the data were normally distributed ($p>0.05$). The level of measurement (ratio data) used within this analysis is applicable for the use of ANOVA (Howell, 1992).

5.3. RESULTS

Quantitative Data

Self-consciousness Scale. The results from the S-CS can be seen in Table 5.1.

Analysis of Performance Scores. A two way analysis of variance (ANOVA) for self-consciousness (high or low) with repeated measures for condition (stress or no-stress) was carried out. A significant condition by self-consciousness interaction was found ($F_{1,11} = 4.88$, $p < 0.05$) (see Table 5.2 and Figure 5.1). Subsequent paired *t*- tests (Roberts & Russo, 1999) established that both high self-conscious ($t = 6.4$, $p < 0.5$) and low self-conscious golfers ($t = 3.5$, $p < 0.5$) performance decreased significantly in the stress condition. Paired *t*- tests were used instead of Tukey tests due to the fact that Tukey tests inflate the alpha ratio unacceptably and are affected by sphericity (Field, 2000). As an interaction effect was found it can be concluded that the high self-conscious golfers experienced a more significant decrease in the stress condition than low self-conscious golfers (Field, 2000). This can be seen when observing the means (see Table 5.2).

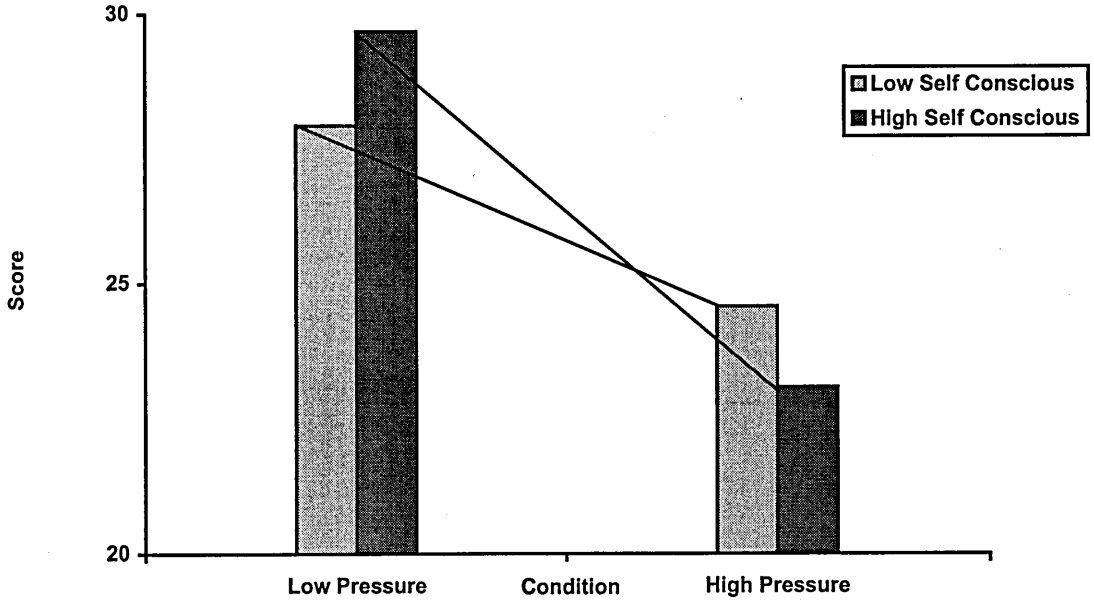
Table 5.1. Means ± Standard Deviations for the Self-consciousness Scale

	Total Self-consciousness Score	Private Self-consciousness Score	Public Self-consciousness Score	Social Anxiety Score
High Self-consciousness	54.3 ± 3.77	23.3 ± 3.55	17.7 ± 2.46	13.3 ± 2.57
Low Self-consciousness	32.2 ± 8.46	12.7 ± 2.31	11.8 ± 3.74	7.8 ± 4.03

Table 5.2. Means ± Standard Deviations of Golf-Putting Scores

	Low Stress		High Stress	
Level of Self-consciousness	M	SD	M	SD
Low Self-conscious	27.92	4.10	24.58	3.11
High Self-conscious	29.67	3.39	23.08	2.07

Figure 5.1 - Performance Scores for High and Low Self-conscious Golfers in High and Low Stress Conditions.



High self-conscious golfers mean scores decreased from (29.7 ± 3.39) in the low stress condition to (23.1 ± 2.07) in the high stress condition. Low self conscious golfers mean scores decreased from (27.9 ± 3.39) in the low stress condition to (24.6 ± 3.11) in the high stress condition.

The analysis also revealed a significant main effect for condition ($F_{1,11} = 45.5$, $p < 0.5$). No main effect was found for self-consciousness ($F_{1,11} = .014$, $p = 0.908$). These results supported hypothesis one, which stated that individuals low in self-consciousness would perform significantly poorer in the stress condition. However, high self-conscious golfers performance also significantly decreased, this fails to support hypothesis 2. As high self-conscious golfers performance decreased significantly greater than low self-conscious golfers this finding fails to support hypothesis three.

Analysis of Anxiety Responses. The effectiveness of the stress condition was assessed through analysis of the ARS data. The items for somatic anxiety, cognitive anxiety and self-confidence were analysed using a two-way ANOVA with one repeated measure (see Table 5.3).

Somatic Anxiety : A condition by self-consciousness interaction was not found ($F_{1,11} = 0.29$, $p = 0.60$). No main effects for condition ($F_{1,11} = 1.57$, $p = 0.22$) or self-consciousness ($F_{1,11} = 0.16$, $p = 0.21$) were found following the analysis. The results indicated that somatic anxiety was not affected by the stress manipulation.

Cognitive Anxiety : A condition by self-consciousness interaction did not emerge ($F_{1,11} = 2.31$, $p = 0.14$), but findings did indicate significant main effects for condition ($F_{1,11} = 5.53$, $p < 0.05$). No main effect was found for level of self-consciousness ($F_{1,11} = 1.83$, $p = 0.19$). The results indicated that the stress condition created a significant increase in cognitive anxiety.

Self-confidence : A condition by self-consciousness interaction effect was found for self-confidence ($F_{1,11} = 5.5$, $= p < 0.05$). Subsequent paired *t*-tests (Roberts

Table 5.3. Means ± Standard Deviations for Anxiety Rating Scale

	Low Stress			High Stress		
ARS	Somatic Anxiety	Cognitive Anxiety	Self-confidence	Somatic Anxiety	Cognitive Anxiety	Self-confidence
Low	1.58 ± 0.67	1.75 ± 0.75	5.58 ± 0.98	1.75 ± 0.75	3.08 ± 0.99	5.33 ± 0.98
High	1.83 ± 0.83	2.83 ± 1.34	5.25 ± 1.36	2.25 ± 1.29	4.00 ± 1.04	3.75 ± 1.06

& Russo, 1999) established that only the high self-conscious golfers' self-confidence scores decreased significantly in the high stress condition ($t = 3.95$, $p < 0.05$). Kinnear and Coln (2000), state that interactions can sometimes invalidate main effects, yet this is not always the case. Therefore, main effects were also analysed. Main effects for condition ($F_{1,11} = 10.9$, $p < 0.05$) and self-consciousness ($F_{1,11} = 6.83$, $p < 0.05$) were also found. The results indicate that high self-conscious individuals experienced significantly lower levels of self-confidence in the high stress conditions. The results also indicate that high self-conscious individuals experienced significantly lower levels of self-confidence in the high stress condition. The main effect for condition suggests that self-confidence was significantly lower in the high stress condition than in the low stress condition.

Practical Assessment Data

The questions addressed to the participants in the questionnaire were all related to their thoughts, feelings and emotions when performing in the experimental conditions. The data were initially divided into high and low self-conscious participant's perceptions and was then broken down again into responses to the high and low stress conditions.

High Self-conscious Individuals in the Low Stress Condition. Only two common themes evolved from the questionnaires. These were: physical responses and cognitive responses. Within this condition the most common physical characteristics cited by the participants were feeling comfortable, calm and confident. Mentally however, participants appeared to show less positive characteristics. One participant stated "I still felt as if there was pressure on me , because you still want to perform well". Another golfer stated "I was very keen to do well because there was someone watching me (the experimenter)". It appears that within this condition the high self-conscious participants still perceived some implicit pressure.

Low Self-conscious Individuals in the Low Stress Condition. Three common themes were generated from the questionnaires. These were physical responses,

cognitive responses and technical aspects. The most common physical characteristics were feeling relaxed and having no tension. Mentally the participants appeared to show very positive characteristics without any of the golfers citing negative thoughts in this condition. One participant commented "I felt good, as there was no pressure on me". Other common characteristics included being mentally relaxed, confident and having no negative thoughts. The technical characteristics most commonly cited in the questionnaires were feeling natural, flowing and automatic. Interestingly two of the low self-conscious golfers made reference to their technique not feeling good throughout the no stress condition, however neither participant attributed this to anxiety. One commented "When I was putting I felt as if there was a little tension in my stroke", another stated "My stroke just didn't feel as fluid as usual".

High Self-conscious Individuals in the High Stress Condition. Five common themes were established from the questionnaires. These were cognitive anxiety, somatic anxiety, compensatory strategies, self-consciousness and conscious control. It appeared that within this condition the high self-conscious individuals experienced considerable physical and cognitive symptoms. One participant stated "At one stage I missed four in a row, I started to think negatively, like why I am missing such easy putts. The more I thought the worse it got". Another golfer made reference to the simple nature of the task and how that affected his thinking, "You are just thinking, this is a straight forward putt, I should be able to get this in every time, yet when you miss one and your score goes down, then you start to worry". One golfer made reference to the relationship between the somatic and cognitive anxiety "the anxiety started off as being purely mental and then went to physical".

Many references were made to somatic anxiety when performing in the high stress condition. Four of the high self-conscious participants described these feeling as everything 'tightening up'. Five golfers cited feeling increased muscular tension specifically in the wrist and hands. These somatic symptoms had an effect on the participant's technique. One participant stated "I started getting apprehensive about how I was playing the shot and worrying about my technique". Technical problems

included pulling across the ball, hitting the ball too hard, jabbing the putt and the stroke not feeling smooth.

Due to the increased somatic and cognitive anxiety, many of the participants attempted to try a number of compensatory strategies. These included releasing the putter more, focusing on breathing, focusing on the ball, using visualisation, focusing on a pre-putting routine and trying to clear the mind.

Conscious control and self-awareness was often cited by the participants as being a factor that limited their performance in the high stress condition. One golfer stated "I internalised and started to scrutinise myself too much". The golfers commented on focusing on their technique whilst putting, one golfer stated "I started to concentrate far too much on my technique and lost focus on the task of getting the ball in the hole". Another golfer stated "I felt very self-conscious, which was really bad because it distracted me" another stated "I was preoccupied by the fact that someone (the confederate golf professional) was analysing me whilst I was putting". Four participants suggested that they were concerned about what other people's perceptions of them were. One golfer commented "I was very much aware about how I looked and what other people were thinking about me and my golfing ability". Another stated "I'm fairly self-conscious, self-critical, fairly aware of my surroundings, this didn't help".

Low Self-conscious Individuals in the High Stress Condition. Two common themes were established through the analysis of the raw data. These were cognitive anxiety and compensatory strategies. Cognitive anxiety was a factor that many of the participants thought limited their performance. The source of this anxiety appeared to be the scoring system rather than the golf professional. For some of the low self-conscious golfers the fact that someone was analysing their performance acted as a positive influence. This was highlighted as several of these participants asked the confederate professional if they could talk about their technique after the testing was completed. One golfer stated "The scoring system made me quite anxious, the fact that somebody was watching me made me more motivated to perform well".

Another commented "I really wasn't worried what the coach thought of me, I was more concerned about my score". Many of the participants made reference to negative thoughts in this condition. One participant stated "You are expected to get each putt in so everyone that you miss sows a seed of doubt in the back of your mind". In order to combat these negative thoughts the golfers adopted a number of compensatory strategies. These included positive self talk, positive imagery and focusing on their pre-putting routines.

5.4. DISCUSSION

The results support hypothesis one as low self-conscious golfers did experience a significant decrease in performance in the stress condition. However, the results fail to support hypothesis two as high self-conscious golfers also experienced a significant decrease in performance in the stress condition. The results of this study failed to provide support for hypothesis three. This hypothesis proposed that individuals low in self-consciousness would be more likely to show significant performance decrements under stress than those high in self-consciousness. In the present study low self-conscious golfers did experience a significant difference between the high and low stress conditions. However, their decrease in performance was not as significant as for high self-conscious golfers. Thus, in the present investigation a high stress condition produced more significant performance decrements in high self-conscious golfers. This finding fails to support the personality traits associated with Baumeister's (1984) theory of choking.

All participants completed the ARS (Cox et al., 1995) before each experimental condition to investigate their perceptions of anxiety. With respect to cognitive and somatic anxiety no interaction effects were found. However, main effects were found for cognitive anxiety for condition and level of self-consciousness. These results indicated that cognitive anxiety increased significantly in the high stress condition. The results also indicate that self-confidence scores significantly decreased in the high stress condition. Therefore, the significant decrease in performance by high self-conscious golfers can in part be explained by the decrease in self-confidence and

increases in cognitive anxiety. These findings suggest that the stress manipulations used within this investigation were successful.

In order to gain further insight into the perceptions of the golfers' experiences under stress, practical assessment questionnaires were administered on completion of the testing. It was thought that these questionnaires could help to provide further explanations for the decrease in performance in the high stress condition. The results produced some important insights into the thoughts and feelings of the participants throughout the experimental conditions. An interesting finding was that in the no stress condition high self-conscious golfers reported feeling physically quite relaxed whereas mentally they reported themselves to still feel quite anxious. The source of this anxiety appeared to be the presence of the experimenter and the experimental condition being experienced. The fact that the experimenter was observing them and their overall score was being recorded appeared to increase cognitive anxiety. In contrast the low self-conscious golfers did not perceive this condition to cause either somatic or cognitive anxiety. Despite this, two low self-conscious golfers reported feeling disturbances in their technique which they attributed to physical tension. Interestingly, neither of these golfers attributed the changes in their technique to anxiety.

In the high stress condition both high and low self-conscious individuals reported increases in cognitive anxiety. For high self-conscious golfers, cognitive anxiety was induced by the fact that the task was relatively simple and that the strokes were being analysed by a golf professional. One high self-conscious participant stated "You miss a putt and you start to worry about what the professional who is watching you is thinking, you start to wonder what he's thinking, (gives example) 'this guy can't play, he can't make a three foot putt', it's then that you start to doubt yourself". The high self-conscious participants also reported considerable increases in somatic anxiety, these symptoms included physical tension, mostly within the wrist and hands. For low self-conscious golfers the negative scoring system appeared to be the central cause for increased anxiety levels. Some low self-conscious participants actually made reference to the fact that having someone analysing them affected their

performance positively. For this reason it would have been useful to include a directional anxiety scale on the ARS questionnaire, as some individuals obviously perceived the high stress condition to facilitate their performance.

The practical assessment data do provide some support for the mechanisms of Baumeister's (1984) model of choking. However, the findings do not support the personality traits associated with choking (Baumeister, 1984). In the present investigation high self-conscious golfers made reference to becoming more self-conscious about themselves and in turn tried to consciously control their putting actions. Previous research in this thesis has established that attempts to consciously control golf-putting is detrimental to performance (see Study 2). For high self-conscious individuals their attention appeared to be divided between the negative perceptions of the golf professional and focusing on the process of the task. However, for low self-conscious individuals, their decrease in performance can be attributed to increases in cognitive anxiety. The fact that a professional golfer was analysing them acted as a form of positive motivation in some cases.

The conscious processing hypothesis (Masters, 1992) can explain how decrements in performance result from experiencing increases in anxiety. This hypothesis suggests that when an individual experiences increases in anxiety they attempt to consciously control their movements using explicit rules. Such a focus disrupts the natural automaticity of the skill (Masters, 1992). Further research by Liao and Masters (1999) has found that self-focused attention increases responses to psychological stress. Based on this previous research it can be hypothesised that high self-conscious individuals could be more vulnerable to conscious processing when under stress. This theoretical perspective could explain why high self-conscious golfers experienced significantly greater performance decrements in the present study.

Further research that has focused on the personality traits that are more vulnerable to performance decrements under pressure has come from Masters et al. (1993). Masters et al. (1993) called this natural disposition, reinvestment. Masters et al. (1993) developed a reinvestment scale that sought to measure reinvestment as a dimension of personality. Those that scored high on this scale are said to be more

likely to reinvest control over their actions under pressure. Within this scale, eleven of the twenty items were taken from the self-consciousness scale (Fenigstein et al.,1975). Those scoring high on this scale were said to be high reinvestors. Thus, being highly self-conscious was seen to have a high correlation with high reinvestment, such a perspective is contradictory to the findings of Baumeister (1984). Masters et al. (1993) stated

> ".....the greater the individual's predisposition towards self-consciousness the greater the chance that the individual will think about what he or she is doing and hence the greater chance that reinvestment of controlled processing will occur" (p.656).

A further dimension of the reinvestment scale was items taken from the cognitive failures questionnaire (Broadbent et al., 1982). Masters et al. (1993) found that this measure could predict failure of golf-putting under pressure. The final component of the reinvestment scale came from the emotional control questionnaire (Roger & Nesshoever, 1987). This factor was rehearsal. Rehearsal involves mentally rehearsing cognitive events, such as negative life experiences.

If conscious processing is responsible for the decrements in performance observed in high self-conscious golfers, then a number of theoretical implications need to be considered. Thus, further theoretical perspectives need to be considered that can explain the mechanisms by which individuals regress to conscious processing. A theoretical perspective that can explain this mechanism is Eysenck's (1992) processing efficiency theory. This theory states that when performers are cognitively anxious they are more likely to invest effort into the skill which they are performing. Under high anxiety the individual should be able to maintain good performance as long as they perceive that they have a moderate chance to succeed at the task. However, if the individual increases their effort to a great extent then they can lapse into conscious processing (Masters, 1992) and subsequently they will experience dramatic decreases in performance (Woodman & Hardy, 2001). As data related to the effort of the participants were not collected during the present study, no firm

conclusions can be made regarding processing efficiency theory. However, intuitively, processing efficiency theory does provide a further explanation of how automatic skills can regress to conscious processing when placed under stress. Many theoretical models could help to explain the results obtained in this study, and some of these perspectives have looked at the way arousal interacts with attention in order to disrupt automaticity. The way that attention and anxiety interact during performance has been studied by Carver and Scheier (1988). They proposed that anxiety increases self-focused attention. This self-focused attention is involved in both task engagement and in a dysfunctional response to anxiety. Thus, if the person is self-focused, this may not be detrimental if the individual has favourable expectancies to achieve their goal. However, individuals whose performance deteriorates under pressure may be focussed on negative aspects of the self. Such a negative focus would include self-doubts and the thought that they will not be able to achieve their goal. Carver and Scheier (1988) proposed that individuals who have such a focus will attempt to disengage from the task. If behavioural withdrawal is not possible then the individual will withdraw mentally. Thus, performance decrements caused by increased anxiety depend on the expectancies of being able to cope and being able to carry out the action intended. If the individual has favourable expectancies, then they will continue to attempt the task and experience few performance impairments. Once the individual has unfavourable expectancies the results are decreased effort, physical withdrawal, psychological disengagement and ultimately an impairment in the behaviour of the person. When being observed and analysed it could be that high self-conscious individuals are more prone to experiencing a negative self-focus as outlined by Carver and Scheier (1988).

The findings from this investigation provide some support for the components of Baumeister's (1984) model of choking. However unlike Baumeister's model (1984) the personality trait that was found to be more associated with choking effects was high self-consciousness rather than low self-conscious. These findings also support the research of Masters et al. (1993) who suggested that individuals high in self-consciousness would be more likely to reinvest control over automatic skills. These results provide support for high self-conscious individuals being more prone to

experiencing detriments in performance when under pressure. The challenge for future research will be to try and establish coping strategies to help individuals who are prone to conscious processing maintain their performance while experiencing stress.

CHAPTER 6

6.0. STUDY 4 - REINVESTMENT: LEARNING TO COPE WITH CONSCIOUS PROCESSING UNDER STRESS

6.1. INTRODUCTION

The previous studies in this thesis have established that high self-conscious golfers were more likely to experience greater performance decrements than low self-conscious golfers. Study two highlighted the fact that when golfers were instructed to consciously control their technique they experienced decreases in their performance outcomes. Study three established that high self-conscious golfers experienced greater performance decrements when placed under stress than golfers low in self-consciousness. The findings from study three did not support the personality traits associated with Baumeister's (1984) model of choking. The findings did show similarities to those of Masters et al. (1993) who investigated the 'reinvestment' of controlled processing as a characteristic of personality. Unlike Baumeister (1984), Masters et al. (1993) view high self-consciousness to be an aspect of 'reinvestment' a characteristic of individuals who have a greater disposition towards conscious processing when under pressure. Masters et al. (1993) developed a reinvestment scale that included a number of measures including the cognitive failure questionnaire, the emotional control questionnaire and the self-consciousness scale.

Masters et al. (1993) suggested that reinvestment was a personality trait and that individuals who scored highly on this scale were more likely to show choking characteristics when under pressure. Masters et al. (1993) have also established that individuals who score highly on the reinvestment scale are more likely to experience skill failure under pressure than those low in reinvestment when performing a golf-putting task.

Masters (1992) investigated the way in which skills are learnt and whether this influences their breakdown when under pressure. Masters (1992) found that individuals who did not have explicit knowledge about putting technique performed significantly better than those who did have knowledge about the movements involved. Hardy et al. (1996b) replicated this study and their findings supported Masters' (1992) explicit learning hypothesis.

Within the present study a psychological intervention was carried out using techniques that access the right hemisphere of the brain. Previous models of stress management have established that techniques such as mental imagery access the right side of the brain (Davidson & Schwartz, 1976). These techniques allow the individual to access a more natural, automatic way of thinking and avoid over-analysis and negative thinking (Davidson & Schwartz, 1976).

There has been a wealth of research that has focused on the positive effects of mental imagery (Jones & Hardy, 1990a; Orlick & Partington, 1988). The positive effects of using imagery include building self-confidence, focussing attention, learning new skills as well as developing relaxation. It has also been established that elite athletes are more proficient at using imagery than non-elite performers (Hall, Rogers & Buckolz, 1991). A focus for research into imagery and sports performance has been the imagery perspective used by athletes (Mahoney & Avener, 1977). Imagery perspective is the distinction between 'internal' and 'external' imagery. Mahoney and Avener (1977) defined external imagery as; "a person views himself from the perspective of an external observer", whereas internal imagery was a referred to as "a real life phenomenology such that the person actually imagines being inside their body and experiences those sensations which are expected in the actual situation".

Previous research has tended to conclude that using the internal imagery perspective is superior to the external perspective. This is because internal imagery also allows the individual to experience the kinaesthetic feel of the experience (Corbin, 1972; Hale, 1982; Lane, 1980; Suinn, 1983; Vealey, 1986). Weinberg and Gould (1995) stated that 'Internal imagery makes it easier to bring in the kinaesthetic sense, feel of movement, and approximate performance skills. For example using an internal imagery perspective, a golfer might become more aware of how their body feels and looks during their swing' (p.287). However, equivocal research findings have also been reported in the academic literature regarding imagery perspectives and performance (Epstein, 1980; Mumford & Hall, 1985). These findings led Murphy (1994) to conclude that researchers should focus their attention on the differential effects of imagery perspectives on factors such as confidence or on identification and correction of technical mistakes.

White and Hardy (1995) have argued that a third imagery perspective needs to be considered, that of kinaesthetic imagery. Kinaesthetic imagery refers purely to the internal mechanisms that are experienced such as 'how it feels to swing a golf club' rather than how it looks. White and Hardy (1995) have proposed that kinaesthetic imagery and internal imagery are different and that the two should not be considered to be the same.

Recent research by Crews (2001) has proposed that psychological techniques such as imagery can help to stimulate right-brain activity. Crews (2001) found that individuals who choke under stress during a golf-putting task, are more dominant in left-brain activity, whereas successful golfers had equal activity on both sides of the brain. Hence it was concluded that psychological techniques that stimulate the right-side of the brain could counteract choking effects.

The present study attempted to introduce a coping mechanism into the learning of a golf-putting task. This study uses the reinvestment scale (Masters et al., 1993) to identify individuals who are more likely to reinvest conscious control of their putting technique when placed under pressure. Masters et al. (1993) found that the reinvestment scale can predict skill failure for a golf-putting task. However, in the current study the experimental groups were taught a coping strategy throughout the learning of the skill that could counteract conscious processing under pressure. The previous research has shown that individuals who experience the 'yips' reinvest control over their behaviour when under stress. The research has also shown that individuals who experience the 'yips' are unable to visualise themselves performing successfully.

A finding from the first study in this thesis was that individuals who experience the 'yips' had an internal imagery perspective and were unable to see themselves performing the task successfully. The individuals also reported experiencing the kinaesthetic feel of a 'yipped' performance whenever they used imagery and subsequently saw negative consequences. Such a focus leads to a greater awareness of the conscious control of the technique and also the negative emotions associated with skill failure. Based on this previous research, the present study investigated the use of positive internal and positive external imagery with individuals who are

naturally high or low reinvestors (Masters et al., 1993). A learning experimental paradigm was chosen for the present study for a number of reasons. Firstly it was thought that acquiring golfers of similar skill level would be problematic, secondly it was thought that giving experienced golfers psychological techniques that could be detrimental to their performance would be unethical. Thirdly, it was felt that experienced golfers would have established their own psychological techniques in their pre-putting routine, and therefore the experimenter would not have been able to control for existing psychological skills during the testing.

Hypotheses formulated were :

H_1 - High reinvestors will experience greater performance decrements than low reinvestors in the stress condition.

H_2 - High reinvestors who learn golf-putting in association with external imagery will perform significantly better under stress than those who learn from an internal perspective.

H_3 - Low reinvestors who learn golf-putting in association with internal imagery will perform significantly better under stress than those who learn from an external perspective.

6.2. METHOD

Participants

Thirty-two participants (mean ± standard deviation : age = 24.4 ± 7.33 years) provided written informed consent and were recruited. Sixteen of the participants were male and sixteen were female, with each experimental group being balanced for gender. All the participants were novice golfers. The criterion to classify as novice was that the participants had no previous experience in playing golf. The reinvestment scale (Masters et al., 1993) was originally administered to 164 students and staff who were novice golfers from Sheffield Hallam University. In order to

qualify for the experiment the participants had to score below 5 or above 15 on the reinvestment scale (Masters et al., 1993). Obtaining a score within these ranges established that the participant was either a high or a low reinvestor (Masters et al., 1993). All potential participants who scored within these ranges were contacted and asked if they would like to participate in a golf-putting study. Sixteen high and sixteen low reinvestors were recruited for the study.

Apparatus

The participants putted from 4 and 5 feet on a flat carpet in a sport science laboratory. Balls were in ten positions in a semi-circle around the hole. Standard size golf balls (4.27 cm in diameter) and golf hole (10.8 cm in diameter) were used throughout the testing. All the participants used the same 'Odyssey' golf putter.

Measures

Reinvestment. Initially the reinvestment questionnaire (Masters et al., 1993) (see Appendix 8) was administered to 164 students and staff attending Sheffield Hallam University. Scores >14.18 are considered to be high in reinvestment and scores <5.44 are considered to be low. A coefficient alpha value of 0.80 suggests that the measure has good internal reliability. A correlation coefficient of 0.74 indicated that the scale has good test-retest reliability.

Competitive State Anxiety. A condensed form of the Competitive State Anxiety Inventory -2 (CSAI-2) (Martens et al., 1990) was used throughout the study. The ARS (Cox et al., 1985) (see Appendix 7) consists of three statements that are measured on a Likert scale. Each question relates to the subscales of the original CSAI-2. For details of the ARS see (study 3).

Performance. Performance was measured by the number of successful putts made in the stress condition. Throughout the learning phase of the study the number of successful putts were recorded, however they were not included in the statistical analysis.

Practical Assessment. The practical assessment questionnaire contained four questions regarding the participant's performance. The check established whether the participants had adhered to their treatment instructions. The questions were: 'Did you perceive the golf task to be important', 'Did you use the imagery in the competition condition ?, 'How much effort did you put into your performance ? and a final social validation question 'were the procedures acceptable to you ?'.

Experimental Conditions

The skill acquisition phase. Throughout the learning phase eight participants were assigned to one of four groups. These were: high reinvestors (external imagery), high reinvestors (internal imagery), low reinvestors (external imagery) and low reinvestors (internal imagery). A difficulty when conducting any study with a learning protocol is matching the participants on skill. The need to ensure that the participants did not have the opportunity to acquire their own mental strategies prohibited any pre-testing. Therefore, participants were randomly assigned to groups on the assumption that skill level would be equal across groups (Masters, 1992). This assumption was tested in accordance with Masters' (1992) learning studies in which the first set of putts for each group was statistically tested to ensure that there were no significant differences in performance score. A one way ANOVA was carried out on the data, no significant differences were found ($F_{1,28}$ =.057, p =.98). As no significant differences were found it was concluded that the groups were balanced for skill. Each participant made two hundred practice putts in the learning phase. In previous putting studies the number of learning putts has varied. Bright and Freedman (1998) used 160 putts, whereas Masters (1992) and Hardy et al. (1996b) used 400 learning putts. In these studies the task was to putt across a 12.5% incline from a distance of 3 metres. In the present study a flat putting surface and a shorter putting distance was used, therefore the skill was more simplistic and hence a reduced number of practice trials was considered to be sufficient to make the participants proficient at the skill. The task was designed so that novice golfers would feel confident in the task after the completion of 200 putts and would subsequently feel that that they could perform well in the competition condition. The task involved putting 50 balls at each session over four testing sessions. Throughout the learning phase the participants were taught to use imagery from either an external or an

internal perspective. The participants were encouraged to include this visual image in their pre-putting routine. The participants were given no technical instructions on how to putt.

External Imagery. Sixteen participants were taught to use external imagery throughout the skill acquisition phase of the experiment. This was done through the use of direct video feedback. After each set of ten putts the participant was required to watch themselves putting on a television screen linked to a video. This visual image was used to teach the participant how to visualise themselves externally. Once the participant was comfortable with the image of themselves from an external perspective, they were asked to visualise themselves successfully putting the ball from this perspective before every putt that they made. The participants were given a list of imagery guidelines to follow throughout the testing (see Appendix 9).

Internal Imagery. Sixteen participants were taught to use internal imagery. They were taught to see themselves putting successfully as if 'through their own eyes' by following the imagery guidelines. Before every putt participants were instructed to image a successful putt as part of their pre-putting routine. At the end of each set of ten putts the participants were required to perform an imagery exercise where they visualised themselves putting successfully through their own eyes. Within this condition the participants were also encouraged to use kinaesthetic imagery so that they would be aware of how the stroke felt throughout its execution. The participants were given a list of imagery guidelines to follow throughout the testing (see Appendix 9).

Performance Under Stress. In the stress condition the participants were told that they had reached the competition phase of the experiment in which they were required to make twenty-five putts. The participants were informed that they were now in competition with the other 31 participants in the study. They were informed that on the completion of the task their final score would be sent to them in a league table so they would know how well they had performed in relation to the other competitors. Further stressors in this condition included a negatively marked scoring system, in which marks were taken away for missed putts. They were also told that the testing session was going to be recorded using a high-speed video camera and

used to analyse their putting technique. These manipulations were found to cause significant stress in study 3. The participants were given an explanation of the competition condition prior to testing (see Appendix 10).

Procedure

Each participant performed the learning trials individually and was informed that this was simply a golf-putting study. Upon arrival at the laboratory, participants were given a brief explanation of the testing procedure. The participants were then told to make the first ten putts before being given imagery instructions. The internal imagery group were then given instructions about what to focus on during their pre-putting routine and were told to image themselves making a successful putt. The external imagery group were shown video feedback of a successful putt from their previous ten putts on a large television feedback screen. If the participant had not made a successful putt in their first ten putts they were required to complete another ten before gaining visual feedback. Participants were told to try and image a successful putt from an external perspective (similar to that being viewing on the monitor) before each putt. All experimental groups were given a set of imagery instructions to follow throughout the learning phase. On completion of the final competition condition the practical assessment questionnaire was administered. This questionnaire was included to ensure that the participants had been able to follow the imagery instructions and that they had continued to use the guidelines throughout the study.

Data Analysis

In order to examine the effect of stress on golf-putting performance in high and low reinvestors a 2 (imagery) x 2 (reinvestment) Analysis of Variance (ANOVA) was conducted. Separate analyses of variance were also conducted on each component of the ARS.

Quantitative Data

Analysis of Performance Scores. The means and standard deviations for putting scores can be seen in Table 6.1. A two-way analysis of variance (ANOVA) for reinvestment (high or low) and imagery (internal or external) was carried out. A significant reinvestment by imagery interaction was found ($F_{1,28} = 5.03$, $p < 0.05$) (see Figure 6.1). The interaction was attributed to high reinvestors performing significantly poorer in the internal imagery condition (Field, 2000). Subsequent paired *t*- tests (Roberts & Russo, 1999) confirmed that the only significant difference was between the high reinvestors in the external imagery group and those in the internal imagery group ($t = 3.19$, $p < 0.05$). The score for high reinvestors in the internal imagery condition was (13.3 ± 3.12) and for the high reinvestors in the external group the mean score was (18.0 ± 2.00) (see Table 6.1). A main effect was found for imagery condition ($F_{1,28} = 11.3$ $p < 0.05$). No main effect was found for the reinvestment condition. The findings established that the participants in the external imagery condition performed significantly better than those in the internal condition. The statistical analysis revealed that the high reinvestors performed significantly worse in the internal imagery condition than they did in the external imagery condition.

Analysis of Anxiety Scores. The items for cognitive anxiety, somatic anxiety and self-confidence were analysed using a two-way ANOVA (see Table 6.2).

Cognitive Anxiety. No interaction effects were found ($F_{1,28} = 0.94$, $p = 0.34$). A main effect was found for reinvestment ($F_{1,28} = 5.1$, $p< 0.05$), but not for imagery ($F_{1,28} = 0.10$, $p = 0.74$). The results suggest that high reinvestors were significantly higher in cognitive anxiety prior to the competition phase than the low reinvestors.

Table 6.1 Means and Standard Deviations for Putting Performance

	Imagery			
	Internal		External	
	M	SD	M	SD
High Reinvestors	13.3	3.12	18.0	2.00
Low Reinvestors	16.8	3.20	17.8	1.38

Figure 6.1 – Performance Scores for High and Low Reinvestors for Internal and External Imagery conditions.

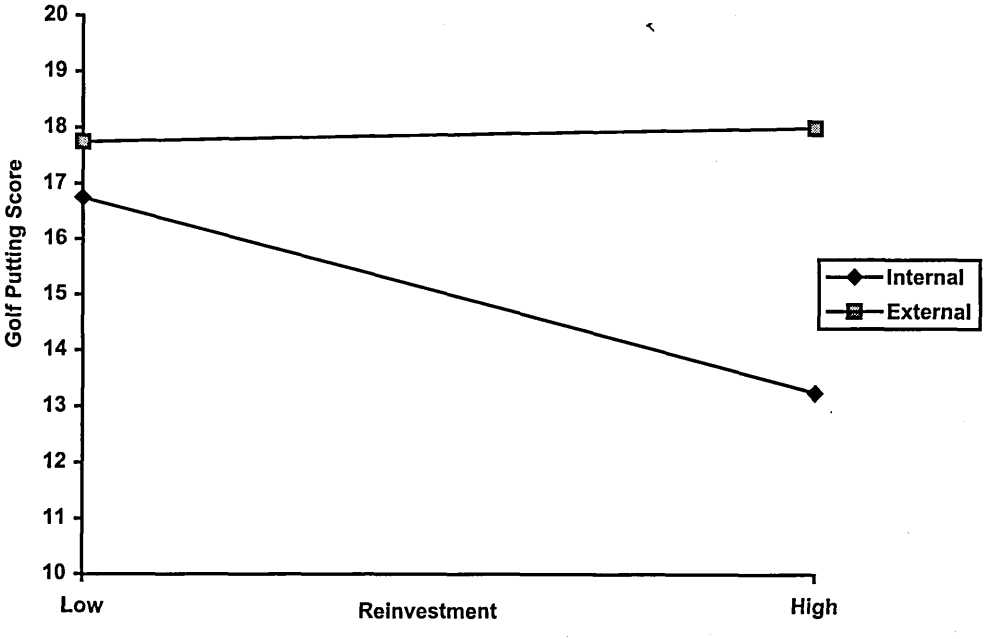


Table 6.2 Results of the ARS for Somatic Anxiety, Cognitive Anxiety and Self-confidence (mean ± standard deviation).

	External Imagery			Internal Imagery		
Reinvestment	Somatic Anxiety	Cognitive Anxiety	Self-Conf	Somatic Anxiety	Cognitive Anxiety	Self-Conf
Low	3.00 ± 1.30	2.62 ± 1.18	4.12 ± 1.35	3.25 ± 0.88	2.87 ± 1.35	3.75 ± 1.28
High	2.87 ± 0.83	3.88 ± 0.84	3.67 ± 0.83	3.37 ± 0.91	3.37 ± 0.91	3.50 ± 0.75

Somatic Anxiety. An interaction effect did not emerge ($F_{1,28}$ = 0.12, p = 0.73). Main effects were not found for reinvestment ($F_{1,28}$ = 0.00, p = 1.0) or for imagery ($F_{1,28}$ = 1.1, p = 0.30). The results suggest that there were no significant differences in somatic anxiety before the competition condition.

Self-confidence. No interaction effect was found for self-confidence ($F_{1,28}$ = 0.00, p = 1.0). No main effects were found for reinvestment ($F_{1,28}$ = .42, p = 0.52), or for imagery ($F_{1,28}$ = .94, p = 0.33). The results suggest that there were no significant differences in self-confidence between the experimental groups.

Practical Assessment. The practical assessment questionnaire contained questions regarding the participants' performance. All the participants stated that they had used the imagery skills taught to them in the learning phase during the competition condition. All participants stated that they had put considerable effort into their performance and that that they felt the procedures were acceptable. A number of participants highlighted that they would not have found it acceptable to be observed by others in the final condition.

6.4. DISCUSSION

The aim of this study was to examine the use of imagery to cope with conscious processing when experiencing stress. The study used a learning protocol and incorporated individuals who were dispositionally high or low in reinvestment (Masters et al., 1993). The first experimental hypothesis that high reinvestors would perform significantly worse in the stress condition than low reinvestors was not supported. The second experimental hypothesis that high reinvestors who learn external imagery would be able to perform significantly better than those that learn the task using internal imagery was supported. The third experimental hypothesis that low reinvestors who learn golf-putting in association with internal imagery will perform significantly better under stress than those who learn from an external perspective was not supported.

The second experimental hypothesis was based on the premise that when an individual uses internal imagery they are in touch with their thoughts, feelings and emotions (Vealey, 1986). Whereas, when using external imagery, participants are able to see a successful performance with less focus on internal mechanisms. It has been established that high reinvestors are more likely to consciously control their movements when experiencing stress and thus have a natural internal focus (Masters et al., 1993). It has also been established in this thesis that consciously controlling movement is detrimental to performance. Previous research has supported this theory (Deikman, 1969; Keele, 1973; Klatzky, 1984; Langer & Imber, 1979). Thus, it can be suggested that positive external imagery may be able to counteract the negative effects of conscious processing (Masters, 1992).

The results also established that external imagers performed better than internal imagers regardless of their reinvestment condition. This was because a significant main effect was found for imagery. This result was not expected as it was thought that low reinvesters may benefit more from internal imagery. This postulation was based on the fact that low reinvestors have no natural disposition to reinvest conscious control and that previous research has found the internal imagery perspective to more successful (Corbin, 1972; Lane, 1980; Suinn, 1983; Vealey, 1986). A possible explanation for external imagers performing significantly better may be that they were able to observe themselves performing on a monitor throughout the learning phase. This positive feedback could have enhanced self-confidence and subsequently influenced performance under stress. However, the results of the ARS did not indicate increases in self-confidence for external imagers. The findings provide support for Whiting, Bijlard and den Brinker (1987) who found that using external images helps individuals to stabilise movement patterns whilst learning a skill.

Results from the ARS established that high reinvestors were significantly higher than lower reinvestors in cognitive anxiety prior to the competition condition. However, no differences in self-confidence were found between the experimental groups. As this anxiety measure was recorded prior to the final stress condition it cannot be determined what the anxiety responses of the participants were during the testing protocol. Hence, it cannot be substantiated how the respondents coped with stress throughout the competition procedure.

Theoretical links can be made between the findings of this study and those of Masters (1992) and Hardy et al. (1996b). These studies established that participants who learnt a golf-putting task with knowledge of explicit rules about technique performed significantly poorer than those who learnt the task with implicit knowledge. It was proposed that those individuals with explicit knowledge were more likely to reinvest conscious control over their actions when experiencing stress, whereas those with implicit knowledge had no knowledge of the components of performance. In the present study, participants who learnt the task using external imagery would be less likely to develop explicit rules about their putting technique. This because they will be less likely to use kinaesthetic imagery and therefore will be less likely to be in tune with their internal mechanisms whilst performing under stress. Such a focus also reduces the likelihood that individuals will consciously control their actions. In the present study participants who had a natural disposition towards reinvestment of conscious control were able to maintain their performance under stress by learning a golf-putting task with external imagery. Further theoretical support for these findings comes from Crews (2001) who found that techniques that access the right-side of the brain could prevent conscious processing and ultimately choking.

An explanation of why the high reinvestors in the internal imagery condition deteriorated when under stress could be underpinned by explicit knowledge (Masters, 1992). The internal imagers would have been able to relate to their internal experiences more easily throughout the learning phase and subsequently could have developed explicit knowledge about the components of the task. Whereas, the high reinvestors who learnt using external imagery would have imaged the skill as a whole and been less likely to construct explicit rules about the components of performance. This position is argued by Hardy et al. (1996b), the authors suggested that using imagery techniques which focus on the skill as a whole (holistic imagery) could enable learners to produce conceptual representations of movements and encourage automatic functioning. Thus, such a form of imagery in the learning phase could help to counteract conscious processing when the skill reaches automaticity. These authors also suggested that holistic forms of imagery could help elite athletes avoid the debilitative effects of anxiety. In the present study, participants with a natural disposition towards conscious processing who used external imagery performed significantly better than those who used internal imagery. Therefore, the links

between external imagery, holistic imagery and conscious processing require further enquiry.

A limitation of this study is that it did not control for the participants dominant imagery perspective before testing. This was not included due to the stringent participant recruitment related to the reinvestment scale. A further factor that should also be acknowledged is that internal imagery does not necessarily generate kinaesthetic responses. This is important because previous researchers (White & Hardy, 1995) have emphasised a clear difference between these two perspectives, which may have implications for future work in this area. In the present study internal imagery was combined with kinaesthetic imagery based on the notion that this perspective is more conducive to kinaesthetic sensations (Corbin, 1972; Hale, 1982; Lane, 1980; Suinn, 1983; Vealey, 1986). Therefore, future research should focus on the relationship between different imagery perspectives, kinaesthetic sensations and coping mechanisms under stress.

The findings from this study suggest that using external imagery can negate the reinvestment of conscious processing by high reinvestors within a learning paradigm. The challenge for future studies will be to establish whether similar mental skills can enhance the performance of individuals who experience long-term reinvestment of conscious processing, such as those who experience the 'yips'.

CHAPTER 7

7.0. STUDY 5: AN INTERVENTION STRATEGY FOR GOLFERS WHO EXPERIENCE THE 'YIPS' WHILST PUTTING

7.1. INTRODUCTION

The early studies in this thesis established that a series of factors that could be influential in intervention strategies for individuals suffering from the 'yips'. The previous study established that individuals who had a high disposition to reinvest control in skills under stress found the use of external imagery acted as a positive coping mechanism whilst putting. The current study attempted to incorporate a number of findings from this thesis into a psychological intervention package for individuals who were suffering from the 'yips' in golf. Previous research that has investigated the characteristics of the 'yips' has concluded that 'yips' victims are unable to visualise themselves successfully performing (McDaniel et al., 1989, Sachdev, 1992). These findings were also supported in study one of this thesis which established that cricketers who had experienced the 'yips' were unable to image successful performances after experiencing the 'yips'.

Research by Thomas and Over (1994) has found that successful golfers use domain specific psychological skills, such as focusing and refocusing attention, visualisation and emotional control techniques. These techniques result in greater psychomotor automaticity and more commitment to golf. Cohn (1991) conducted a study on peak performance in golf. The findings suggested that peak performance was defined by a narrow focus of attention and complete immersion in the task. Further characteristics included feeling in complete control of emotions, thoughts, arousal and performance. Golfers played with high levels of self-confidence, with no fear of the outcome and were unconcerned by the negative consequences of poor shots. The golfers also reported the use of clear and vivid imagery.

It is clear from previous research into the 'yips' that sports practitioners who suffer from the problem have developed poor performance expectations and use psychological skills in a detrimental way. A further finding from study 1 of this thesis was that all the 'yips' sufferers used internal imagery, and therefore associated their imagery with their thoughts, feelings and emotions, throughout the visualisation (Murphy & Jowdy, 1992). Because

this imagery has negative outcomes, these internal thoughts simply reinforce the negative expectation of skill breakdown. In the clinical literature many interventions have used imagery to help individuals deal with phobias such as fear of flying (Bernstein & Beaty, 1971). The link has been made between interventions used for clinical phobias and those that could be used by sports practitioners in previous research on sports performance phobias (Silva, 1994). This thesis attempted to make the connection between the symptoms seen in a sport performance phobia (Silva, 1994) and those seen in the 'yips' (Smith et al., 2000). Through the use of external imagery the individual is asked to see themselves in a phobic situation, yet be detached from the negative thoughts, feelings and emotions that they usually attribute to that experience. Research by Hale (1982) found that when individuals image from an internal perspective they produce more electrical activity in the biceps than when they used an external perspective. Thus, internal imagery makes it easier to experience the kinaesthetic senses (Weinberg & Gould, 1995). As golfers with the 'yips' do not want to associate with these internal feelings, then external imagery could be a better perspective from which to image performance.

The present study sought to establish whether a psychological intervention package which included the use of external imagery could enhance the performance of golfers who experience the 'yips' whilst putting under stress. A single subject replication-reversal (ABAC) design was deemed the most appropriate design for this investigation because it allowed the monitoring of reversals in behaviour (Kazdin, 1992).

The following research hypotheses were formulated :

H_1 . Golfers will experience decrements in putting scores in a stress condition without the use of a psychological intervention (phase B).

H_2 - Golfers using the psychological intervention of external imagery will be able to maintain their putting scores in a stress experimental condition (phase C).

Participants

The participants were three male golfers (mean age = 22.3 years). They had handicaps ranging from 12 to 14 and had at least 6 years of playing experience. The participants all reported experiencing a physical disruption in their technique when putting three to four foot putts in stressful situations. All three participants stated that they did not experience the same physical disruption to their technique when playing in practice conditions. All three of the participants perceived that the problem was initiated by pressure. Based on this information, all three participants would be placed towards the psychological end of the 'yips' continuum as established by Smith et al. (2000). The participants also reported constant negative thoughts about making putts of three and four feet putts during competitive matchplay. The participants also stated that they were unable to image themselves making successful putts at this distance without getting the kinaesthetic sensation of a 'yipped' putt during the imagery. All the participants had a dominant internal imagery perspective prior to the intervention as based on the Vividness of Movement Imagery Questionnaire (Isaac, Marks & Russell, 1986). The participants all provided informed consent before participating in the study.

Pre-Experimental Measures

Semi-Structured Interview. A semi-structured interview was carried out with each of the participants. The interview was conducted to establish each participant's personal experience of the 'yips'. The main focus of the interview investigated the physical and mental sensations that the golfers experienced when putting under stress. Participant one described his perception of trying to make short putts as follows, "There's a lot more pressure on the short putts, which is probably down to higher expectancy, you have to get them, because it's a shorter distance. You feel more under pressure, your technique struggles a lot more on the short ones, because you are thinking about it, instead of concentrating on the putt. Maybe your thinking.....I should be getting this, this shouldn't be a problem....and then it sort of all seems to go wrong". Participant one highlighted the effects of stress on his putting stroke, "you just try to break your technique down, you would be saying 'keep the stroke nice and smooth, focus on the ball, keep your head down,

you just start breaking down your technique, and it's not as automatic as it should be". Participant one also described the physical sensations when putting short putts as, "you feel as if your muscles are tightening up and hands might be shaking, the putt won't be as smooth as normal.....your back swing will be shaky and wouldn't be able to follow through straight, you get involuntary reactions". Participant one expressed that these symptoms were made worse during increases in stress. Participant two commented on his thoughts when having to make a short putt under stress. He stated "The hole seems to get smaller, and you can hear people around you that you are competing against, they seem to be putting me off, because they are wanting you to miss because they're going to get that shot lead. I prefer putting from the edge of the green, because there's no pressure, it's usually the closer I get, the harder it is to get the ball in the hole, it just doesn't flow, you forget what your putting, you just want to get off the green". Physically participant two described the feeling as "It's in my right hand, the bottom hand where the pace is coming from.....it tightens up rather than being relaxed, you grip the club tighter, you're bringing the club back, and you're gripping harder and your club face is altering.....you just try to get through it". Participant three made reference to his putting performance since experiencing the 'yips' . He stated "You don't feel as confident in your own ability to put the ball in the hole, you start getting shaky, you just don't think you are going to get it in, basically you just don't have the belief".

Imagery Measurement. In order to establish the 'imaging' capabilities of the participants the Vividness of Movement Imagery Questionnaire (VMIQ : Isaac et al., 1986) (see Appendix 11) was administered (see Table 7.1). The measure was used to assess the vividness of movement imagery and to assess the use of internal and external imagery. The measure brings certain images to mind and then requires the individual to rate the vividness of each one from an internal and an external perspective. Hence the measure assesses if the individual is more prone to internal or external imagery skills. The test-retest reliability of the VMIQ was $r = 0.76$ suggesting appropriate reliability. The long term stability of the VMIQ produced no significant difference in mean total scores ($F_{3,141} = 2.14$, $p > 0.05$).

Self-consciousness. This was assessed using the Self-consciousness Scale (Fenigstein et al., 1975) (see Table 7.1). The scale consists of 23 items, each item is rated on a scale of 0 (extremely characteristic) to 4 (extremely uncharacteristic). This

questionnaire was administered to the participants in order to establish the golfers level of self-consciousness and to establish whether they could be classified as high self-conscious based on the previous research in this thesis. The test-retest correlations for the three subscales of the Self-consciousness Scale produced a mean R value of 0.80 (range between 0.73 and 0.84) suggesting appropriate reliability.

Reinvestment. The reinvestment scale (Masters et al., 1993) was administered in order to establish to what extent the participants were naturally prone to conscious processing when under pressure (see Table 7.1). The scale was developed from a number of measures, the private and public Self-consciousness Scales (S-CS) (Fenigstein et al., 1975), the Cognitive Failures Questionnaire (CFQ) (Broadbent et al., 1982) and the rehearsal factor of the Emotional Control Questionnaire (ECQ) (Roger & Nesshoever, 1987). Scores >14.18 are considered to be high in reinvestment and scores <5.44 are considered to be low. This questionnaire was administered to the participants in order to establish the golfer's level of reinvestment and to establish whether they could be classified as high reinvestors based on the previous research in this thesis. A coefficient alpha value of 0.80 suggests that the measure has good internal reliability. A correlation coefficient of 0.74 shows that the scale has good test-retest reliability.

Anxiety Measure

Competitive State Anxiety. Before the first session at each stage of the intervention each of the participants was required to complete a measure of state anxiety. State anxiety was assessed using the modified Competitive State Anxiety Inventory-2 (Jones & Swain, 1992) (see Appendix 12). The scale comprises three subscales; cognitive anxiety, somatic anxiety and self-confidence. The inventory comprises 27 items, with nine items in each subscale. Each participant rated the intensity with which each symptom was being experienced on a scale anchored by 1 (not at all) and 4 (very much so). Thus, scores on each subscale ranged from 9 to 36. Internal consistency (cronbach coefficient alpha) ranged from 0.79 to 0.90 (Martens et al. 1990). Jones and Swain's (1992) directional subscales were also included in the assessment. For the directional scale each symptom was rated on a scale ranging from –3 (very debilitative) to +3 (very facilitative). Thus possible direction scores ranged from – 27 to + 27. Internal reliability has been reported

with coefficients of 0.89 for cognitive anxiety and 0.81 for somatic anxiety (Swain & Jones, 1996).

Dependent Variables

Golf-Putting. Golf-putts of a distance of four feet were chosen as the performance variable. This task was selected because all three golfers claimed to experience 'disruptions' in their technique when putting at this distance. Putts of less than four feet were not considered sufficiently problematic to induce the 'yips', which would in turn have caused a ceiling effect within the results with all participants successfully executing the task. Putts of four feet were also cited as being the most 'fear' inducing in the pre-experimental interviews. Previous research has established that it is at the distances of three and four feet that the 'yips' usually occur (McDaniel et al., 1989, Sachdev, 1992, Smith et al., 2000). Golf-putting performance was measured by the number of successful putts made at each testing session.

Task

To maximise effort and motivation a prize was awarded to the golfer who managed to achieve the highest number of putts over the total number of trials throughout the investigation. The prize was an 'Odessey' putter of the golfer's choice. The putting task was carried out on a flat indoor putting surface. The putting conditions were fast, as these conditions have been highlighted as the most fearful for putters who experience the 'yips' (Smith et al., 2000). The speed of the putting surface was assessed by a Professional Golf Association (PGA) golf professional who described it as being as quick as the fastest greens on the professional circuit. Balls were placed in five positions in a semi-circle, at distances of 4 feet from the circumference of the hole. Before each set of trials the golfers were allowed to have ten putts to familiarise themselves with the conditions. A video camera recorded all of the testing sessions. At each testing session the golfers were required to make 25 putts.

Experimental Design

A single-subject A1 B A2 C (see p.192 – 193) research design (Kazdin, 1992) was implemented to examine the effects of a psychological intervention strategy on golf-putting performance. This design was chosen as it was important to establish that the stress condition caused a substantial decrease in putting performance before the psychological intervention was introduced.

The design required assessment of a stable baseline performance on the dependant variable, before the stress condition was introduced to the golfers (Kazdin, 1992). In the present study the first baseline was assessed over four trials which occurred over four weeks. Once the stable baseline was achieved, the initial stress condition was introduced. Based on the work of Kazdin (1992) all the phases of the intervention lasted the same time. Therefore, each phase has four trials which occurred over a four week period. Hence, data were collected on 16 trials over 16 weeks. The intervention phase also lasted 4 weeks, thus, in total the study lasted 20 weeks.

Treatment : The Psychological Intervention

The psychological intervention consisted of teaching the golfers a series of techniques that could be used in their pre-putting routine. The psychological intervention was administered to the three participants after the second baseline condition had been completed. The psychological intervention was administered over a four week period. During this time the golfers were not allowed to perform in the experimental conditions. Throughout the intervention phase the golfers were required to complete an imagery log book in order to monitor their progress and ensure adherence to the intervention (see Appendix 13).

The first week of the intervention required the golfers to learn how to image themselves putting using external imagery (see Appendix 13 for further details of the four week intervention). Each participant was taken through an imagery session with the consultant, in which they were required to image themselves making successful putts from an external perspective. At the start of each week of the intervention the participants had an imagery session with the consultant to introduce the new skills. At the end of each intervention

week the participants had a further session with the sport psychologist to review their progress. To monitor progress and assess imagery skills, the participants were given a log-book and were contacted daily. A set of imagery guidelines were presented to each participant at the start of the intervention (adapted from Burton, 1989), these were : (a) image the execution of the putt and the outcome ; (b) the more vivid and the more detailed one can make the image the better; (c) image the skill as it occurs on the video; (d) only see yourself perform the skill do not feel it; (e) practice the imagery from an external perspective; (f) image the putt being performed successfully; (g) use imagery to strengthen the 'blueprint' of those aspects of your golf-putting performed well and (h) emphasise the quality of practice and not just the quantity. Throughout the initial baseline conditions each golfer's performance had been recorded using a video camera. This video recording was used to produce a 'highlights' tape which was edited to show the golfers successfully making each putt from each position around the hole. The golfers were encouraged to observe the video to enhance the visual images.

The second week of the intervention required the golfers to establish a holistic trigger word to represent the positive images that they had re-created. The rationale for using trigger words associated with the imagery was that the participants felt that using imagery would be an unnatural addition to their pre-putting routines. Previous research in golf has found that trigger controls associated with best performance imagery can increase positive feelings, cognitions and, subsequently, performance (Pates & Maynard, 2000). In the present study the trigger word was included to induce the positive feeling obtained from the external imagery. The trigger word was holistic to ensure that it did not focus the attention onto a specific aspect of technique and subsequently lead to conscious processing. Therefore, trigger words such as "smooth" or "flow" were used which did not specifically focus on technical issues. In week three during each imagery session the participants were required to include their trigger word within the imagery of their putting routine. In week four the golfers were required to include their trigger word into their actual putting routine whilst maintaining their positive imagery practice. This stage of the intervention was included so that the golfers would not feel that the trigger word was an unnatural part of their routine when playing. Such a perception could lead to an increase in stress via cognitive load and result in a negative influence on performance.

Procedure

Phase A1. In the first baseline condition the golfers were simply required to putt as many balls in their attempts as they could. Each golfer carried out the task independently of the other two participants. The only other person present during the testing was the experimenter. A video camera recorded each putt, however, each participant was informed that the camera was being used as a tool to help them in the intervention part of the study. The participants were all informed that it was the total number of putts from every condition that would count towards them winning the prize and therefore every putt that they made was important to their final score. This information was included in order to maintain motivation in the baseline conditions.

Phase B. The stress condition involved a number of stressors to put the participants under pressure. The same stress manipulations were used as those in study three of this thesis. This study also included a competition stressor. Within this phase all three participants were present throughout the testing. Hence, each golfer was observed by their opposition. In this condition each participant putted in sets of 5 rather than putting 25 continuously, thus, each golfer could see how they were comparing with their competitors. The same negative scoring system was also introduced as used in study 3, this scoring system meant that when a putt was missed a point was taken away, hence the participants were informed that missed putts would be reflected in a reduction of their overall score. However, in reality the total number of putts were collected regardless of those missed. In order to simulate the conditions of a real competitive golf match the participants were informed that any putts that were missed had to be completed. Therefore, if a putt was missed by a large margin then the participant would leave themselves a difficult return putt. If this second putt was also missed another point was taken off their score. Again, this score did not reflect on the total number of putts made, which in effect was only ever related to the first putt executed. This system was introduced to create the illusion of greater stress and the need to make each putt or at worst leave the ball close to the hole, to reflect the situation in an ecologically valid golf-setting. Two new observers were also introduced to the situation to create further stress. One of the observers was a golf professional and the other was a researcher in motor control. The participants were told that both these observers were experts and that they were going to evaluate the golfers on their performance. Finally a different video camera was used to record the testing. The

participants were told that this footage was going to be used to evaluate their putting stroke.

Phase A2. Following the stress condition, a second baseline condition was introduced. This baseline condition was exactly the same as that in Phase A1. This repeated baseline condition was included to ensure that the golfers scores returned to their original baseline. At the completion of this phase the four week psychological intervention was introduced.

Phase C. This condition included all the same stressors as in Phase B. However, in this condition the participants used the psychological skills taught in the intervention phase of the study as part of their pre-putting routine.

Practical Assessment

To provide information about the effectiveness of the intervention, the participants completed a practical assessment questionnaire adapted from Kazdin (1992) and Kendall, Hrycaiko, Martin and Kendall (1990). The participants were asked the following questions: "How did you feel during the performance", "What were you thinking during the performance", "Were there any outside thoughts distracting you", "Did you use the trigger", "Did you experience any problems", "Were you satisfied with the results following the intervention", "Were the procedures acceptable to you", "What was the effect of the intervention", "What were your general beliefs about your performance" and "How much did you put into your performance?" The questionnaire also included social validation questions. Specifically the golfers were asked whether they (a) perceived the golf task to be important, (b) found the procedures of the study acceptable, and (c) felt satisfied with the results (Hrycaiko & Martin, 1996).

7.3. RESULTS

Pre-Experimental Measures

The results from the pre-experimental measures for the S-CS, the Reinvestment scale and the VMIQ can be seen in Table 7.1.

Table 7.1 Scores for the (Self-consciousness Scale), the Reinvestment Scale and the (Visual Movement Imagery Questionnaire)

	Total Self-consciousness Scale	Reinvestment Scale	Vividness of Movement Imagery Questionnaire	
			External	Internal
Participant 1	56	17	51	44
Participant 2	50	18	68	54
Participant 3	52	15	41	31

Table 7.2 Means and standard deviations of golf-putting scores at each phase of the study

	A1		B		A2		C	
Participant	M	SD	M	SD	M	SD	M	SD
1	21.5	1.91	14.0	2.31	20.8	3.30	22.5	1.30
2	19.5	1.30	16.5	1.73	19.0	.81	22.0	2.94
3	20.0	.81	15.5	1.91	22.5	1.91	22.5	1.73

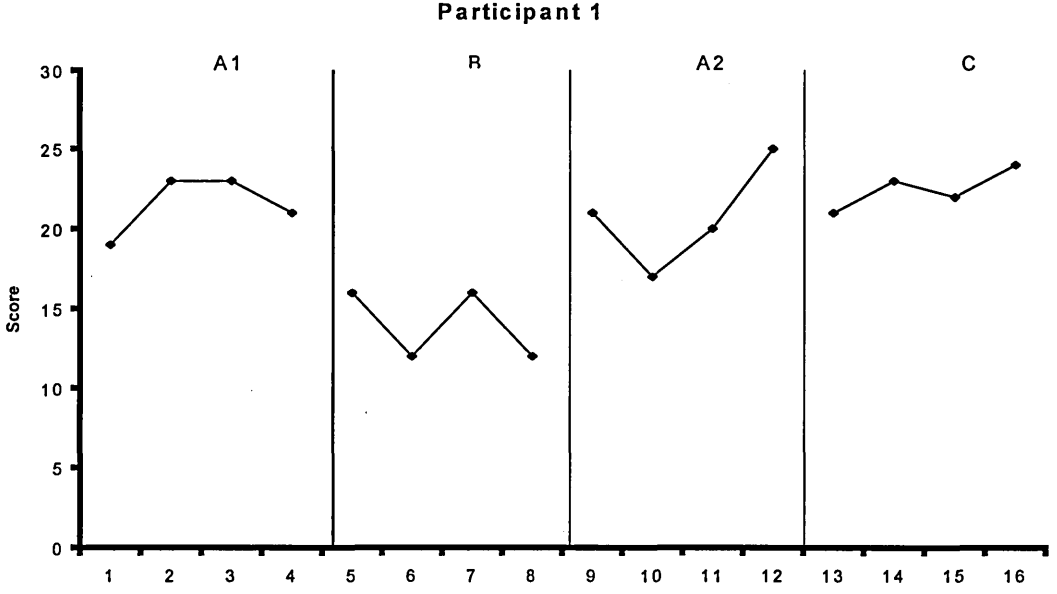
Key

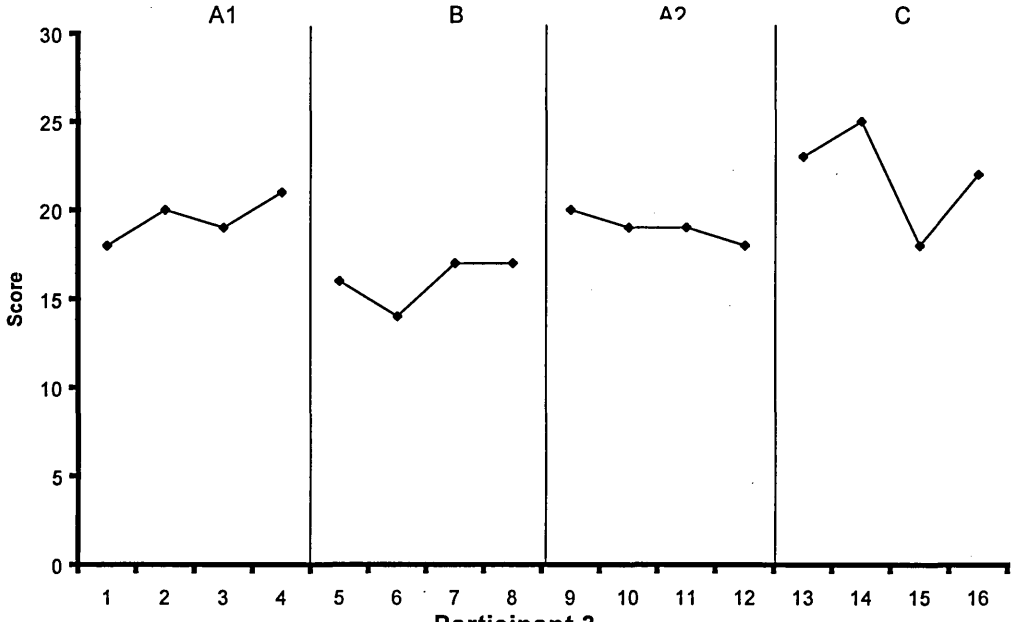
A1 = Phase one – The baseline condition

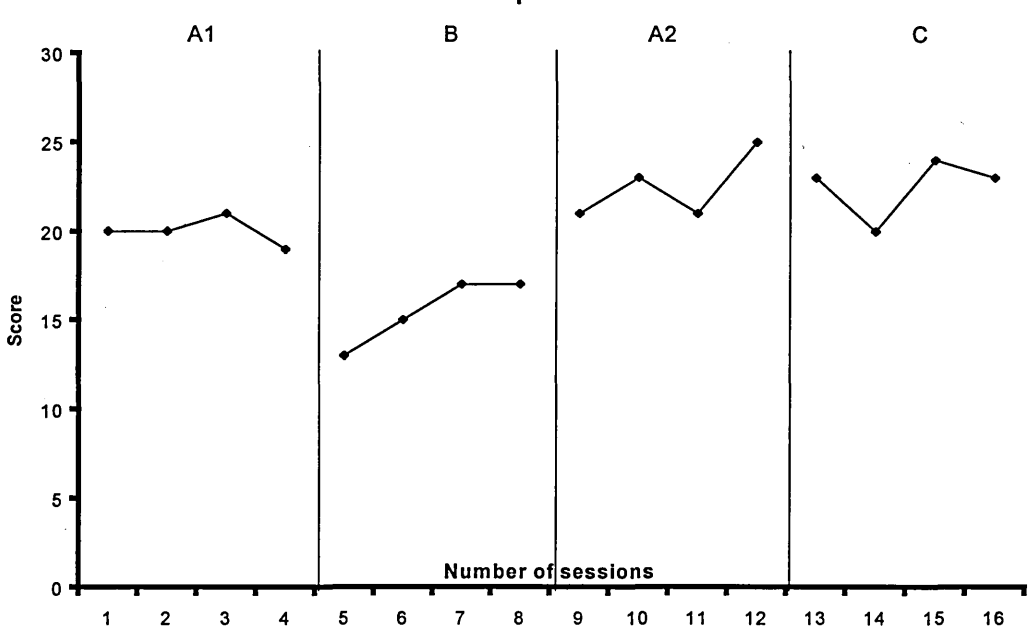
B = Phase two – The first stress condition

A2 = Phase three – The second baseline condition

C = Phase four – The psychological skills condition


Participant 1
A1
B
A2
C
Score
30
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16


Participant 2
A1
B
A2
C
Score
30
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16


Participant 3
A1
B
A2
C
Score
30
25
20
15
10
5
0
Number of sessions
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

The results show that the three participants would be categorised as both highly self-conscious and high reinvestors based on the criteria from previous studies (see studies 2, 3 & 4). The results of the VMIQ indicate that all three participants' dominant perspective was internal imagery.

Golf Performance Data

The performance scores for each participant are presented in Table 7.2 and Fig. 7.1. For each golfer the psychological intervention was followed by an increase in golf-putting performance. This finding suggests that the intervention consistently improved the golf-putting scores. Participant 1 improved from a mean score of 14.0 during the first stress condition to a score of 22.5 in the treatment condition. There were no overlapping data points between the two stress conditions. The performance of Participant 2 also improved from a mean score of 16.5 in the first stress condition to a score of 22.0 in the treatment condition. Again no overlapping data points existed between the two conditions. The third participant also improved his performance from a mean score of 15.5 in the first stress condition to a mean of 22.5 in the treatment condition with no overlapping data points.

Anxiety Data

The cognitive anxiety, somatic anxiety and self-confidence intensity scores at each stage of the experiment are presented in Table 7.3 and the directional scores for each variable in Table 7.4. The scores from the two stress conditions will be compared in the results section in order to establish the changes in anxiety responses when under stress and also to establish the effectiveness of the psychological intervention at changing anxiety responses.

Cognitive Anxiety. Participant one recorded an intensity score of 24 in the psychological skills condition against 26 in the previous condition which indicated a slight reduction. However, a major difference was seen in the direction scores between these two conditions with the first stress condition producing –13 and the psychological skills condition producing –1. For participant two cognitive anxiety scores went down from 34 in the first stress condition to 30 in the psychological skills condition. This was coupled with a decrease in these conditions from –10 to –5 for the directional scale.

Table 7.3 CSAI-2 – Intensity scores for cognitive anxiety, somatic anxiety and self-confidence

	A1			B			A2			C		
Participants	Cog	Som	S-C	Cog	Som	S-C	Cog	Som	S-C	Cog	Som	S-C
1	19	27	17	26	30	16	17	17	26	24	22	24
2	29	21	20	34	28	19	32	21	22	30	24	22
3	12	13	29	36	22	24	18	9	11	29	24	28

Key

Cog – Cognitive Anxiety (intensity)

Som – Somatic Anxiety (intensity)

S-C – Self-confidence (intensity)

A1 = The baseline condition

B = The first stress condition

A2 = The second baseline condition

C = The second stress condition where participants used psychological skills

Table 7.4 CSAI-2 – Direction scores for cognitive anxiety, somatic anxiety and self-confidence

	A1			B			A2			C		
Participants	Cog	Som	S-C	Cog	Som	S-C	Cog	Som	S-C	Cog	Som	S-C
1	-11	-17	8	-13	-14	-7	-6	-6	14	-1	-7	11
2	-4	-5	3	-10	-8	-5	-7	-3	-1	-5	-5	0
3	1	1	12	-12	-15	-11	27	25	27	-4	-2	0

Key

Cog – Cognitive Anxiety (direction)

Som – Somatic Anxiety (direction)

S-C – Self-confidence (direction)

A1 = The baseline condition

B = The first stress condition

A2 = The second baseline condition

C = The second stress condition where participants used psychological skills

Participant three reduced cognitive anxiety intensity from a maximal 36 in the first stress condition to 29 in the psychological skills condition. The directional scores also decreased from –12 to – 4. The results indicate that the psychological intervention resulted in lower cognitive anxiety scores prior to the final stress condition.

Somatic Anxiety. Participant one's intensity scores decreased from 30 in the first stress condition to 22 in the psychological skills condition. The directional scores also decreased from –14 to –7 indicating that the participant perceived their anxiety to be less debilitative following the psychological intervention.

For participant two, intensity scores decreased from 28 to 24 and directional scores decreased from –8 to –5. Participant three reported a small increase in intensity from 22 to 24, however the directional scores decreased from –15 to –2. This suggests that participant three experienced a slight increase in somatic anxiety intensity, yet perceived this to be more facilitative.

Self-confidence. For participant one self-confidence increased from 16 in the first stress condition to 24 in the second stress condition. This increase in intensity score was supported by a large increase in directional scores from –7 to 11. The results for participant two followed a similar pattern to those of participant one. Intensity scores increased from 19 to 22 and directional responses increased from –5 to 0. For participant three self-confidence increased from 24 to 28 with directional scores increasing from –11 to 0. For all three participants self-confidence intensity and directional scores increased prior to the last stress condition.

Practical Assessment

The results of the practical assessment questionnaire provided insights into the perceptions of the participants throughout the testing. Participant one stated that in the first stress condition "I was thinking of others watching, and waiting for me to make a mistake, technique wise I felt quite jittery, I felt really tense, every stroke bothered me, of both mine and the others". Whereas in the second stress condition he commented on a change in self-belief, "I was more focussed on my own game and understanding that I could do it, I kept

positive, I had more belief, as the pressure got more hold on me I had a better chance of dealing with it". Participant two stated that in the first stress condition that he felt "out of control", and was thinking of "what the observers were thinking about the 'jerks' in my stroke". In the second stress condition he felt as though he "was in flow". The same participant commented "the pressure conditions did induce a pressure response, however it wasn't like a real golf match, if you were in a rhythm you tended to go with it. Whereas in a match situation you have to drive, chip and putt". Participant three commented on his thoughts and feelings in the first stress condition "I felt really nervous, I could not stop thinking about what others were thinking. On some putts I was a physical mess. I could not stop my arms shaking". In the second stress condition he commented "I was not so nervous, I wasn't concerned as much about onlookers. The imagery and trigger helped me control any physical sensations and concentrate". Participant three stated that "the mental skills have given me the confidence in my ability to make short putts which previously I had lost". All the participants commented that the procedures of the experiment were acceptable to them and that they were satisfied with the results. All the participants also stated that they had used the trigger throughout the testing. Participant one stated "it personally worked very well for me, helping me relax and have more self-belief". In response to the effect of the psychological skills participant one stated "I had more belief, greater relaxation, mentally and physically, I had tunnel vision towards the task and away from the others". Participant two commented "I had a better rhythm in my stroke". Participant three stated that "the intervention helped me to focus and stay more positive". The participants were also asked to what extent the mental skills had helped them overcome their fear of short putts. Participant one stated "my confidence is the biggest thing that has changed, I have a more positive approach to making short putts". Participant two stated "the skills helped me a great deal, if you get the feeling of the stroke right and feel in control of the club then you're half-way there". Participant three commented "I am more confident now because I have memories of previous success, I can now relate to these memories if necessary when making short putts". In response to the social validation questions, all of the participants stated that the task was very important to them, that they found the procedures acceptable and that they were happy with the results.

The aim of this study was to test the hypothesis that a psychological intervention using external imagery and trigger words could enhance the performance of golfers who suffer from the 'yips'. The three participants showed improvements in their putting performance after the completion of the psychological skills intervention. These findings add support to the findings of Crews (2001) who found that golfers who use techniques which allow the right-side of the brain to function are able to deal with stress more effectively than those who are more left-brain orientated.

Techniques such as imagery and holistic key words are known to stimulate the more creative right-side of the brain (Crews, 2001). In contrast to this, individuals who are processing information in the more analytical left-side of the brain are more likely to experience the conscious processing of automatic skills (Masters, 1992) and subsequently choke. Such findings are contradictory to those of McDaniel et al. (1989) and Sachdev (1992). Both of these studies concluded that the 'yips' were a focal dystonia, and thus were a similar phenomenon to that of writers cramp. Both studies acknowledge the role of anxiety in the experience of the 'yips', however both studies concluded that anxiety exacerbated the problem but was not a central cause (Sachdev, 1992).

The responses to the practical assessment questionnaire provided many insights into the thoughts, feeling and emotions experienced throughout the testing. In the first stress condition the participants made reference to being pre-occupied by the perceptions of the observers, feeling anxious, feeling physical sensations and not being in control of their strokes. After the completion of the psychological skills intervention the participants reported feeling greater levels of confidence, feeling more in control of their stroke and focussing on the task and not on the thoughts of the observers. It appears that the most significant change in attitude was the increase in self-confidence and the belief that they could perform the task successfully. All of the participants had more positive expectations about performance and were focussing on more task-relevant thoughts. No references were made to physical disturbances in the stroke in the second stress condition. A comment made by participant two emphasised the need to be able to feel in control of the club whilst imaging being a significant aspect of his improved performance and a source of

improved confidence. The results suggest that the psychological skills intervention had a positive effect on performance outcomes and also on changing the perceptions of the participants away from thoughts of failure to ones of success.

The responses from the CSAI-2 also reinforced the findings from the practical assessment questionnaires. It can be observed from the scores (Table 7.4) that intensity and direction of self-confidence increased before the second stress condition. This was coupled by decreases in both cognitive and somatic anxiety. To evaluate fully anxiety responses of participants, future studies should attempt to monitor anxiety and self-confidence during performance, such measures could assess how mental skills help performers cope with adversity, as well as change perceptions pre-performance.

The findings from study 5 suggest that if psychological techniques can be used to dissociate from stress whilst putting, then individuals who experience the 'yips' will be able to maintain and even improve performance under stress. The findings of Smith et al. (2000) provided a more conservative view of the role of anxiety in the 'yips' experience which were also more comparable with the findings from study 5.

Smith et al. (2000) concluded that the 'yips' represented a continuum on which 'choking' (anxiety-related) and dystonia symptoms anchor the extremes. Thus, anxiety is considered to be a more dominant factor in the initial cause of the problem and subsequently should be a more significant factor when introducing coping strategies. Smith et al. (2000) concluded that the 'yips' were caused by a number of different factors that interact and could be broken down into three key areas. The first is for golfers who develop the 'yips' due to an overuse injury and experience anxiety as a consequence of their problem. The second is for golfers who are anxious and choke on important putts. However, the largest group of 'yips' suffers were hypothesised to be experiencing an interaction of both factors. Based on the findings of Smith et al. (2000), a psychological intervention strategy should be effective for golfers who experience extreme choking or a combination of dystonia and anxiety-related symptoms.

Study 5 failed to support the findings of Baumeister (1984) and the personality traits that were associated with choking. In study 5 the golfers who experienced the 'yips' scored very highly on the reinvestment scale (Masters, 1992) and on the self-consciousness scale

(Fenigstein et al., 1975). Baumeister (1984) concluded that individuals who were low in self-consciousness would be most likely to experience choking effects when placed under stress. In study 5 the negative performances were induced by introducing a stress variable. This suggests that for the three participants problematic putts were stress-related and that the experience was related to an extreme form of choking rather than being related to dystonia. However, all participants scored highly on the initial self-consciousness measures. Such a finding could suggest that individuals who experience the 'yips' are more likely to be high in self-consciousness and subsequently be high reinvestors (Masters, 1992). This position would support the findings of Masters (1992) who made the link between high reinvestors, conscious processing and the 'yips' experience.

Within study 5, no technical advice was given to the golfers to change their putting style. This was because the experimenter wanted to look specifically at the influence of cognitive changes on performance. If technical modifications are successful in overcoming the 'yips' then this has often been proposed as a rationale for assuming that the source of the problem is dystonia based (McDaniel et al., 1989; Sachdev, 1992; Smith et al., 2000). An alternative perspective on this position could be presented. It could be argued that over time an association develops between the technical behaviours and the negative response of the 'yips', which triggers an anxiety response as highlighted by Silva (1994) in his studies with sports performance phobics.

Thus, in the present study rather than changing the behavioural technique of the participants, the author sought to change the golfers' perceptions of making short putts from negative to positive by using a dissociate form of external imagery. By using external imagery and observing themselves putting successfully in a no-stress condition the participants were able to re-establish the previously successful motor programme. Such a perspective would suggest that this form of imagery allows the individual to re-establish the 'blueprint' (Burton, 1989) of their stroke with the absence of negatives. It would appear that it is this negative association that could tend to trigger the 'yips'. Such an explanation could explain why Bernard Langer has had to physically change his putting technique four times due to each new technique being affected by the 'yips'. Hence, interventions developed to cope with the 'yips' need to based on the sources of the problem. For individuals who only experience the 'yips' in stressful situations such as the participants in this study, psychological techniques that access the right hemisphere of the brain may be

the most beneficial. However, for individuals who experience chronic symptoms in both stressful and non-stressful conditions, a change in technique coupled with psychological skills could be more successful. Clearly future studies will have to address a series of different intervention strategies to combat the 'yips' with individuals who experience the problem to differing extents or because of different sources of the problem.

A consideration when conducting single subject intervention studies is that improvements in performance could be attributed to participant and experimenter bias. Neither the participants nor the experimenter were blind to the outcome, therefore, the experimenter's expectations or the demand characteristics would affect the results. A further consideration is the issue of a possible Hawthorne effect, the change in performance which occurs merely as a function of being in a study (Drew, 1976). It has been proposed that scrutiny of performers in a single subject design might heighten this effect (Pates & Maynard, 2000). However, Drew (1976) observed that this effect declines as the participants become acclimatised to the study. Thus, the length of the study is an important criteria for controlling against the Hawthorne effect. This was conducted over twenty weeks and therefore could have controlled for this effect.

From an experimental design perspective, ABAC designs have a potential limitation. This is because the psychological skills phase is the last stage of the study. Thus, a criticism of the study could be that the participants simply continued to learn throughout the experiment and that their performance peaked at the final stage. To some extent this is controlled for by the repeated baseline condition, in which scores return to baseline following a decrease in the stress condition. In previous single-subject design studies the intervention treatment has been reversible (Pates & Maynard, 2000), therefore the experimenter is able to 'turn off' the intervention in the final stage of testing (ABACB). Such a design can provide more evidence that it is the intervention that is causing the change in behaviour. However, in the present study it was not possible to turn off the psychological techniques, furthermore due to the nature of the 'yips' it was felt that the participants should finish the intervention with a positive perception of performance. Therefore, the final stage of testing was the psychological skills condition.

A limitation of this study is that it has not tested whether the psychological techniques used are successful for the participants in an ecologically valid competitive environment. This

point was highlighted by participant two in the practical assessment questionnaire. The participant made reference to the fact that a continuous putting situation did not replicate the pressure of competitive golf, where participants are required to play a range of strokes as well as putt. This is coupled with the fact that when playing golf participants have long periods of time to reflect on poor shots, between strokes. Therefore, future research should also investigate whether the techniques that have been successful in laboratory conditions can be successfully taken onto the golf course. Furthermore, future research should establish whether the psychological intervention used in this study could be transferable to other sports that are affected by the 'yips' such as darts and, of course, bowlers in cricket.

8.0. DISCUSSION AND CONCLUSIONS

The 'yips' is a phenomenon that has not been fully explored in the academic literature, however questionnaire research has been published which has attempted to establish the aetiology of the phenomenon. (McDaniel et al., 1989, Sachdev, 1992, Smith et al., 2000). Establishing the aetiology of the problem was not a direct aim of this thesis, however, the findings from the initial studies do provide scope for discussion. No previous research has explored the experiences of performers after the onset of the 'yips' or the psychological factors that could underpin the problem. Therefore, the specific aims of this thesis were to identify the psychological characteristics of the 'yips' and to examine the relationship between these factors. A further aim was to establish the possible relationship between the 'yips' and Baumeister's (1984) model of choking. The final aim was to identify psychological coping strategies that could be used to counter the 'yips'. The aim of this chapter is to provide a summary and evaluation of the findings of the research. Recommendations for future research and implications for sport psychologists working with individuals who experience the 'yips' will also be outlined.

8.1. SUMMARY OF FINDINGS

8.1.1. The Aetiology of the 'Yips'

The purpose of the first study was to explore the personal experiences of cricketers who had experienced the 'yips' whilst bowling. Bowlers were chosen rather than golfers for this study because no previous research had been published looking specifically at the bowling 'yips'. Despite the lack of experimental research there have been many anecdotal references to bowlers experiencing the 'yips' in cricket (Moody, 1993). Previous investigations into the 'yips' phenomenon have focussed on questionnaire-based quantitative research (McDaniel et al., 1989, Sachdev et al., 1992, Smith et al., 2000) and subsequently have lacked the depth that qualitative research can produce (Scanlan et al., 1991). An aim of this study was to conduct a qualitative investigation that could gain greater insight into the 'yips' and would subsequently form the basis for future research

studies looking specifically at the mechanisms that underpin the skill breakdown. The primary question for previous researchers addressing the 'yips' has been associated with the possible causes of the phenomenon and as yet they have failed to establish the aetiology of the problem.

This thesis has indirectly considered the aetiology of the 'yips' in cricketers and golfers. The main findings from this first qualitative study were that when the bowlers first experienced the 'yips' it was completely unexpected and that they did not feel anymore stressed than in previous bowling experiences. This finding could support the dystonia hypothesis as the bowlers did not perceive that stress was a major factor in the initial cause. However, all the bowlers cited anxiety as being a major factor in the prolonged initial experience of bowling and subsequent bowling performances. Such findings could suggest that the severity of the 'yips' experience could be based on interpretation of the situation and therefore could be personality based. Some of the bowlers in this study have been able to overcome the 'yips' by introducing 'trick strategies' such as changing their bowling action. This finding is also common in golf putting and is a feature of overcoming focal dystonias such as writer's cramp. In contrast to these findings the golfers in the final intervention study all initially experienced the 'yips' in stressful competitive situations and cited anxiety to be a central cause of the problem. Thus, the factors that initiated the problem were different in these two sports. The number of participants involved in these studies fails to allow any firm conclusions as to the aetiology of the problem, however it would seem that individuals experience this problem in the short and long-term to different extents and that it is triggered by a range of factors. One factor which supports the 'yips' being primarily stress related in golf is that the problem only occurs when an individual is putting over very short distances. It is these distances where expectations are high and perceived stress increases. If the problem is solely due to 'overuse' then other strokes should be affected by the problem, however, this does not appear to be the case (McDaniel et al., 1989). Therefore, the theoretical stance of Smith et al. (2000) that individual experiences of the 'yips' are on a continuum between stress and dystonia is intuitively appealing based on this research. Clearly the personality traits of individuals who experience the 'yips' need to be explored more fully

in order to establish whether some individuals are more prone to experiencing the problem. This is of fundamental importance because regardless of the aetiology of the problem, psychological factors cannot be disgarded in the development of the problem through negative reinforcement.

8.1.2. The Psychological Characteristics of the 'Yips' Experience

All the bowlers in study one claimed to be very high in the personality trait of self-consciousness which they further perceived to be a negative part of their character and a factor that was central to their experiences of the 'yips' (Fenigstein et al., 1975). Similarly the golfers in study five scored very highly on both the self-consciousness scale (Fenigstein et al., 1975) and the reinvestment scale (Masters, 1992). The actual psychological characteristics of the experience mirrored those highlighted in Baumeister's (1984) model of choking. These characteristics included increased anxiety, increased self-consciousness, increased self-awareness, attempts to consciously control the skill and subsequent poor performance outcomes. The major difference between the experience of choking and the 'yips' was the fact that the experience became long-term. Thus, the symptoms of the 'yips' became persistent and consistent. Similarities from these findings can be made with research into sport performance phobias (Silva, 1994). Silva (1994) made the link between permanent skill breakdown in sport and the experiences of those who suffer clinical phobias. Both conditions appear to create a fear of being in the phobic environment and subsequently result in avoidance behaviour. This avoidance behaviour results in a long-term loss of confidence in the individual's ability to perform the skill in question. The loss of confidence results in a strong fear of failure and personal embarrassment. Therefore, the expectations of the individual are of failure and subsequently they are unable to positively image themselves performing well. The findings from this first study highlighted many similarities to research in a number of areas. Firstly, the general experience and involuntary movements experienced during the cricket bowling action showed common features to research conducted with the golfing 'yips' (McDaniel et al., 1989; Sachdev, 1992; Smith et al., 2000). Secondly, the psychological mechanisms underpinning the breakdown in performance were consistent

with those seen in the model of choking (Baumeister, 1984) including the conscious processing hypothesis (Hardy et al., 1996b; Masters, 1992). Finally the long-term nature of the problem has many similarities to experiences found in sport performance phobias (Silva, 1992). Theoretically the long-term nature of the problem shows many similarities to Carver and Scheiers' (1988) control process perspective on attention and anxiety. This theoretical model looks at how self-focus, anxiety and negative expectations interact to create disengagement and withdrawal from a stressful situation. Due to the cyclic nature of the model it is possible to see how individuals can develop a long-term fear of the potentially stressful situation. Such a perspective links closely to the experiences of both the 'yips' and sports performance phobia. Study one provided many important characteristics of the 'yips' experience and also highlighted the links between this phenomenon and the choking model (Baumeister, 1984).

A number of higher order themes were established in study one through the inductive content analysis to describe the experience of the 'yips' in bowlers. To establish which of these experiences were dominant a hierarchy of constructs was developed using the repertory grid technique in the second part of the first study (Kelly, 1955). The five most commonly cited constructs were 'negative self perception', 'no confidence', 'self-consciousness', 'conscious control' and 'physical tension'. These constructs formed the basis for many of the group-based experimental designs that were carried out throughout the remainder of this thesis. This form of analysis produced similar themes and constructs to the inductive content analysis in the first part of study one. Many of the constructs could be linked to the choking model (Baumeister, 1984). Therefore, the psychological characteristics of the 'yips' experience that interact with the choking model were used as the basis for the following studies in this research. Thus, self-consciousness, conscious control and stress were central focuses of the subsequent investigations.

8.1.3. The Mechanisms Underpinning the Choking Model and the 'Yips'

Study two was carried out to investigate if the conscious control of golf-putting was detrimental to performance. The study also examined the role of dispositional self-consciousness. Baumeister's (1984) model of choking stated that skills breakdown when individuals pay conscious attention to them. The model also postulated that low self-conscious individuals were more likely to choke than those that were high in self-consciousness. The hypothesis behind this model was that individuals who were low in self-consciousness were more likely to choke as they will be less experienced in being self-aware and subsequently would be less experienced in consciously controlling movements. The primary aim of study two was to establish if focussing on the process of an automatic skill was detrimental to performance. A further aim was to examine whether low self-conscious golfers would experience greater performance decrements than those high in self-consciousness. The findings from this study supported the theories of Keele (1973) and Kimble and Perlmuter (1970), with the conscious control condition producing lower performance scores. These findings were also consistent with the work of Masters (1992, 1993) who has suggested that the reinvestment of controlled processing over automatic skills is detrimental to performance. The findings from this study established that learning with a focus on the effects of movement rather than the movements themselves was more beneficial to skill development. However, the results from this study failed to support the postulates of Baumeister's (1984) model of choking as high self-conscious golfers performed significantly worse in the conscious control condition. Despite failing to support the personality traits associated with greater performance debilitation, this study does support the first stage of Baumeister's (1984) choking model. This is based on the finding that when individuals attempted consciously to control their behaviour they experienced decrements in performance. Hence, in support of Masters (1992) and Hardy et al. (1996b) it was concluded that conscious processing can be detrimental to performance.

Study three introduced a further factor identified from study one, that of stress. Following the predictions of Baumeister (1984) study three sought to examine the

influence of stress on golfers who were dispositionally high or dispositionally low in self-consciousness. Although the findings indicated that both groups' performance decreased in the stress condition, the high self-conscious group decreased their performance more significantly. These findings revealed further evidence of potential shortcomings in Baumeister's (1984) choking model. However, this study provided support for a dimension of personality termed reinvestment (Masters et al., 1993). Masters et al. (1993) proposed that some individuals would be more prone to skill breakdown through the conscious control of automatic skills, these individuals were defined as being high 'reinvestors'. A component of reinvestment was high self-consciousness thus providing support for the present study.

Study four included a number of factors that emerged from the previous studies. The aim of this study was to examine if individuals with a natural disposition towards reinvestment could learn psychological skills to counteract the problematic conscious processing of skills, when experiencing stress. Study one established that individuals who experienced the 'yips' whilst bowling were unable to visualise themselves bowling successfully subsequent to their first bout of the problem. A further finding was that all of the participants visualised their performance from an internal perspective, thus they were very aware of their thoughts, feelings, physical sensations and emotions when visualising the skill. These findings supported the work of McDaniel et al. (1989), and Sachdev (1992) who found that golfers who experience the 'yips' were unable to visualise themselves putting successfully. Thus, the major focus of this study was to teach both high and low reinvestors a simple golf-putting task, and then to introduce a stress variable. Throughout the learning phase the experimental groups were split into those that learnt with internal and those that learnt with external imagery. It was hypothesised that learning the skill in conjunction with external imagery would be significantly more beneficial for high reinvestors than internal imagery. The findings of the study supported the hypothesis. These results provided theoretical support for the work of Crews (2001) who found that accessing the right hemisphere of the brain can help to compensate choking tendencies in golf-putting. These findings also provided support for the explicit learning hypothesis of Masters (1992) and Hardy et al. (1996b).

These studies found that individuals who learnt a golf-putting task with explicit knowledge about the components of performance experienced greater performance decrements than those that learnt the skill implicitly. Thus, the use of psychological skills that access the right hemisphere of the brain need to be considered when introducing psychological intervention strategies to counteract conscious processing in stressful situations.

8.1.4. Intervention Strategies to Counteract the 'Yips

Study five attempted to introduce the findings from study four and integrate them into a psychological skills package for golfers who experience the 'yips' whilst putting. The findings of this study indicated that, through the use of external imagery and trigger words, the participants were able to counteract the 'yips' and maintain their performance. In addition to the more quantitative findings the participants also commented about how the intervention influenced their perception of their putting performance. All three of the golfers cited the fact that viewing video feedback of themselves putting successfully with a smooth action increased their confidence greatly. Being taught to image themselves performing the task successfully was also cited as a major factor in building confidence and counteracting stress. This was particularly important as all three golfers were unable to visualise successful putts before the intervention. The findings from this study support the findings of Crews (2001) who found that golfers who choked were predominantly using the left-side of their brain, whereas those who performed well had even activity on both sides of the brain. Crews (2001) cites the use of positive imagery as being predominant in getting the right-side of the brain active throughout skilled behaviour. Further support comes from McMaster (1993) and Pates and Maynard (2000), who have found that hypnosis, including deep relaxation and visualisation, can improve golfing performance. These findings indicate that becoming conscious of movements and analytical can be detrimental to automatic skilled behaviour (Masters, 1993). Furthermore, the introduction of stress magnifies this problem and results in the more extreme choking experiences such as those seen in the outcomes of the 'yips'. The

extension of this choking experience then becomes a long-term problem which could be related to personality traits.

This thesis has indicated that individuals who are high in self-consciousness are more prone to choking, work by Masters et al. (1993) has also attempted to identify certain personality traits that are characteristic of 'chokers'. A direction for future research would be to identify which characteristics distinguish people who choke from those who develop long-term performance problems, such as those seen in the 'yips' and sport performance phobias (Silva, 1994). It could be hypothesised that a one off 'choking' experience in sport could be similar to a panic attack in everyday life. If the individual then continues to experience the same symptoms of panic in future situations coupled with negative expectations this could progress into a phobia, resulting in behavioural impairment. Similarly, in sport a choking experience could progress into the 'yips' in the same way. Clearly the mechanisms associated with panic, phobia, choking and the 'yips' needs to be studied in greater detail in future research.

Intervention techniques such as 'trick strategies' need to be explored to establish how physical changes in technique can help to elleviate the symptoms of the 'yips'. Many golfers have found dramatic changes in technique to be highly effective. Theoretically it would be logical that individuals who experience the 'yips' only in stressful conditions would benefit greatly from psychological intervention techniques. Whereas, those performers that experience the problem permanently may need to explore a dramatic change in technique coupled with psychological techniques in order to perform to their potential. The golfer Sam Torrence has been a long-term sufferer of the 'yips', he believed that observing the problem in a fellow golfer was enough to initiate the 'yips' in his own game. He has explored many intervention techniques and eventually found that using the broom-handle putter technique helped him counteract the problem. Despite this physical change being successful Torrence believes the problem was primarily psychological. When referring to his experience of overcoming the 'yips' he commented;

> "I suppose it might be a little bit physical but it's mostly to do with the brain, the brain sends a message to the hands but it does not get past the elbows. It does not happen in a friendly fourball. It happens during the last round of the Open when your mind is telling you of the circumstances. Then panic sets in. It's the worst feeling in the world. Basically I putt one handed now.....I think that they are curable but you always have to change your method". (Chapman, 2001).

This thesis has raised important implications for practitioners working with sports performers. A primary consideration is to try and ensure that performers avoid conscious processing (Masters, 1992) of automatic skills. Many practitioners advocate the use of process goals as a method to stay focussed during performance (Kingston & Hardy, 1994), however, considered that focussing on the processes of performance could result in the reinvestment of explicit knowledge and result in conscious processing. Based on the findings within this thesis it can be argued that the use of holistic process goals (Kingston & Hardy, 1994) which focus on the global aspects of performance could be more beneficial to performers. This type of goal encourages automaticity rather than breaking down the skill into its component parts. Future research may involve practitioners combining the various forms of goal in a variety of sporting tasks to establish the most beneficial technique or combination of techniques in each specific context. Hence, process holistic goals could be more beneficial in closed skills such as golf-putting, whereas process goals may be more beneficial in open skills.

A further consideration for practitioners is the use of external imagery as a technique to counteract the negative impact of conscious processing. Within the present thesis, using an external imagery perspective ensured that individuals who were prone to reinvestment could cope with conscious processing when under stress. Hardy et al. (1996) have suggested that holistic forms of imagery could help performers to cope with anxiety in a similar fashion. Therefore, the use of external and holistic imagery should also be

explored by practitioners as a possible technique to cope with conscious processing under stress.

Practitioners working with performers who experience the 'yips' should attempt to establish the antecedents of the 'yips' in the individual with whom they are working. Thus, if the individual experiences the 'yips' only in stressful conditions the psychological techniques may be highly beneficial to aid rehabilitation. For individuals who experience performance problems in both stress and no-stress situations then a combination of technical changes coupled with psychological techniques could be most beneficial. In order to ensure that performers are able to cope with the transition between practice and competition a period of covert conditioning (Silva, 1994) might need to be considered, where stress variables are gradually introduced to the performer. This covert conditioning is an important process as it allows the performer to develop automaticity and confidence in the skill, at each stage, before progressing back into competition.

8.1.5. A Model of Choking Leading to the 'Yips'

Weinberg (1988) has presented a visual representation of Baumeister's (1984) choking model. The model uses tennis as an example and takes into account the emotionally charged situation, anxiety, attention and performance impairment (see Figure 8.1). Weinberg's (1988) model has been adapted to take into account some of the theoretical findings of this thesis, therefore it includes factors that could potentially lead to the 'yips' (see Figure 8.2). This model should not be considered as a definitive model of the 'yips'. It is a visual model of the choking process which includes some of the findings from this thesis and also previous research (McDaniel et al., 1989, Sachdev, 1992, Smith et al., 2000). The model does not take into account the aetiology of the 'yips', however it considers the personality characteristics that could lead to a more extreme experience. The model also identifies the interaction of the psychological components, which have been considered in this thesis. The first stage of the model outlines the typical personality traits of the individual. Personality characteristics that could be influential over the 'yips' include; self-consciousness, reinvestment, trait anxiety and obsessional

thinking (McDaniel et al., 1989). The second stage highlights the emotionally charged situation. Further considerations at this stage center on how the individuals interpret the situation, which again interacts with their personality. Factors such as self-consciousness, reinvestment and obsessional thinking have to be taken into account, and could determine how significant the choking experience is for the individual. The third stage of the model involves the interaction of anxiety and attention. This process takes into account the sub-components of each of these factors.

The sub-components of anxiety are cognitive (negative thoughts and expectations) and somatic (increased heart-rate, breathing-rate etc). The sub-components of attention are internal (self-awareness) and external (focus on perceptions of others). In Baumeister's (1984) model of choking it is anxiety that leads to attentional changes, however once this begins the two factors appear to interact with each other. Therefore, a combination of these factors leads to performance impairment. In golf these are jerks and spasms in the putting action, in cricket it is a perception of having no control over the direction of the ball. Once the individual experiences this performance impairment, then the outcome of the experience has to be interpreted. It is at this stage that some individuals are more likely to experience chronic symptoms which could lead to the 'yips'. If the individual has the personality disposition related to the first stage of this model then they will be more likely to interpret this experience very negatively and negatively rehearse the experience in their mind. Such a perception reinforces the experience and could lead to a loss of self-belief and negative expectations about future performances. During this process it is important that some form of psychological intervention should be put in place. Based on the findings of this thesis it is important that the individuals experiences positive reinforcement. This can be done through external imagery and video analysis through which the individual can experience performance without the thoughts, feelings and emotions that are associated with the 'yips'. Trigger key words can then be used to help reinforce this positive perception during future performances.

Figure 8.1: The Process of Choking (Weinberg, 1988)

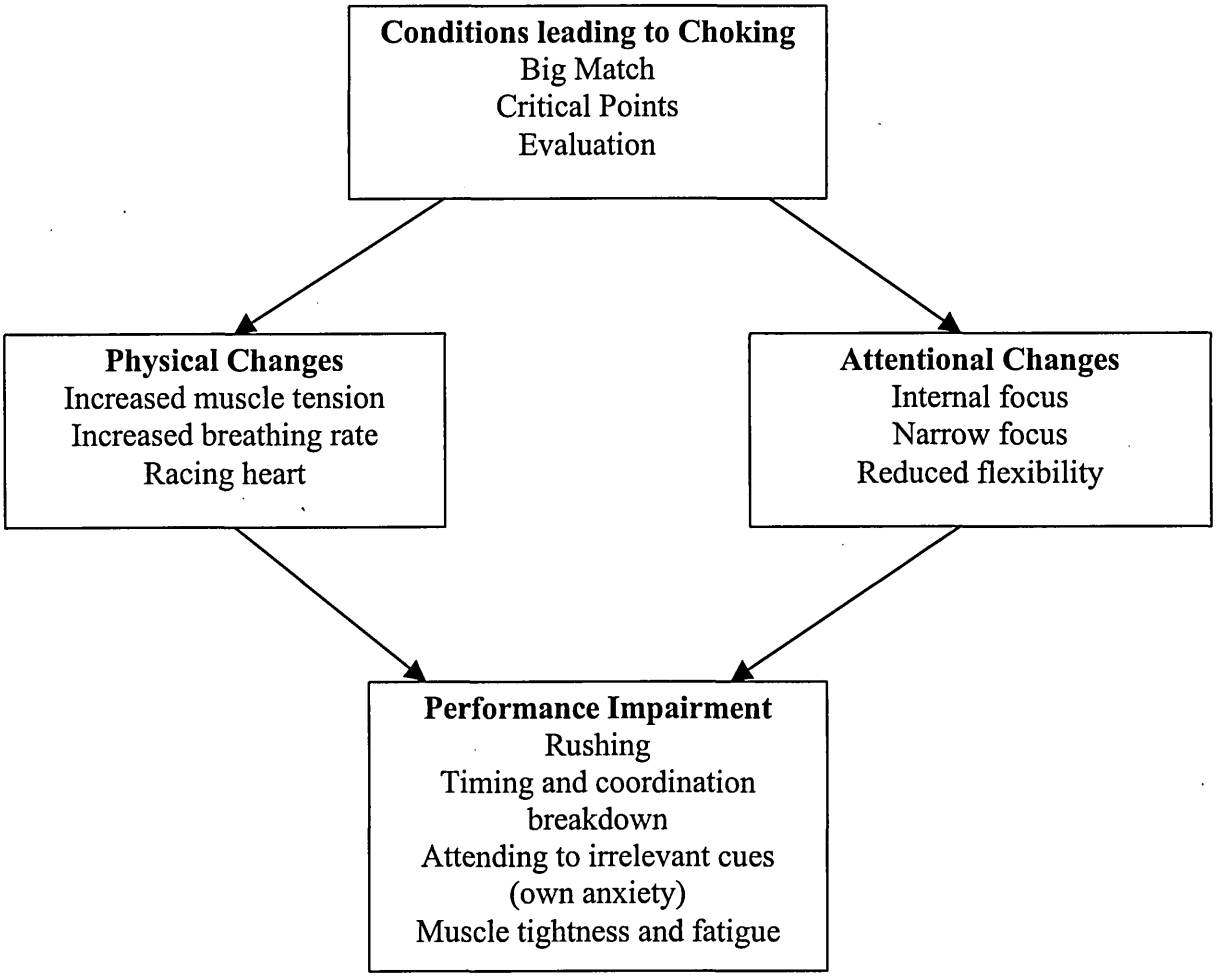
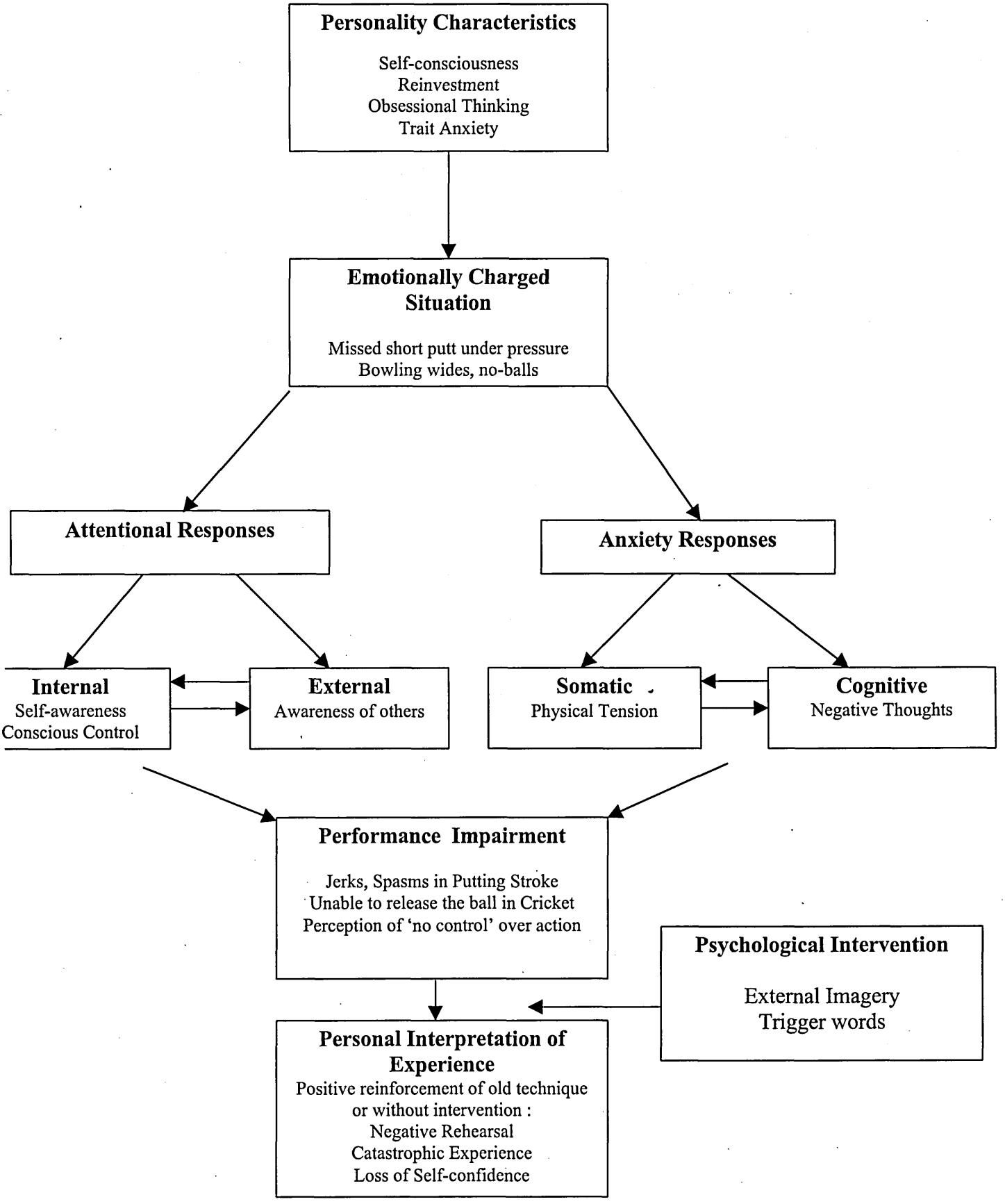


Figure 8.2. The Process of Choking Leading to the 'yips' (Choking model adapted from Weinberg, 1988)



This model could be used as the basis for future research looking at the interacting mechanisms that take place during the 'yips' and the subsequent interpretation of the performance.

8.2. RECOMMENDATIONS FOR FUTURE RESEARCH

The findings of this thesis provide support for the basic mechanisms of the choking model (Baumeister, 1984), however it fails to support the personality characteristics that Baumeister (1984) associated with choking. Despite the fact that this thesis has attempted to make some theoretical links between the 'yips' and choking, research into the 'yips' is still in its infancy. Therefore, the scope for future studies that investigate the 'yips' is wide. The focus of this research should further examine the links between the theoretical model of choking and the 'yips', and more importantly attempt to identify potential causes of the 'yips'. Research into the 'yips' needs to be diverse looking at a number of affected sports in order to develop a more comprehensive knowledge of the problem. The aim of this section is to identify a number of future directions that may be most pertinent for future researchers.

The first recommendation for future research into the 'yips' is the need to investigate the causes of the 'yips' across a number of sports. Many other sports are documented as being prone to the 'yips' yet only golf has ever been formally researched. Thus, the sports of cricket, snooker, tennis, table tennis, archery, darts and shooting should all be investigated to see if there are common symptoms and causes. Research should be focussed on whether the 'yips' are initiated by anxiety (Masters, 1992), by dystonia (McDaniel et al., 1989, Sachdev, 1992) or by an interaction of the two (Smith et al., 2000). Hence, researchers will need to address whether experiencing the 'yips' causes anxiety, or whether anxiety itself initiates the 'yips'. This research should also try and identify common personality characteristics between individuals who suffer from the 'yips'. Previous research has been unable to identify personality characteristics that distinguish golfers with the 'yips' from those who do not experience the problem (Sachdev, 1992). The one exception was the characteristic of obsessional thinking,

which McDaniel et al. (1989) found to distinguish those with the 'yips' from those without. Obsessional thinking is linked to rehearsal which is one of the components of the reinvestment scale. Therefore, indirectly this thesis has taken obsessional thinking into account. However, this personality trait needs to be more directly examined in future research. Future research should also attempt to explore further the role of self-consciousness and reinvestment in the experience of the 'yips' and choking (Baumeister, 1984). Recent research has attempted to identify the sources of choking and whether it is initiated by an attentional shift towards the self or whether it is initiated by distraction (Lewis & Linder, 1997). This research has found support for self-focus mediated misregulation as the primary mechanism for choking. However, in the experience of the 'yips', individuals appear to be caught between self-focussed attention coupled with the evaluation and negative perception of the thoughts of others. Clearly the attentional mechanisms associated with the 'yips' have to be explored fully, taking into account both internal and external factors. In the clinical literature there have been a series of studies that have started to look specifically at maladaptive self-consciousness (Makris & Heimberg, 1995), these measures should be taken into account in future studies in sport. This is an important development as many individuals consider aspects of self-consciousness to be a positive aspect of their character. The aetiology of the 'yips' is a highly important area for future research as it can help to identify the correct intervention strategies to help sufferers overcome the problem. Regardless of the causes of the 'yips', whether they are initiated by anxiety or by dystonia, researchers will have to consider psychological strategies to reinforce individuals' self-belief when they are re-introduced to competition.

A second recommendation for future research concerns the physical changes that are experienced throughout the execution of the skill. In order to examine the changes that are actually occurring, studies should be conducted that examine the kinematic changes in performance. Studies could also incorporate electrocardiogram (ECG) and electromyogram (EMG) activity to establish changes in brain wave and muscle activity. Research investigating the physical changes of individuals who experience the 'yips' has been initiated by Cook (1993) who found that golfers with the 'yips' experienced greater

EMG activity in their forearm than those without. This work has been developed by Smith et al. (2000) who examined heart rate, grip force and EMG activity in the upper arm and forearm in golfers with the 'yips'. This research found that those with the 'yips' had more forearm EMG activity than non-affected golfers in both low and high anxiety putting conditions. However, this research needs to incorporate kinematic analysis to establish physical changes in performance and also EEG measurements to establish brain wave activity. Research focussing on changes of EEG activity has been included in choking studies (Crews, 2001), therefore this research needs to be developed to take into account those who experience the 'yips'. A further consideration may include physical monitoring and measurement of the 'yips' in ecologically valid conditions such as competition.

Research should also focus on potential intervention strategies to combat the 'yips'. Many golfers have experimented with alternative grips, stances and long putters (Smith et al., 2000). Researchers should attempt to establish why these technical changes are able to overcome the 'yips'. The effectiveness of pharmaceutical aids such as beta-blockers could also provide evidence for the role of stress in the 'yips' experience. The findings of the final study of this thesis provided evidence that psychological skills can help improve performance for those suffering from the 'yips'. However, techniques to progress psychological intervention strategies should be considered. Research into hypnosis (McMaster, 1993, Pates & Maynard, 2000) and golf-putting performance should be considered when looking at psychological techniques to help individuals with the 'yips'. To examine the effectiveness of intervention strategies, performance needs to be tested in competition conditions as well as stressful lab-based situations. One further element to be considered when including competition conditions in testing protocols is covert conditioning. Such an approach would allow individuals to experience stress in gradual stages before being exposed to full competition conditions (Silva, 1994).

A further consideration for future research might be to investigate the problem from a neuromotor learning perspective. Smith et al. (2000) have proposed a series of factors for those wishing to study the 'yips' from this perspective. The first of these is whether

the correct motor program is effected by stress and that this negative experience ensures that the 'yips' neuromotor program becomes the learned stored response. Alternatively, it could be that the performer attempts to retrieve the correct motor program yet is unable to execute it, due to neuromuscular problems. Clearly these neurological questions need to be addressed when considering the aetiology of the 'yips'.

A further recommendation for future research concerns the extent of the 'yips' in different individuals. Despite the fact that most golfers who experience the 'yips' only do so in stressful conditions, some individuals claim to experience the same symptoms when they are in both stress and non-stress situations. Therefore, the role that stress plays in the experience of the 'yips' needs to be fully explored. Smith et al. (2000) have expressed a need to develop a scale or continuum to measure the extent of the 'yips' in those that experience the problem. This could be a focus for future research, ranging from individuals who have experienced a one-off choking situation to those that have chronic symptoms in non-stressful conditions and demonstrate avoidance behaviour. Furthermore a questionnaire could be developed that would take into account factors such as self-consciousness (Baumeister, 1984), conscious processing (Masters, 1992), obsessional thinking, trait anxiety (McDaniel et al., 1989) and reinvestment (Masters et al., 1993), in an attempt to identify those individuals who would be more prone to experiencing the 'yips' phenomenon.

Once a greater understanding of the 'yips' has been established then guidelines can be administered to coaches who are working with players who show signs of the 'yips' in their sport. Thus, a series of coaching practices could be developed to ensure that coaches know the correct procedures to put in place to ensure that an acute problem does not become chronic. Guidelines could also be introduced which could help players to avoid choking and ultimately the 'yips'.

8.3. CONCLUSIONS

This thesis has made a number of important contributions to the existing knowledge base in the sport psychology literature. This research provides the first investigation into the 'yips' from a purely psychological perspective, it is also the first to investigate the personal experience of the 'yips' from a qualitative perspective. This qualitative approach has provided a far greater insight into the personal experience of the 'yips' than previous quantitative research. The findings of this research also suggest that the dispositional trait of high self-consciousness has a greater influence over choking and potentially the 'yips' than low self-consciousness. This finding is contradictory to previous research in the area (Baumeister, 1984), and thus, opens up a new perspective from which to study both choking and the 'yips' phenomenon. Finally this thesis is the first research to attempt to provide psychological interventions to counteract the 'yips'. Throughout the final studies the use of external imagery and holistic trigger words were found to be an affective coping mechanism to dissociate from the negative thoughts, feelings and emotions that are associated with the 'yips'. This is an exciting development in the 'yips' research as it can act as a basis for future psychological interventions in sports other than golf.

In summary, this thesis has provided support for the mechanisms associated with Baumeister's (1984) model, however it has questioned the personality traits of those that experience choking as suggested by this model. The research has demonstrated that individuals who experience the 'yips' attempt to consciously control their movements when they experience stress and this results in the breakdown of their performance. The findings of this thesis would suggest that those individuals that would be more likely to experience this conscious processing under stress are likely to be high in self-consciousness and reinvestment. This personality disposition creates a reflective and analytical approach to performance which can be problematic when individuals have negative experiences. This research has also shown that psychological strategies such as using external positive imagery and holistic trigger words can be used to counteract conscious processing under stress. This thesis should be seen as an initial part of the

growing literature which is emerging that is examining the 'yips' directly. The challenge for practitioners, coaches and sport scientists, will be to integrate research findings into everyday coaching principles to ensure that the 'yips' are dealt with effectively and do not become potentially 'career threatening'. Such practical techniques should help to alleviate many of the myths that surround the 'yips' and help performers take a more positive approach to rehabilitation.

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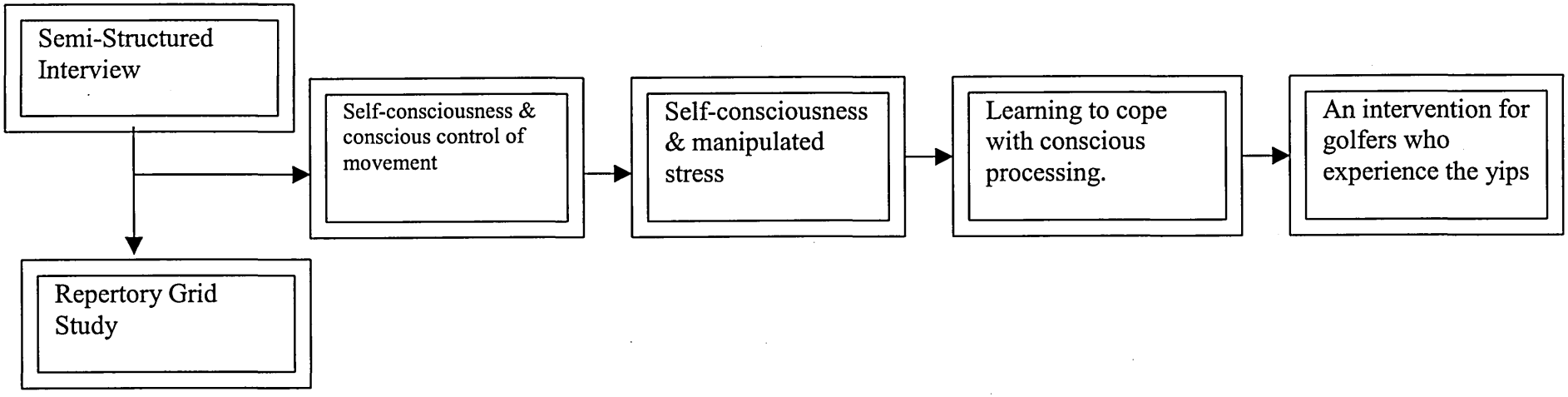
Appendix 1

Flow Diagram of Thesis

Flow Diagram of PhD Thesis

Study One	Study Two	Study Three	Study Four	Study Five
		Time Line for Studies		
1997	1999	1999	2001	2001
		Time for Data Collection		
20 weeks	4 weeks	4 weeks	12 weeks	12 weeks



Appendix 2

Informed Consent Form for Study 1

Informed Consent Form

This study involves exploring your apparent loss of ability to bowl. The aim of the study is to attempt to identify your personal experience of bowling previous to, during and after your loss of ability to bowl. The study includes two interview procedures the first is a semi-structured interview which should last approximately one hour. The semi-structured interview will include:

(1) Introductory comments, including personal details (2) A description of your first bowling experience in which you were aware that there was a problem (3) Conditions before this first experience (4) Descriptions of subsequent bowling experiences (5) Final comments and summary questions.

The second part of the study will require you to construct a repertory grid which involves you identifying characteristics of your bowling experiences and scoring them against a number of different bowling standards. The repertory grid will take approximately one hour to complete.

If you have any questions about the interview procedure then please feel free to ask. If you feel comfortable with the interview procedures outlined above and are happy to be a participant, then please sign below.

I have read the description of the interview procedures and am happy to be a participant in the study.

Name : ..... (please print)

Name : ..... (please sign)

Date .....

Many Thanks

Mark Bawden

Appendix 3

Interview Guide for Study 1a

Interview Guide - Study 1a

1) Introductory questions:

- Explain nature of the interviews, get participant to sign consent form.
- How long have you played cricket ?
- How old are you ?
- What standard of bowler are/were you ?
- What type of bowler are/were you ?
- Are you still playing cricket now ?

2) First experience of the 'yips':

- The focus of this study is to gain an understanding of your apparent loss of ability to bowl. Could you describe for me the first occasion when you felt that there was a problem with your bowling ?

3) Conditions before the first experience of the 'yips'

- Were there any significant factors that influenced your bowling on that particular occasion ?
- How had you been bowling previous to your first experience ?
- Were you okay mentally and physically ?

4) Subsequent bowling experiences:

- How have you bowled since your first experience of the 'yips' ?
- Have you had any positive experiences ?
- Have you had any further negative experiences ?

5) Final comments:

- Have you ever experienced anything like this outside of cricket ?
- Looking back, what factors do you think contributed to the problem ?
- Do you have any further information that you feel was important in your bowling experiences.

Appendix 4

Transcribed Interview

Transcribed Interview

Name : ..... Date of Interview : .....

Standard of bowler .....

First Experience :

The focus of this study is to gain a greater understanding of your apparent loss of ability to bowl. Could you describe for me the first occasion when you felt that there was a problem with your bowling ?

I was back in South Africa, I had come over to England for six months. My bowling was brilliant I was really bowling quick as well, I went home and went to the first nets and things were going well, I was opening bowler for ..... West , I was playing against Keppler (Wessels) and guys like that, my bowling was fine..no problem, then on Thurs., Fri., sat and Sunday there was a four day game. I got home on the Monday, I was employed now by the cricket board, practiced on Tuesday and was fine, practiced on Thursday was fine, on the sat we played a game against a coloured team (diamond park) , we had a really good team, I opened the bowling and things were okay and I bowled one specific ball to a left hander, he edged the ball and Gubby dropped him and I lost it a little bit, I told the guy listen that's not good enough, in not those kind of words, I walked back and then the next ball...Jesus I didn't know what happened. It just didn't want to go straight and it was that specific moment, and I still to this day..... if he hadn't dropped that ball, taken that catch, my spirits would have lifted and I would have just rolled him over.

What actually happened to the ball then ?

It was wide, I started bowling wides, um.....I got through the game because we had to bowl ten overs and I bowled my ten overs for about sixty or seventy, they were pretty pathetic opposition as well. I got through the game and the next game I bowled one or two overs and I said I don't want to bowl, and I gave the ball to the captain and he said come on just keep going and I said no I'm just not interested.

Why was that ?

Because I couldn't bowl straight. Because I used to know how well I can bowl and all of a sudden I'm bowling against a guy that I would have rated my chances 99 to his 1 chance and I couldn't get the guy out.

How did it actually feel ?

It felt as if my hand was not behaving the way it normally used to, it was cocking towards the leg side more often than not my balls were wide down leg and wide down off side.

Did you feel as if you had a chance of getting it back ?

Oh yeah I said I'm gonna crack this I need some practice, I would go down to the nets each day, cos I did the grounds each day, and I would bowl, and I couldn't get it together and I would bowl all over the place. And then a game would come and they would put a bit of pressure on me to bowl and I would run up and take five or six wickets. No problems. And the following Saturday with no pressure on, sssshh wide down leg ssshhhh wide down leg.

So you've actually been able to get it back ?

I've been able to get it back. In between.

So what was different about the games when you got back and where you lost it ?

I've got no idea I probably just ran up and bowled. Um and tried different things like lifting my hand up higher before I delivered the ball and didn't think so much about it.

<u>Conditions before the first experience</u>

Were there any significant factors that influenced your bowling on that particular occasion?

I was probably upset with that guy cos he dropped the ball, and I don't know cos I was so confident and so positive I had just come back and I was feeling really fit and working hard and it just went and I've got no idea why. The last game that I bowled full on was the 24 November 1993 back home I could of played for 2 teams and I turned down one team and played for another and I was playing for the team I turned down. I bowled I think a 17 ball over because I couldn't get the ball straight.

Can you elaborate on how you felt ?

Oh I didn't want to bowl I wanted to say I was injured or something, I wanted to give the ball away.

Actually during the over or before it ?

Actually during the over.

How had you bowling been previous to this first experience ?

I went back to Uni and played first team cricket against ..... university side and I was first change bowler, there was Greg Schaltz opening the bowling with some other guy and then I could bowl again and I got about 20-25 wickets in the first five games averaging about five wickets per game. So I don't know what's happening. I honestly don't. You've seen me bowl, you've seen that I have lost it.

You said you bowled a seventeen ball over how did you actually get through that over ?

I tried to bowl spinners. I couldn't hit the pitch. And that's happened this year up at high field. they play on a synthetic pitch and I couldn't hit the pitch.

How did that feel ?

I was very aware of others without a doubt, yeah of course because they know that you used to be a good bowler and now you can't bowl the thing straight, and you can't get out a batsmen that you would usually get out.

Can you elaborate on your thinking ?

Yeah I was too worried about what their thoughts were than worrying about myself, I should have said stuff them just try and get on and try and bowl it. And probably slow it down and try to bowl it down. I should have forgotten about that I used to run up before this happened and I didn't used to think about what I was doing I would just swing away and it would pitch on the right spot or there or there abouts. Never fully accurate, I was never the most accurate person, but I was always aware that it was going in a certain direction, now I didn't know what direction it was going in.

So, now what was different ?

I had this block in my mind as when I would run up I would think I've got to do this I spose, I've got to pitch it there and move it away or not even move it away, just pitch it there, instead of bowling straight.

Can you remember what it was like after the game, how did you feel after the game, how did you deal with it ?

I just had loads to drink. I just forgot it and concentrated on my batting. My mates used to call me wide balls and all kinds of things. I knew the guys well enough not to take that to seriously. And more often than not we still won the game. We were a good enough team, if they were relying on me it would be a different story.

<u>Subsequent bowling experiences</u>

Have you bowled since your first experience of the yips, have you been able to get it back?

No, I don't know I can get it back. That is why I am not confident. I have had it back at certain times, but I don't know if I pick up this ball today that it will be right.

How does it feel when it's wrong ?

UM. it's by where the ball goes, the ball just disappears down the leg. And the keeper doesn't get it.

What happens then ?

I panic.

Can you elaborate on this for me ?

Well I don't want to bowl. I'd rather field in the covers and chase balls. And yet I love bowling I would love to bowl all day.

How do you complete the over?

I would refer to spin, or bowl donkey droppers, but other times I will bowl five really good deliveries and last one will go astray and that will put me off and then I'll start badly again because of that one bad delivery. It's a nightmare.

So what's happened since then, have you had any positive or negative experiences ?

I now lack confidence. Not just based on that one experience, it has happened a few times. It happened once to start it off and it affected me quite allot cos I was playing a really good standard of cricket back home and I had made the team no problems but afterwards a few of them, Mark Doherty who's on the south African selection committee said that's the worst bit of bowling I've ever seen in my life and I said exactly I don't know what's happened, he said don't worry about it, but it affected me it affected me badly.

Can you expand on how it has affected you badly?

It was a catastrophe, because it stopped me from doing something that I enjoy doing. I can now bat so I can still play cricket and but I'd rather be bowling. I'd rather be bowling all the time and running up and taking forty wickets per season or whatever I want to be bowling I would give up my batting tomorrow if I could bowl.

<u>Final Comments</u>

Have you ever experienced anything like this outside of cricket ?

Golf, putting, I put left handed now.

Is this pre or post the experience you had with cricket ?

Afterwards I'm not a golfer but I'm getting better But I'm not a star. But I used to putt right handed and I used to putt no problem as a youngster, and then about three years ago I was on the golf course and my right hand just gets the.....you now Bernhard Langer....he got the jitters it just gets a little jit. Your hand just moves in a shaking motion. Now I putt left handed in a pendulum type movement, it's not ideal but it's better to putt left handed than not play.

Could you explain the physical feeling whilst putting in more detail please?

Yes it's the mental response that um. something happens to your hand something forces it to do something I don't know why it is , I mean I get so much advice I get advice every day when I'm on the cricket field the other ten guys will give me advice as to what I am doing wrong but nobody knows because I've had some really good coaches such as Macca the second highest rated coach in South Africa. He used to coach me. He got me together but still I used to have days when it would go astray he thought the problem was confidence, lack of confidence, knowing that you used to be able to do it.

Can you expand on this issue of 'confidence', are you confident in your own ability ?

Yes, I can do er ....., no that's silly I am very confident.

So can you rationalise an experience like this to yourself ?

No, because no it's knowing that you could do it and now it's been taken away and it's a skill that I had and was doing quite well and all of a sudden I wasn't in the provincial team any more and that wasn't ideal, that's for sure cos I had a contract with them. So it was pretty horrendous although I got my batting to a standard where I could make the team for my batting.

So, did you experience a lack of confidence in everyday life situations after this ?

No, it did not affect me in that way, in any other sporting ways I still feel confident that I can beat you. It has affected my bowling but not other areas of my life.

So what if tomorrow someone said to you we've got a big game Sussex select eleven and someone chucks you the ball to open the bowling how would it feel ?

It would be a nightmare. It would be an absolute nightmare.

Could you elaborate on why?

Because I wouldn't want to do it . I would rather take a back seat in the field and then bat at 3/4 cos I'm quite confident in my batting.

Okay lets take another scenario, tomorrow we're at the nets ?

I'll have a go at the nets, no problem.

What do you think the difference is ?

Making a fool out of myself.

It's not the competition ?

Oh no way, I would love to compete at all levels. If I was bowling well I would bowl against anybody if I could. It's not the competition it's the lack of confidence. It's the fear inside that I'm going to make a fool out of myself.

Could you expand on this theme of it being 'embarrassing' ?

Well it is embarrassing. When you can't bowl straight. And your supposed to be a bowler, that's why I don't bowl anymore if I am playing for an invitation team. Sometimes I will take a chance, like there was one game when I said if you want me to bowl I'll bowl, but he didn't let me bowl, but in that situation I was confident enough to bowl.

So what about the six a side situation, where you have to bowl ?

Yeah I remember I bowled badly, well I bowled well in the first game and badly thereafter.

You had to bowl in that situation, How did it feel to have to bowl ?

Um I had watched a few of the other guys bowl and they were not .....there was a lot of people watching different people bowl in different games and there were some guys that were worse than I was. I didn't want to bowl um and I lost one game for the guys cos I bowled badly. But I bowled and I just got over with it and got it done.

Can you elaborate on why you haven't bowled since then ?

I have avoided bowling without a doubt, so next year hopefully, I'm going to put myself on and open but that's why I need all the nets in the winter, and hopefully there will be a bit of a run up and I'll just let go and I'll stuff everybody if its going down leg then I won't care I'm just going to have a full go and see what happens.

How do you feel about your experience, now on reflection ?

.....what's the word, It stopped an area of what I was doing in my life because I was playing full time cricket and I think if my bowling had continued I would probably of carried on playing full time cricket and moved around in South Africa. I would played professional for a year or two and then come over here and travelled around a bit. And I obviously didn't have the opportunity to do that so it stopped a certain aspect of my life.

That's not rational is it the fact that you've perfected this skill and one day...

That's it though Mark I never used to think about it, I used to just run up and bowl I used to know what I was going to do whether I was going to bowl a yorker or a bouncer but I had a stock ball and I used to bowl 20 overs a game for Bognor I never thought about how I was going to bowl I just ran up and Bowled, I never had good coaching I just watched and learned. I never really had to develop it just developed without me trying to develop it, I just practiced, It just came which was quite lucky.

Can you elaborate on the theme of 'thinking about your bowling' ?

Yeah, I tried to change different things, tried to get more square on, tried to change my run up and before I just used to walk back fifteen yards and just run up and bowled the darn thing. It just went and now it doesn't. It's going to again though I'm positive about that. I'm going to this season do well.

What makes you believe ?

Because I know that I can (change of tone). I know I've done it before and stuff it I must not worry about what other people are thinking. If I bowl one wide per over but I get a wicket so who cares, I should just bowl the darn thing and if I'm having problems just keep and push through but the thing was....you said on reflection, on reflection I think, I thought about this allot there were two clubs one was called debiers one was called huffey park, and huffey park didn't have an opening bowler, all right, debiers had two ,....and when we were a strong team, and often I used to bowl and I had just come back from Bognor bowling 20 overs per game. So I was in real big rhythm got to debiers park and never bowled that much. If I had gone to Huffey park I would have bowled every game and I

would have bowled 10-15 overs and maintained that rhythm I think that I am a rhythm bowler. And I need to bowl allot, allot, allot to actually get stuck into something to stuck into a rhythm. Not having bowled for a while I've lost it completely. I think that because when I went to university at Port Elizabeth I got into a rhythm again and Macca used to help me and I used to Bowl, Bowl, Bowl, Bowl, Bowl. And it just came again.

And you bowled for how long ?

I started off badly in the first season and then we had a break cos we have winter in June/July and I started again in September and then it started, we had really good winter nets and I used to practice everyday and it came back together and I used to open the bowling and I used to just bowl, bowl, bowl, bowl, bowl. and get wickets so I don't know.

So where has it gone wrong since then ?

Rhythm.

The next season ?

The next season it just disappeared again I don't know why, that's just a theory of mine that maybe it is a lack of rhythm because if I had stayed at huffey park I may have maintained it, yeah.

Can you expand on this theme of 'changing rhythm', is it a physical change ?

Definitely because it does feel strange, I can feel that its not in but I can stand back at my mark and I can picture myself bowling like I used to and yet I run up and I feel not the same.

Can you elaborate on how your rhythm should feel?

15 yards jogging in last few yards I step it up last five I step it up and then just before the delivery stride a do a little jump I jump into the air land with my right leg square on and my left foot actually digs a hole as it pulls me over comming over watching where you are going to deliver the ball and coming across, but this foot and I don't think I do it anymore used to dig a hole so that I could come over quicker and it doesn't do that anymore, maybe that is something, maybe I'm thinking to much about where I should be bowling and not just bowling it..

Can you elaborate on how your rhythm should feels when it is not going well?

It feels a little bit low I don't feel as if I'm jumping maybe or as if I've got no spring. It's the wrist the wrist feels as if it is moving across. The ball feels slippery (emphasises, change of tone) the ball really does I get a .....when I get thrown the ball....you'll think this is crazy, it feels as if I can't hold the thing my hands feel slippery my hands are feeling slippery now just thinking about it those two fingers and my thumb.

Can you elaborate on your hands feeling slippery, do you think they really are slippery ?

No, it's a mental thing, that my hands just feel, you can't hold this ball how are you going to bowl this straight if you can't hold this ball. And you should see my hands when I come off the field they are black because I rub them in dirt all the time. I come off and my hands are just caked in mud. That's when I'm trying to bowl. No chance of bowling straight, so I get some ground and I rub it in and it makes it kind of sticky.

Is it actually slippery ?

Yeah more than likely my hands are sweating, yet when I was bowling well, I used to think about this I used to bowl in 35 0c heat and I used to sweat, my hands would be dripping and yet I could bowl the ball, so a little bit of sweat shouldn't stop me from bowling the ball. Christ knows I wish I knew, and your going to have to sort me out

The Self-consciousness Scale

	Extremely Uncharacteristic				Extremely Characteristic
1. I am always trying to figure myself out.	0	1	2	3	4
2. I am concerned about my style of doing things.	0	1	2	3	4
3. Generally I am not very aware of myself.	0	1	2	3	4
4. It takes me time to overcome my shyness in new situations.	0	1	2	3	4
5. I reflect about myself allot.	0	1	2	3	4
6. I am concerned about the way I present myself.	0	1	2	3	4
7. I am often the subject of my own fantasies.	0	1	2	3	4
8. I have trouble working when someone is watching me.	0	1	2	3	4
9. I never scrutinise myself.	0	1	2	3	4
10. I get embarrassed very easily.	0	1	2	3	4
11. I am self conscious about the way I look.	0	1	2	3	4
12. I don't find it hard to talk to strangers.	0	1	2	3	4
13. I am generally attentive to my inner feelings.	0	1	2	3	4
14. I usually worry about making a good impression.	0	1	2	3	4
15. I am constantly examining my motives.	0	1	2	3	4
16. I feel anxious when I speak in front of a group.	0	1	2	3	4
17. One of the last things I do before leaving the house is look in the mirror.	0	1	2	3	4
18. I sometimes have the feeling that I am off somewhere watching myself.	0	1	2	3	4
19. I am concerned about what other people think of me.	0	1	2	3	4
20. I am alert to changes in my mood.	0	1	2	3	4
21. I am usually aware of my appearance.	0	1	2	3	4
22. I am aware of the way that my mind works when I work through a problem.	0	1	2	3	4
23. Large groups make me nervous.	0	1	2	3	4

Appendix 6

The Practical Assessment Questionnaire

Practical Assessment Questionnaire

Name :

1. How did you feel during the performance ?

2. What were you thinking during the performance ?

3. Were there any outside thoughts distracting you ?

4. Did you use the key word in your pre-putting routine ?

5. Did you experience any problems ?

6. Were you satisfied with the results following the intervention ?

7. What were your general beliefs about your performance ?

8. How much effort did you put into your performance ?

Appendix 7

The Anxiety Rating Scale

Anxiety Rating Scale

Name : **Condition :**

I feel nervous, my body feels tight and/or my stomach tense :

1. Not at all
2. A little bit
3. Somewhat
4. Moderately so
5. Quite a bit
6. Very much so
7. Intensely so

I feel concerned about performing poorly and that others will be disappointed with my performance.

1. Not at all
2. A little bit
3. Somewhat
4. Moderately so
5. Quite a bit
6. Very much so
7. Intensely so

I feel secure, mentally relaxed, and confident of coming through under pressure.

1. Not at all
2. A little bit
3. Somewhat
4. Moderately so
5. Quite a bit
6. Very much so
7. Intensely so

Appendix 8

The Reinvestment Scale

The Reinvestment Scale

Name : **Age :**

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

Appendix 9

Imagery Instructions

Imagery Instructions : External Imagery

Take note of these Imagery guidelines to help you develop the skill more quickly :

(a) imaging the execution of the putt and the outcome (ball going in the hole)

(b) the more vivid and the more detailed you can make the image the better

(c) image the skill it occurs on the video

(d) only see yourself perform the skill do not feel it

(e) practice the imagery from an external perspective

(f) image the putt being performed successfully

(g) use imagery to strengthen the 'blueprint' of those aspects of your golf putting performed well

Imagery Instructions : Internal Imagery

Take note of these Imagery guidelines to help you develop the skill more quickly :

(a) image the execution of the putt and the outcome (the ball going in the hole).

(b) the more vivid and the more detailed one can make the image the better

(c) image the skill it occurs in real life (through your own eyes)

(d) see yourself perform the skill and feel the movements

(e) practice the imagery from an internal perspective

(f) image the putt being performed successfully

(g) use imagery to strengthen the 'blueprint' of those aspects of your golf putting performed well

Appendix 10

Competition Brief

COMPETITION PHASE BRIEF

You have now finished the learning phase of this study. For the next **25 putts** you will be in competition with the other **31 participants** in this study. The aim of the competition is simply to putt as many as you can. A new **scoring system** will be introduced which means that when you make a putt you will be given a point and for every putt that you miss a point will be taken away. After the completion of 25 putts you will be placed into a **league table**. This league table will be sent to you showing you how you performed in relation to the other participants in the study. This phase of the study will also be recorded by a **video camera,** which will be used to assess your putting technique. The participant that achieves the highest score will receive a **£25 prize**. Within the competition phase try and use the strategey (imagery) that you have used whilst learning the skill.

GOOD LUCK

Appendix 11

Vividness of Movement Imagery Questionnaire

Vividness of Movement Imagery Questionnaire

Name : Date :

Total Scores (a) Other : (b) Self : Total (a) + (b) :

Movement imagery refers to the ability to imagine a movement. The aim of this test is to determine the vividness of your movement imagery. The items of the test are designed to bring certain images to your mind. You are asked to rate the vividness of each item by reference to the 5 point scale. After each item, write the appropriate number in the box provided. The first box is for an image obtained watching somebody else and the second box is for an image obtained doing it yourself. Try to do each item separately, independently of how you may have done the other items. Complete all items obtained watching somebody else and then return to the beginning of the questionnaire and rate the image obtained doing it yourself. For all items please have your eyes **closed**.

Rating Scale : The image aroused by each item might be :

Perfectly clear and as vivid as normal vision	Rating 1
Clear and reasonably vivid	Rating 2
Moderately clear and vivid	Rating 3
Vague and dim	Rating 4
No image at all, you only 'know' that you are thinking of the skill	Rating 5

Think of each of the following acts, and classify the images according to the degree of clearness and vividness as shown on the Rating Scale.

	Watching somebody else	Doing it yourself
1. Standing		
2. Walking		
3. Running		
4. Jumping		
5. Reaching for something on tiptoe		
6. Drawing a circle on paper		
7. Kicking a stone		
8. Bending to pick up a coin		
9. Falling forwards		
10. Running up stairs		
11. Jumping sideways		
12. Slipping over backwards		
13. Catching a ball with two hands		
14. Throwing a stone into water		
15. Kicking a ball in the air		
16. Hitting the ball along the ground		
17. Running downhill		
18. Climbing over a high wall		
19. Sliding on ice		
20. Riding a bike		
21. Jumping into water		
22. Swinging on a rope		
23. Balancing on one leg		
24. Jumping off a high wall		

Appendix 12

Competitive State Anxiety Inventory -2

THE CSAI-2

	SECTION 1				SECTION 2						
	Not at all	Some-what	Moderat ely so	Very much so	Very negative		Unimportant				Very positive
I am concerned about this competition	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I feel nervous	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I feel at ease	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I have self doubts	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I feel jittery	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I feel comfortable	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I am concerned that I may not do as well in this competition as I could	1	2	3	4	-3	-2	-1	0	+1	+2	+3
My body feels tense	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I feel self-confident	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I am concerned about losing	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I feel tense in my stomach	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I feel secure	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I am concerned about choking under pressure	1	2	3	4	-3	-2	-1	0	+1	+2	+3
My body feels relaxed	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I am confident I can meet the challenge	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I am concerned about performing poorly	1	2	3	4	-3	-2	-1	0	+1	+2	+3
My heart is racing	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I'm confident about performing well	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I'm worried about reaching my goal	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I feel my stomach sinking	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I feel mentally relaxed	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I'm concerned that others will be disappointed with my performance	1	2	3	4	-3	-2	-1	0	+1	+2	+3
My hands are clammy	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I'm confident because I mentally picture myself reaching my goal	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I'm concerned I won't be able to concentrate	1	2	3	4	-3	-2	-1	0	+1	+2	+3
My body feels tight	1	2	3	4	-3	-2	-1	0	+1	+2	+3
I'm confident at coming through under pressure	1	2	3	4	-3	-2	-1	0	+1	+2	+3

Appendix 13

Imagery Log Book

Imagery Guidelines :

1) Image the execution of the putt and the outcome.

2) The more vivid and more detailed you can make the image the better.

3) Image the skill as it occurs on your video.

4) Always practice the imagery from the external perspective.

5) Image the putts being successful. Focus just on the visual image.

6) Use the image to strengthen the 'blue print' of a successful putting stroke.

7) Remember the 'quality' of your practice is more important than the 'quantity'.

Imagery Training – Week 1

- First session with the sport psychologist (watch video, have imagery session)
- At the end of the week have review session with psychologist to monitor your progress.

Observation of video & imagery practice.

- Record the number of times you observe your video per day.
- Record the number of times you image the video. Try and make ten individual putts per session (as on the video).
- Record the clarity of the image
- Record how successful the image was (did you make successful putts ?)
- Record to what extent the image was external (as you saw it on the video).

Scale (1 = poor / 5 = v.good)

	Observed Video (no. of times)	Imagery Session (no. of times)	Clarity of Imagery (1-5)	Successful Image (1-5)	External Image (1-5)
Day 1					
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Imagery Training – Week 2

- First session with the sport psychologist (have imagery session & establish key word)
- At the end of the week have review session with psychologist to monitor your progress.

Observation of video, imagery practice & establish key word.

- Record the number of times you observe your video per day.
- Record the number of times you image the video. Try and make ten individual putts per session (as on the video).
- Record the clarity of the image
- Record how successful the image was (did you make successful putts ?)
- Record to what extent the image was external (as you saw it on the video).
- Record whether you were able to use the key word whilst imaging.

Scale (1 = poor / 5 = v.good)

	Observed Video (no. of times)	Imagery Session (no. of times)	Clarity of Imagery (1-5)	Successful Image (1-5)	External Image (1-5)	Used key word with imagery
Day 1						
Day 2						
Day 3						
Day 4						
Day 5						
Day 6						
Day 7						

Imagery Training – Week 3

- First session with the sport psychologist (imagery session)
- At the end of the week have review session with psychologist to monitor your progress.

Imagery practice with key word.

- Record the number of times you image your putting. Try and make ten successful individual putts per session.
- Record the clarity of the image.
- Record how successful the image was (did you make successful putts ?)
- Record to what extent the image was external.
- Practice your actual putting stroke, include the key word into your pre-putting routine, record how it feels.

Scale (1 = poor / 5 = v.good)

	Imagery Session (no. of times)	Clarity of Imagery (1-5)	Successful Image (1-5)	External Image (1-5)	Used key word in pre-putting routine (1-5)
Day 1					
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Imagery Training – Week 4 (last week)

- First session with the sport psychologist (review progress)
- At the end of the week review the intervention phase.

Imagery, and pre-putting routine practice

- Record the quality of the imagery (clarity, successful, external).
- Practice your pre-putting routine using the key word as a natural part of your routine.
- Record the quality of your routine using the key word as a natural part of your routine.
- Record the level of confidence you have in your stroke being successful.

Scale (1 = poor / 5 = v.good)

	Imagery Session (Quality 1-5)	Pre-putting routine (no of times)	Pre-putting routine (quality 1-5)	Confidence in stroke (1-5)
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				

Appendix 14

Statistical Analysis for Study 2

Tests of Within-Subjects Effects - Study 2 - Conscious control Performance scores

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
CONDITIO	Sphericity Assumed	176.333	1	176.333	34.229	.000
	Greenhouse-Geisser	176.333	1.000	176.333	34.229	.000
	Huynh-Feldt	176.333	1.000	176.333	34.229	.000
	Lower-bound	176.333	1.000	176.333	34.229	.000
CONDITIO * SCON	Sphericity Assumed	5.333	1	5.333	1.035	.320
	Greenhouse-Geisser	5.333	1.000	5.333	1.035	.320
	Huynh-Feldt	5.333	1.000	5.333	1.035	.320
	Lower-bound	5.333	1.000	5.333	1.035	.320
Error(CONDITIO)	Sphericity Assumed	113.333	22	5.152		
	Greenhouse-Geisser	113.333	22.000	5.152		
	Huynh-Feldt	113.333	22.000	5.152		
	Lower-bound	113.333	22.000	5.152		

Test of within subject effects - Study 2 - conscious control

leasure: MEASURE_1
ransformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	31314.083	1	31314.083	4048.442	.000
SCON	6.750	1	6.750	.873	.360
Error	170.167	22	7.735		

Appendix 15

Statistical Analysis for Study 3

Tests of Within-Subjects Effects - Study 3 - Self confidence

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
PRESSURE	Sphericity Assumed	9.187	1	9.187	10.852	.003
	Greenhouse-Geisser	9.187	1.000	9.187	10.852	.003
	Huynh-Feldt	9.187	1.000	9.187	10.852	.003
	Lower-bound	9.187	1.000	9.187	10.852	.003
PRESSURE * SCON	Sphericity Assumed	4.687	1	4.687	5.537	.028
	Greenhouse-Geisser	4.687	1.000	4.687	5.537	.028
	Huynh-Feldt	4.687	1.000	4.687	5.537	.028
	Lower-bound	4.687	1.000	4.687	5.537	.028
Error(PRESSURE)	Sphericity Assumed	18.625	22	.847		
	Greenhouse-Geisser	18.625	22.000	.847		
	Huynh-Feldt	18.625	22.000	.847		
	Lower-bound	18.625	22.000	.847		

Tests of Between-Subjects Effects - Study 3 self-confidence

easure: MEASURE_1
ansformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1190.021	1	1190.021	738.344	.000
SCON	11.021	1	11.021	6.838	.016
Error	35.458	22	1.612		

Tests of Within-Subjects Effects - Study 3 Cognitive Anxiety

easure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
PRESSURE	Sphericity Assumed	6.021	1	6.021	5.529	.028
	Greenhouse-Geisser	6.021	1.000	6.021	5.529	.028
	Huynh-Feldt	6.021	1.000	6.021	5.529	.028
	Lower-bound	6.021	1.000	6.021	5.529	.028
PRESSURE * SCON	Sphericity Assumed	2.521	1	2.521	2.315	.142
	Greenhouse-Geisser	2.521	1.000	2.521	2.315	.142
	Huynh-Feldt	2.521	1.000	2.521	2.315	.142
	Lower-bound	2.521	1.000	2.521	2.315	.142
Error(PRESSURE)	Sphericity Assumed	23.958	22	1.089		
	Greenhouse-Geisser	23.958	22.000	1.089		
	Huynh-Feldt	23.958	22.000	1.089		
	Lower-bound	23.958	22.000	1.089		

Tests of Between-Subjects Effects - Study 3 - Cognitive Anxiety

easure: MEASURE_1
ransformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	487.687	1	487.687	354.194	.000
SCON	2.521	1	2.521	1.831	.190
Error	30.292	22	1.377		

Tests of Within-Subjects Effects - Anova for study 3 somatic anxiety scores

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
PRESSURE	Sphericity Assumed	1.021	1	1.021	1.571	.223
	Greenhouse-Geisser	1.021	1.000	1.021	1.571	.223
	Huynh-Feldt	1.021	1.000	1.021	1.571	.223
	Lower-bound	1.021	1.000	1.021	1.571	.223
PRESSURE * SCON	Sphericity Assumed	.187	1	.187	.289	.596
	Greenhouse-Geisser	.187	1.000	.187	.289	.596
	Huynh-Feldt	.187	1.000	.187	.289	.596
	Lower-bound	.187	1.000	.187	.289	.596
Error(PRESSURE)	Sphericity Assumed	14.292	22	.650		
	Greenhouse-Geisser	14.292	22.000	.650		
	Huynh-Feldt	14.292	22.000	.650		
	Lower-bound	14.292	22.000	.650		

Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	165.021	1	165.021	159.289	.000
SCON	1.687	1	1.687	1.629	.215
Error	22.792	22	1.036		

		Paired Differences					
					95% Confidence Interval of the Difference		
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t
Pair 1	LPHS - HPHS	6.2500	3.3878	.9780	4.0975	8.4025	6.391
Pair 2	LPLS - HPLS	3.6667	3.6013	1.0396	1.3785	5.9549	3.527
Pair 3	LPLS - LPHS	-1.7500	5.1368	1.4829	-5.0137	1.5137	-1.180
Pair 4	HPLS - HPHS	.8333	4.5092	1.3017	-2.0317	3.6984	.640

Paired Samples Test - Study 3 Performance scores

		df	Sig. (2-tailed)
Pair 1	LPHS - HPHS	11	.000
Pair 2	LPLS - HPLS	11	.005
Pair 3	LPLS - LPHS	11	.263
Pair 4	HPLS - HPHS	11	.535

Tests of Within-Subjects Effects - Anova for study 3 performance scores

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
PRESSURE	Sphericity Assumed	295.021	1	295.021	45.454	.000
	Greenhouse-Geisser	295.021	1.000	295.021	45.454	.000
	Huynh-Feldt	295.021	1.000	295.021	45.454	.000
	Lower-bound	295.021	1.000	295.021	45.454	.000
PRESSURE * SCON	Sphericity Assumed	31.688	1	31.688	4.882	.038
	Greenhouse-Geisser	31.688	1.000	31.688	4.882	.038
	Huynh-Feldt	31.688	1.000	31.688	4.882	.038
	Lower-bound	31.688	1.000	31.688	4.882	.038
Error(PRESSURE)	Sphericity Assumed	142.792	22	6.491		
	Greenhouse-Geisser	142.792	22.000	6.491		
	Huynh-Feldt	142.792	22.000	6.491		
	Lower-bound	142.792	22.000	6.491		

Tests of Between-Subjects Effects Anova for study 3 performance scores

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	33232.687	1	33232.687	2400.063	.000
SCON	.187	1	.187	.014	.908
Error	304.625	22	13.847		

Appendix 16

Statistical Analysis for Study 4

Dependent Variable: SCORE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1.250[a]	3	.417	.413	.745
Intercept	312.500	1	312.500	309.735	.000
RINVEST	.000	1	.000	.000	1.000
IMAGERY	1.125	1	1.125	1.115	.300
RINVEST * IMAGERY	.125	1	.125	.124	.727
Error	28.250	28	1.009		
Total	342.000	32			
Corrected Total	29.500	31			

a. R Squared = .042 (Adjusted R Squared = -.060)

Tests of Between-Subjects Effects - Cognitve anxiety - Study 4

Dependent Variable: CANXIETY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7.375[a]	3	2.458	2.055	.129
Intercept	325.125	1	325.125	271.746	.000
REIVEST	6.125	1	6.125	5.119	.032
IMAGERY	.125	1	.125	.104	.749
REIVEST * IMAGERY	1.125	1	1.125	.940	.341
Error	33.500	28	1.196		
Total	366.000	32			
Corrected Total	40.875	31			

a. R Squared = .180 (Adjusted R Squared = .093)

Tests of Between-Subjects Effects - Self confidence - Study 4

Dependent Variable: SCORE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1.625[a]	3	.542	.456	.715
Intercept	465.125	1	465.125	391.684	.000
REINVEST	.500	1	.500	.421	.522
IMAGERY	1.125	1	1.125	.947	.339
REINVEST * IMAGERY	.000	1	.000	.000	1.000
Error	33.250	28	1.188		
Total	500.000	32			
Corrected Total	34.875	31			

a. R Squared = .047 (Adjusted R Squared = -.056)

		Paired Differences					
					95% Confidence Interval of the Difference		
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t
Pair 1	HIEXT - HIINT	4.7500	4.2003	1.4850	1.2384	8.2616	3.199
Pair 2	HIEXT - LOWEXT	.2500	2.1213	.7500	-1.5235	2.0235	.333
Pair 3	HIEXT - LOWINT	1.2500	3.4122	1.2064	-1.6026	4.1026	1.036
Pair 4	HIINT - LOWEXT	-4.5000	3.7033	1.3093	-7.5960	-1.4040	-3.437
Pair 5	HIINT - LOWINT	-3.5000	5.9281	2.0959	-8.4561	1.4561	-1.670
Pair 6	LOWEXT - LOWINT	1.0000	3.4641	1.2247	-1.8961	3.8961	.816

Paired Samples Test - Performance scores - Reinvestment study 4

		df	Sig. (2-tailed)
Pair 1	HIEXT - HIINT	7	.015
Pair 2	HIEXT - LOWEXT	7	.749
Pair 3	HIEXT - LOWINT	7	.335
Pair 4	HIINT - LOWEXT	7	.011
Pair 5	HIINT - LOWINT	7	.139
Pair 6	LOWEXT - LOWINT	7	.441

SCORE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.094	3	1.365	.057	.982
Within Groups	669.125	28	23.897		
Total	673.219	31			

Tests of Between-Subjects Effects - Performance scores - Reinvestment Study

Dependent Variable: SCORE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	122.000[b]	3	40.667	6.397	.002
Intercept	8712.000	1	8712.000	1370.427	.000
REINVEST	18.000	1	18.000	2.831	.104
IMAGERY	72.000	1	72.000	11.326	.002
REINVEST * IMAGERY	32.000	1	32.000	5.034	.033
Error	178.000	28	6.357		
Total	9012.000	32			
Corrected Total	300.000	31			

Tests of Between-Subjects Effects - Performance scores - Reinvestment Study

Dependent Variable: SCORE

Source	Noncent. Parameter	Observed Power[a]
Corrected Model	19.191	.943
Intercept	1370.427	1.000
REINVEST	2.831	.369
IMAGERY	11.326	.901
REINVEST * IMAGERY	5.034	.582
Error		
Total		
Corrected Total		

a. Computed using alpha = .05

b. R Squared = .407 (Adjusted R Squared = .343)