DOCTOR OF PHILOSOPHY

Goal-setting : a psychological skill and an individual difference factor.

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To Mum & Dad

Goal-setting : A psychological skill and an individual difference factor

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Acknowledgements

This work and all which preceded it is dedicated to two people without whose love and support none of this would have been possible: Mum, your propensity to give unconditionally never ceases to amaze me, and leaves me totally in awe of your love and compassion; and Dad, when times are tough it's reassuring to know that your broad shoulders are always there to help lighten the load. I love you both with all my heart.

A great deal of water has passed under the bridge since completing my undergraduate degree and realising that had a genuine desire to become involved with sport psychology as an academic and professional pursuit. From my early fumblings working with student athletes, and my rather bullish approach to the teaching process, I'd like to believe that I am developing into a highly effective researcher, counsellor and educator. This realisation of my dreams has only been possible because of a large number of people who have made varied and valuable contributions to my life. Although it is not possible to mention you all, I'd like to thank a few explicitly, and hope that the rest will believe me when I say, 'thanks for everything'.

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Summary of Thesis

This thesis comprises a collection of research papers within the areas of goal-setting as a psychological skill, and as an individual difference factor (previously interpreted as a personality characteristic). It uses a variety of methodologies and statistical analyses to address pertinent research questions identified from the goal-setting and goal perspectives literature.

The first two studies examined the influence of goal-setting practices on performance and associated cognitions. Specifically, the results from the first study provide support for the use of self-referenced goals, while indicating that process goals have additional benefits over and above those associated with performance goals. The second study into goal-setting suggested that utilising process goals in a more holistic (rather than specific) manner might prove efficacious when they are incorporated into a pre-performance routine. Although the findings providing some support for the use of process goals, it appears that the exact nature of the process goals used is important. The remaining three research studies looked at the propensity of individuals to judge personal ability according to normative and/or self-referenced criteria (ego and task goal orientations). The first study in this area suggested that these criteria change in a systematic fashion in response to naturally occurring situations, and that ability level moderates this effect. The results of the second study indicated that competition performance is differentially affected according to the specific goal orientation profile that athletes hold. The third research study provides evidence which suggests that skill level might be predicted according to the patterning of goal orientations possessed by athletes.

PAGINATION AS IN ORIGINAL

Chapter 1

Introduction

Purpose of the Research Project

This thesis includes research from two distinct theoretical domains; goal setting as a psychological skill (including the incorporation of goals into pre-performance routines); and goals as an individual difference variable. The primary purpose is to address the research issues that are highlighted in the opening critique. Secondly, an attempt is made to provide theoretical links between the findings from these domains using a number of key points. Furthermore, it is hoped that the variety of designs, methodological approaches, and statistical analyses used will encourage other researchers to use a wider variety of methods to more effectively address research questions within these areas.

Structure of the Thesis

The thesis is written as a collection of research papers. In broad terms, it comprises of: a critique of the literature on goals and goal-setting; five discrete research studies; and a general discussion. It contains eight chapters. Chapter one (the introduction) is divided into three parts. The first part contains a brief summary of the research undertaken, the second part discusses the purpose of the thesis, and the third provides an overview of the make-up of the thesis together with a brief philosophical discussion of the thesis as a vessel for research training. The second chapter is a critique of the current literature pertaining to goal setting as a psychological skill (including pre-performance goals) and goal orientations as an individual difference factor. Within this critique, a number of research issues are highlighted, and these form the basis of the individual research studies which make up the empirical part of the thesis. Chapter three specifically examines the impact of a year-long intervention comparing

the efficacy of self-referenced process goals and performance goals on a sample of club golfers. Chapter four is designed to develop the use of process goals by high level performers through a case-study of a pre-performance routine training programme. Chapters five, six and seven examine individual goal perspectives. Specifically, chapter five attempts to assess the stability of (so called) dispositional goal orientations and determine whether they change in a systematic fashion according to perceptions of different situations. Chapter six examines the impact of goal orientation profiles on competition performance, and chapter seven examines whether dispositional goal orientations can be used to predict ability levels. The final chapter (eight) firstly draws together the empirical findings from each of the individual research papers and relates them to the current empirical base. Secondly, it discusses the practical implications of the findings from the empirical studies. Thirdly, it identifies some of the strengths and limitations of the thesis, before making suggestions for future research on the basis of the thesis' findings.

The current thesis differs from traditional PhD theses. It was agreed with the supervisor that the purpose of writing a thesis was to provide research training, rather than to simply demonstrate in-depth expertise in a single, relatively narrow research area. Consequently, this thesis comprises of a number of distinct research studies linked to a greater or lesser extent by the introduction and general discussion. The benefits to this approach are that it enables the candidate to engage in studies using a variety of methodological approaches, and to explore the data produced with a variety of statistical analyses. Furthermore, it was felt that conducting research in a number of different domains would provide a broader context within which to discuss each of the individual research questions, thereby leading to a more integrated approach to the research undertaken.

Chapter 2

General introduction

Introduction

Research in the area of goal-setting as a psychological skill was initiated within the realms of organisational psychology, and has often involved some sort of time and motion based criterion for success. The basic principles obtained from research in such domains have been increasingly applied to the sporting environment. However, the transfer has not always been smooth, and hence a number of methodological and theoretical explanations have been forwarded to account for this equivocation. One purpose of this introduction is to provide a brief critique of part of the current goal-setting literature. In order to achieve this objective, specific parts of the literature will be highlighted. From this discussion pertinent research questions/issues are identified that require further attention, and these form the substantive portion of the thesis.

Goals as a motivational tool

Locke's (1968) goal 'theory' stimulated a considerable number of studies into the effects of formalised goals in industrial and organisational settings. The principle components of Locke's theory have, more recently, been applied and tested within the sport and exercise domain.

In a review of both laboratory and field studies into the effects of goals on task performance, Locke, Shaw, Saari and Latham (1981) found that 90% of the 110 studies reviewed supported the major tenets of goal theory and further, identified the existence of highly generalisable, positive performance effects. Meanwhile, however, Tubbs' (1986) meta-

analytic examination of goal theory contended that, while the results from well-controlled studies were supportive of goal-theory, method variance had potential for moderating the results. Specifically, he suggested that variations in the environment in which the study took place, together with a number of factors relating to the way in which goals were operationalised might confound the results (e.g. assignment of goals, feedback, goal types, and goal level).

In spite of the well documented (and researched) principles that are purported to lead to effective goal-setting practices in the realm of sport and exercise (see, e.g. Beggs, 1990; Locke & Latham, 1985), controlled research studies have not always replicated the consistently strong effects found elsewhere. Moreover, field studies in the realm of sport have further brought into question the transferability of goal-setting findings from laboratory, industrial, and organisational settings to sport. A number of sport psychology researchers have debated the reasons behind this lack of transfer (e.g. Hall & Byrne, 1988; Locke, 1991;1994; Weinberg & Weigand, 1993; 1996). In doing so, they proposed a number of methodological-based explanations which can be broadly categorised into four areas: spontaneous goal-setting by control subjects; the nature of the task; motivation and commitment of the subjects; and competition (cf. Weinberg, 1992). It is perhaps important to acknowledge that the nature of sport participants, the complexities of sport related tasks, and the inherently competitive nature of sporting situations, might exacerbate any potential methodological confounds.

Different types of goals

At least three different types of goals have been identified in the literature (Hardy & Nelson, 1988; Hardy & Jones, 1994). Outcome goals focus on the outcomes of a particular event and are based on social comparison processes (for example, winning a race).

Performance goals also specify the products of task performance, but success is viewed according to the attainment of self-referenced performance standards (for example, a time or score to achieve). Process goals focus on behavioural or cognitive aspects of the task that are perceived to influence/determine performance (for example, relaxing prior to shot execution) as opposed to a measureable 'product' of performance.

Goal-setting training

A specific line of research which has attempted to provide support for the use of goal-setting in applied sport settings is that which examines the impact of formalised goal-setting training programmes on cognitions and performance. Early empirical and anecdotal reports sought to establish whether positive performance and affective states were more readily elicited as a result of setting self-referenced performance goals. Part of the argument for the hypothesised positive effects of performance goals revolved around the suggestion that outcome goals lack the flexibility to provide optimal levels of challenge. Furthermore, regardless of the quality of their performance, athletes can exert only minimal control over social comparison based goals (Burton, 1989).

A study regarded as something of a benchmark in this area was carried out by Burton (1989). Burton examined the effects of a goal setting training (GST) programme on the performance and cognitions of a group of collegiate swimmers. The principal focus of the GST programme was to teach the swimmers to set performance goals (in contrast to the outcome goals they were perceived to be using), and to follow a number of basic principles associated with effective goal-setting (for example, to set specific, short-term goals in pursuit of longer-term objectives). While the comparison group in this study were not explicitly encouraged to set outcome goals, Burton reasoned that those who did not receive GST would maintain a focus on outcome goals in competitive situations. The results suggested that the

GST had been successful in modifying goal-setting practices, and in addition to enhancing perceived ability and competitive cognitions, elicited improvements in performance (Burton, 1989). Further GST studies have provided both positive (Anderson, Crowell, Doman & Howard, 1988) and non-significant performance effects (Miller & McAuley, 1987; and Weinberg, Stitcher & Richardson, 1994). Nevertheless, a number of prominent researchers have argued in favour of the relative efficacy of performance goals over outcome goals (e.g. Burton, 1992; Duda, 1992; Gould, 1993; Orlick, 1986), and as a consequence sports performers are normally encouraged to set performance goals.

Issue 1: Performers should be encouraged to set performance rather than outcome goals

While the arguments for the importance of setting self-referenced performance goals are logical (if not entirely substantiated), they often fail to acknowledge the important role that outcome based goals may have for some performers. Indeed, anecdotal reports from coaches and professional consultancy indicate that outcome goals may have a very strong motivational role particularly through arduous training regimens and following setbacks, e.g. those caused by injury (Hardy, Jones & Gould, 1996).

In an attempt to shed some light on the issue of transferability to the sports context, Beggs (1990), reviewed the relationship between goal-setting and competitive anxiety. Within the review, he suggested that while goal-setting remained a valuable tool for sports performers, it may be something of a 'double-edged sword'. He surmised that even performance goals may elicit stress because they are important, require action, and may not always be achieved. Indeed, as one strives to achieve a performance goal, it may itself become a source of anxiety. For example, in their examination of the situational antecedents of state anxiety in a sample of elite middle distance runners, Jones, Swain and Cale (1990) found that more difficult self-referenced pre-race goals and lower expectations of success

were correlated with high cognitive anxiety and low self-confidence. Clearly, this finding does not sit comfortably with the suggestion of Burton's (1992) competitive goal-setting model that performance goals are unlikely to lead to anxiety, poor performance and/or a reduction in motivation. Bearing these differences in mind, it might be reasonable to suggest that the equivocal nature of the findings of goal-setting research in sport could be attributed to performers not being asked to set the most appropriate types of goals.

The implications of Beggs' summation and the studies which have supported it indicate that under some circumstances self-referenced performance goals can become a source of stress. According to cognitive evaluation theory (Deci & Ryan, 1985), individuals have an innate need to feel competent and self-determining. When performers perceive the goals they have set to be controlling (rather than facilitating) their actions, their self-determination may be diminished. Consequently, such performance goals can have all the negative motivational consequences that have been argued to be associated with outcome goals (Hardy, Jones & Gould, 1996a).

It seems reasonable to suggest that the majority of athletes engage in multiple goal-setting practices (see Jones & Hanton, 1996), and therefore the selection of goals may need to be carefully tailored to the preferences of athletes and the situational demands currently operable in order to elicit consistently positive effects. While there is some promise in work which attempts to explain the mechanisms of effects of outcome and performance goals on sports performance (Burton, 1989), an issue that has received scant attention is the salience (to the performer) of the goals that have actually been allocated in research studies.

It is the contention of the present author that different types of goals have very specific benefits (and perhaps shortcomings) within the framework of preparation for and execution of sport skills. In short, it has been suggested that while outcome goals may have a

strong motivational value, they may have a negative effect on persistence (Roberts, 1986), and competitive anxiety (Burton, 1988). Self-referenced performance goals, while reportedly positively effecting performance and cognitions (e.g. Burton, 1992; Duda, 1992; Gould, 1993; Orlick, 1986), may lead to negative consequences when they are in doubt (Beggs, 1990; Hardy, et al., 1996a). Finally, the single empirical study published prior to this thesis has provided only tentative support (Kingston, Hardy & Markland, 1992) for the use of process oriented goals. It has been suggested that process goals, while having limited motivational value, may exert their influence upon performance via the allocation of attentional resources (Hardy & Nelson, 1988; Hardy & Jones, 1994).

The above paragraph highlights the importance of setting goals that are appropriate for the demands of the situation. The review has highlighted support for the efficacy of performance goals, and has provided substantial anecdotal support for the value of outcome goals (in spite of their general derogation within the literature; see, for example, Duda, 1992), most notably in performers of high ability. However, since there are also potential limitations with setting performance based goals in competitive settings, research is needed which examines the potential benefits of other types of goals in competitive situations. As mentioned, one of the purported benefits of setting process goals is their use as an attentional aiding strategy, it is reasonable therefore to examine their impact. The ability of the performer to exert almost complete control over process goals, and the fact that they are based on process rather than a product of the task performance renders them less likely to act as further stressors in competitive situations.

Research question 1: Are process goals more effective than performance goals in competitive (stressful) situations?

Process oriented goals as an integral component of pre-performance routines

The potential for negative effects to be associated with both outcome and performance goals in competition implies that the use of process goals (i.e. those which focus on cognitions and/or behaviours that are perceived to elicit effective task execution) may incur some beneficial effects. There exists, however, something of a paradox with regards to process goals. Focusing attention on a specific aspect of technique (whether cognitive or behavioural), might disrupt the smooth execution of the skill (Masters, 1992). The reasoning behind this disruptive effect is that process goals (in their basic form) may cause attention to be focused on an aspect of the skill that might otherwise be performed automatically, thereby leading to attempts to consciously control movements. Unsurprisingly, this is only really an issue for relatively high level performers who, as a consequence of extensive practice, perform well-learned tasks automatically with no recourse to conscious control.

Holistic process goals According to Hardy, Mullen & Jones (1996b), one way around this apparent paradox may be to encourage the use of pre-performance routines which incorporate holistic process goals. Performance routines typically incorporate a set of specific well-learned single process goals that become grouped or 'chunked' together. Holistic process goals are essentially a single cue word, thought, or action that refers to a holistic characteristic of the movement as opposed to a single part. Examples of holistic process goals in golf include, "tempo", "smooth", "long". Goals of an holistic nature should preserve the chunking process which is thought to be an integral part of automaticity (Fitts & Posner, 1967).

Issue 2: Pre-performance routines using holistic process goals are a natural progression from single process goals

The conscious processing hypothesis (Baumeister, 1984; Masters, 1992; Hardy, et al., 1996b) suggests that when athletes become anxious they regress to relatively crude

'conscious' control strategies (such as explicit rules), which cause decrements in performance. Utilising holistic process goals may reduce the tendency of anxious performers to lapse into conscious control (Hardy et al., 1996b), because they make no reference to parts of the movement which would encourage de-chunking. It is logical to propose that any cue (word, thought, or action) being used to initiate an automated action should reinforce rather than compromise the holistic nature of that action. Therefore, holistic process goals appear to be an ideal primary focus for pre-performance routines. Hardy et al. (1996a) formalised this link between process oriented goals and performance routines in suggesting that, such goals may form part of the strategy for technique development that might lead to the eventual automation of performance. In essence their inference is that a holistic cue should form part of the routine.

The introduction to chapter 4 provides a detailed discussion which suggests that there is general, if not unequivocal, support for the use of pre-performance routines. Studies of the use of pre-performance routines in golf can be distinguished according to the level of ability of the subjects involved. Crews and Boutcher (1986) argue that skill level differences may discriminate those who realise positive performance effects from pre-performance routine training. Therefore, it is logical to suggest that one reason for the equivocal findings with regards to the efficacy of pre-performance routines is that they may not always have been tailored to the skill level (or specific requirements) of the participants. Indeed, it may be that less-skilled performers could benefit from the increased control achieved through using single process goals (because their skills are not yet automated), while those who have already mastered the basic skills may be best served by developing routines which emphasise a more holistic representation of the movement (to reduce the tendency to regress to crude methods of control when under stress). Consequently, it would be interesting to match pre-

performance routines to the specific needs of individual clients and monitor their effects accordingly.

Research question 2: What is the impact on a highly skilled performer of a pre-performance routine training programme which incorporates the use of holistic process goals?

Part two: Goals as an individual difference factor

The cognitive mechanistic approach to goals which evolved from the work of industrial and organisational psychologists (e.g. Lock, Latham and associates), contends that, for any given situation, "...goals are immediate regulators of human action" (Weinberg, 1992, p.182), and function like a psychological state. Such goals serve to provide a specific focus for behaviour that provides the individual with a direction for their actions. Within this context, different goals have been labelled according to their primary focus, for example outcome and performance goals (Burton, 1989). Contemporary motivation theorists, (e.g. Nicholls, Duda, Dweck, Roberts and their associates) on the other hand, suggest that goals are like personality traits, implying dispositional motives for what the individual wants to aim or accomplish. In essence, goals relate to how the individual construes his or her level of ability, and reflect the personal meaning of achievement to the athlete (Treasure, 1997; Hall, Kerr & Matthews, 1998).

Burton's (1992) competitive goal setting model has attempted to integrate these two conceptions of goals. Accordingly, he argues that the discrete state goals an individual sets may be the tools for achieving (satisfying) more global goal orientations (Burton, 1992). While Burton's model could be criticised for being somewhat simplistic in it's interpretation

of the previously discussed conceptions of ability, it does provide a convenient framework on which to base studies examining state goals and their dispositional antecedents.

Goal perspectives

Nicholls (1989), suggests that the nature of achievement goals (discrete goals set in achievement settings) pursued by individuals are based on an implicit need to maintain favourable conceptions of ability. According to goal perspective theory (Nicholls, 1989;1992) there are two major goal perspectives operating in achievement settings, and it is these that determine the criteria by which individuals conceptualise ability. According to Duda (1992), an ego involved perspective exists when an individual construes subjective success by comparing their own ability with that of others. A task involved perspective is held when subjective success is based upon self-referenced improvements in performance or on mastery of the task (Duda, 1992). An individual's goal orientation refers to their predisposing tendency to be task and/or ego involved in achievement situations.

Measurement of goal orientations

Adapted from a measure of dispositional goal perspectives in classroom settings, Duda & Nicholls (1992) developed the task and ego orientation in sports questionnaire (TEOSQ). The TEOSQ is a 13-item, two-factor inventory measuring individuals' proneness for task and ego involvement in the athletic context (see appendix 1). The two-factor structure of the TEOSQ has been found to be stable, with two internally consistent, orthogonal factors. The independence of these factors has been supported in studies of both elite and non-elite sport participants (Duda & White, 1992). Evidence of acceptable test-retest reliability and internal consistency has also been provided in previous studies (see Duda, 1992; Duda & Whitehead, 1998).

Issue 3: Goal orientations as measured using TEOSQ are situationally consistent

When the task and ego orientation in sport questionnaire (TEOSQ) is administered in relatively stable environments (for example in physical education classes), it is not surprising that variations in conceptualisations of ability are negligible. However, the multifaceted nature of competitive sport clearly provides numerous opportunities for performers to alter their own particular conceptualisations of ability according to the specific situational peculiarities. They may, in some cases fluctuate from having a predominantly self-referenced based criterion for judging success, to one where social comparison processes provide the central framework through which competencies are judged. Furthermore, if TEOSQ is to be meaningfully utilised for diagnostic purposes, it is important that researchers gain a further understanding of the extent to which athletes' conceptualisations of ability (goal orientations) change in a systematic fashion across different, yet naturally occurring, situations. In addition to the dispositional factors that might moderate the effect of situational factors on goal orientations, the overall ability level of the performer might impinge on individual tendencies to favour differing reference points for judging personal competencies. Despite the emphasis that much of the goal perspectives literature places on reducing high levels of ego orientation (e.g., Duda's 1992 review), it has also been suggested that higher level performers are most likely to possess simultaneously high levels of task and ego orientation (Fox, Goudas, Biddle, Duda & Armstrong, 1994; Jones & Hardy, 1990; Orlick & Partington, 1988; Hardy et al., 1996a). Since more able performers regularly demonstrate an ability to more effectively deal with the pressures of the competitive environment (Hardy et al., 1996), it is reasonable to expect that the profiles of elite performers will be less susceptible to situational variations. This may occur inspite of the fact that such athletes may continue to switch their states of involvement according to situational factors.

Nicholls (1989) indicated that the specific state goals that one adopts are a direct reflection of individual differences in proneness to be task or ego-involved (goal orientation). Dweck and Leggett (1988), however, argued that individual differences in the proneness to be task or ego involved together with the nature of the situation determine the probability of adopting certain goals, and displaying behaviours in relation to those goals. The state of involvement that an individual holds (which is manifested in the specific state goals that they set) is therefore a consequence of an interaction between dispositional goal orientations and the situation (see Burton, 1992; Duda, 1989; Swain & Harwood, 1996).

Although TEOSQ has been designed as a tool to measure dispositional tendencies, utilised in the manner described (to monitor fluctuations in goal orientations) it can provide a meaningful picture of the variations in the way in which performers conceptualise ability. Furthermore, when combined with a more detailed understanding of the person by situation interaction (which determines goal states), monitoring these variations may enable researchers and practitioners to be able to predict state goals that performers will adopt across different situations.

Research Question 3: Are dispositional goal orientations (in sport) stable, and does ability affect stability?

Goal orientations: The implications

According to goal perspectives theory (Nicholls, 1989), the degree to which an individual is task or ego oriented will impact on achievement cognition, affect and behaviour (Duda, 1992;1993; Roberts 1992). Hall and Kerr (1998), argue that, consistent evidence has been provided indicating that the endorsement of an ego orientation can negatively effect those variables in athletes. However, it is important to clarify here, that it is actually a high level of ego orientation combined with low perceptions of ability that has been shown to have

negative connotations, although goal perspectives researchers often fail to make explicit this important detail (see, for example, Duda, 1992; Duda & White, 1992; Newton & Duda, 1995; White & Zellner, 1996). Consequently, authors have often over-speculated that high levels of ego orientation per se have a negative effect.

Issue 4: High levels of ego orientation normally have a negative impact upon performance

Goal orientation profiles

The failure to acknowledge the importance of the actual levels of both task and ego orientations illustrates one of the principle criticisms of the goal perspectives literature. Researchers have often failed to consider the orthogonality, or independence of the two goal orientations when analysing their effects. Indeed, in all but a few studies this has been the case (Hardy, 1997; 1998). Barring these exceptions, researchers have generally reported and discussed only the main effects rather than the interactive effects of the goal orientations on the dependent variables under consideration. One primary reason for acknowledging the importance of the second goal orientation is that there may be some buffering against some of the effects associated with high levels of the first goal orientations. For example, Roberts, Treasure and Kavussanu (1996) have suggested that a high level of task orientation may protect against any detrimental effects of a high level of ego orientation.

As mentioned above, an important underpinning of goal perspectives research is that the two goal orientations are orthogonal (independent), implying that performers may be high (or low) on both task and ego orientation simultaneously (Hardy et al., 1996a). In light of the independence of these orientations, a recent advancement in goal perspectives research has been the utilisation of goal orientation 'profiles' (see, for example, Fox et al., 1994; Roberts et al., 1996; Walling & Duda, 1995). In their simplest forms, these profiles make use of the independent nature of task and ego orientations to categorise an individual into one of four

goal orientation sub-sets (high task/low ego, high task/high ego, low task/low ego and low task/high ego). The principle advantage with this approach is that it enables researchers to test hypotheses regarding the interactive effects of task and ego orientations using simple two-factor designs.

Are there benefits to a high level of ego orientation?

In spite of arguments to the contrary, the widespread derogation of a high level of ego orientation does not sit comfortably with anecdotal accounts from athletes and coaches (see Hemery, 1986; Orlick, 1986). Furthermore, less formal observations by applied sport psychology researchers and practitioners suggests that a strong desire to win (a defining characteristic of a high level of ego orientation) may be an important characteristic of elite performers (Hardy, 1997; Hardy et al., 1996a; Orlick & Partington, 1988). Preliminary research using the goal orientations approach suggests that, independent of the level of ego orientation, only low levels of task orientation have consistently negative consequences for performance (Roberts et al., 1996).

A plausible explanation for these findings is that simultaneously high levels of task and ego orientation may represent a highly adaptive goal orientation profile, especially for high level performers. A number of studies have provided support for the motivational and performance efficacy of simultaneously high levels of task and ego orientation (e.g., Brunel & Avanzini, 1997; Fox et al., 1994; Roberts et al., 1996). However, whilst these studies undoubtedly allow for inferences to performance, no direct evidence has been provided directly supporting positive performance effects. The negative effect of simultaneously low levels of task and ego orientations have also been reported (Fox et al., 1994; Walling & Duda, 1995). Given the findings reported above, it would clearly be of interest to determine the

effects (on performance) of each of the combinations of high and low levels of task and ego orientation.

Research question 4: To what extent does the patterning of goal orientation levels affect performance?

Skill levels and goal orientation profiles

Following the suggestions regarding adaptive and less adaptive goal orientation profiles, it might be inferred that high level performers can be characterised by having a generally more adaptive profile. Furthermore, more skilled performers presumably have at their disposal a substantial number of strategies which reduce their tendency to be affected by potentially distracting stimuli whether they be environmental or cognitive. Therefore, in addition to having more adaptive profiles per se, it is logical to assume that these adaptive profiles are robust across naturally occurring, yet different, situations. For example, a skilled athlete with a strong desire to win an event may be less inclined to focus on the outcome of the event immediately prior to the competition if he/she realises that in order to achieve this objective their primary focus must be on aspects of the skill described by a task orientation (i.e. they could be high in both ego and task orientation simultaneously). Conversely, a less able performer who has a strong task orientation and say a high level of ego orientation prior to a practice scenario, may under some circumstances compromise his/her strong task focus when they are involved in a competition by becoming preoccupied with thinking about the outcome in terms of social comparison. Therefore, in addition to establishing whether ability levels can be predicted by certain patterns of task and ego orientation levels, it is meaningful to establish the degree to which an athlete's tendency to conceptualise ability in a certain way remains consistent across a variety of situations.

Research question 5: Can ability be predicted as a function of task and ego orientation levels; and to what extent does this predictive ability vary according to the situation?

Chapter 3

Effects of Different Types of Goals Upon Processes that Support Performance

Abstract

Empirical studies attesting to the effectiveness of goal-setting in sport have been plagued by equivocation. Inconsistencies may relate to the issue of task/goal complexity and the types of goals that participants are asked to utilize in such studies (Hardy, Jones & Gould, 1996a). The current study addresses the second of these issues by determining the relative efficacy of two types of goal-setting training program which differ according to their primary focus (i.e., setting performance- or process-oriented goals). Thirty-seven club golfers divided into two training groups and a non-treatment control condition, completed the Competitive State Anxiety Inventory-2 on three occasions at important competitions, and the Sport Psychology Skills Questionnaire prior to, and upon completion, of the intervention. Ability was measured via golf handicap following the three competitions. Two factor (group X test) ANOVAs revealed a significant interaction ($p < .05$) for ability, indicating significant improvements from test 1 to test 2 for those trained in the use of process-oriented goal-setting, and significant improvements for the performance-oriented goal-setting training group between test 1 and test 3. The significant interactions ($p < .05$) for self-efficacy, cognitive anxiety control, and concentration, indicated positive effects for those in the process-oriented training group only. The findings testify to the efficacy of self-referenced goal-setting practices, and provide additional support for the utilisation of process goals in competitive situations.

Introduction

Locke's (1968) goal-setting theory has prompted a wide and varied set of studies, initially within industrial and organizational settings, and more recently in the realm of sport and exercise. The basic assumption of the theory is that goals serve as regulators of human action, and that specific challenging goals produce better performance than "do your best" or "no goal" conditions.

Tasks performed in industrial and organisational settings have much in common with sport activities, in that both can involve mental and physical action directed toward some end (Locke & Latham, 1985). Consequently, there is every reason to believe that goal-setting will work as well in the realm of sports as it does in more traditional work settings. This basic contention has led to a more systematic effort to study the effects of goal-setting in sport.

Despite arguments for the efficacy of goal-setting in the sports realm, and the use of increasingly controlled studies which also attempt to maintain a high degree of external validity, the literature relating to goal-setting and its effects within exercise and sports settings has been dogged by equivocation (see Beggs, 1990 and Weinberg, 1992 for comprehensive reviews). This has led to discussion and counter-argument (e.g., Locke, 1991, 1994 versus Weinberg & Weigand 1993, 1996) relating to methodological confounds, and differences in the nature of the tasks and the individuals studied in the two environments. According to Weinberg (1992), the transfer and testing of Locke and Latham's (1985) hypotheses to sport settings presents several methodological considerations and limitations: spontaneous goal-setting in control groups; differing task characteristics; motivation and commitment; and competition. The present study attempted to control for the effects of spontaneous goal-setting, motivation and competition, while examining the effects of two different goal-setting training programs upon performance of a complex task.

Examination of the empirical literature into the effects of goal-setting indicates that sport psychology researchers have predominantly studied single parameters of goals, such as goal-difficulty, specificity, and proximity. While from a logistical point of view this is sound practice, it may dilute the effects which might occur had these parameters been considered simultaneously, possibly as part of the implementation and the evaluations into the efficacy of goal-setting training programs. The use of longitudinal goal-setting training programs, and the evaluation of such programs has received surprisingly scant attention within the sports context. Furthermore, when these programs have been evaluated, their efficacy has remained somewhat contentious. For example, Burton (1989) conducted a field study with swimmers, and found that training participants in the use of performance goals led to modified goal-setting patterns, enhanced perceived ability and competitive cognitions, and improved performance (as indicated by swim times). Anderson, Crowell, Doman, and Howard (1988) utilized goal-setting as part of a psychological training package with field hockey players, and identified that it led to increased hit-rates; they also noted that these effects were superimposed on performance already enhanced by feedback (performance posting). Miller and McAuley (1987), and Weinberg, Stitcher and Richardson (1994), however, found no significant performance effects in their studies on basketball and lacrosse players respectively. Further examination of the above studies reveals that, although the only clear-cut performance effects occurred in Burton's study, the results from the other studies do at least provide some support for the effects of goal-setting training programs on performance and/or the processes that support performance. It is also noted that Burton's results may have to be treated with a degree of scepticism due to certain design limitations (e.g., the lack of an appropriate comparison group). Swain and Jones (1995) attempted to overcome the equivocal nature of previous studies by evaluating the effects of their goal-setting training program

upon performance via a single-subject, multiple-baseline design. They argued that this may be one way of maintaining a high degree of external validity while increasing the likelihood of detecting effects which might not be observed through the examination of group averages, as used in traditional designs. Their findings supported this contention.

At least three different types of goals have been identified in the literature (Hardy & Jones, 1994); outcome, performance, and process. Outcome goals focus on the outcomes of particular events and are usually based on social comparison processes (e.g., to win a competition). Performance goals also specify end products of performance, but success is viewed according to the attainment of absolute or self-referenced performance standards (e.g., making a gross score of 76 in a round of golf). Process goals specify behaviours in which the performer will engage during performance (e.g., ensuring the appropriate alignment prior to shot execution).

Goal-setting intervention studies have almost exclusively based their training programs on encouraging participants to set performance goals (e.g., Anderson et al., 1988; Burton, 1989; Swain & Jones, 1995; Weinberg et al., 1994). Miller and McAuley (1987), however, discussed the use of multiple goals (which included a process-based component) with their goal-setting group. The rationale for the use of performance goals is both clear and theoretically logical (see, for example, Burton, 1989; Hall & Byrne, 1988). According to Burton, performance goals are more controllable and flexible than outcome goals, and as such allow athletes of all abilities to raise or lower their subjective standards in order to keep them both challenging and realistic, thus ensuring high motivation, low anxiety, and consistent success. Further support for the superiority of performance goals over outcome goals has come from within the goal-orientations literature (e.g., Duda, 1992), and from work in applied sport psychology (e.g., Gould, 1993; Orlick, 1986). Indeed, Albinson and Bull (1988,

cited in Brawley, Carron, & Widmeyer, 1992) suggest that a "common error is the setting of 'a goal' which is an outcome of performance" (p. 13). However, following a review of the relationship between goal-setting and competitive anxiety, Beggs (1990) suggested that goal-setting is something of a "double-edged sword". Consequently, he surmised that even performance goals may elicit negative effects (similar to those normally associated with outcome goals), since they satisfy all of Locke and Latham's (1985) criteria for generating stress; they are important, require action, and may not always be achieved. Therefore, a further reason for the equivocal findings of previous studies may be that participants are being asked to set performance goals. Process-oriented goals may assist in providing a remedy for these shortcomings.

Process-oriented approach to goal-setting training

For highly complex tasks, long-term goal-setting training programs (for example, over the course of a season) may allow sufficient time for goals to stimulate the development of skill enhancement strategies which are needed to boost performance. However, it may be possible to reduce this time lag by breaking down relatively complex behaviours into discrete behaviours (processes) which combine to constitute the whole complex action. These processes provide the performer with a primary focus which, if adhered to, will increase the likelihood of successful execution of the target behaviour (Kingston & Hardy, 1994). Burton (1988) has further argued that strategies need to be defined and modified before goal-setting can have an effect on the performance of complex tasks. Process-oriented goals could logically form part of the strategy and technique development which leads to the eventual automation of performance (Hardy et al., 1996a). Preliminary research into the efficacy of process-oriented goals has indicated that they may reduce the performer's susceptibility to somatic anxiety and enhance performance in otherwise stressful competitive situations

(Kingston, Hardy & Markland, 1992). Process-oriented goals may therefore represent a more appropriate primary focus than traditional performance or outcome goals.

Although studies attesting to the effectiveness of process goals are rather thin on the ground, several researchers have at the very least implied that the task-focus of process based goals might facilitate concentration (Beggs, 1990; Boutcher, 1990; Hardy & Nelson,1988). Indeed, Hardy and Nelson stated that such goals may exert their influence upon performance through effective allocation of attentional resources. Furthermore, it could also be argued that process-oriented goals might enhance self-efficacy through increases in perceptions of control. As mentioned previously, Burton (1989) and Hall and Byrne (1988) have argued that performance goals enable performers to exert greater control over the performance outcome than normatively referenced outcome goals. Although correct, this does not mean that performance goals are entirely independent of external factors. For example, environmental conditions and the nature of opponents/playing partners can impact on the potential for goal achievement. Process-oriented goals enable the individual to exert almost total control since they are actually what the performer does in pursuit of the performance objectives. Therefore, process goals can be achieved more consistently, and consequently are likely to have a stronger and more reliable positive effect on self-efficacy.

Despite the relative lack of empirical studies attesting to the benefits of process goals, anecdotal support for the use of such goals has been widespread. In Orlick and Partington's (1988) study, performers reported using process goals to maintain their motivation for quality training. For example, a highly successful pistol shooter said:

> "I would write what I wanted to do and say to myself, 'What am I going to do this training session?' I wouldn't just get on the line and pump rounds down the range, but would actually go to the line with an intent, a goal, even if it was just to make sure

everything was smooth. When I go to the line, and set everything up, and take up the gun in my hand, I also mentally go through my shot plan checklist before I shoot. This strategy started out very mechanically with a physical list of words which I have on the shooting table, and which I read exactly. These words represented every single step involved in shooting a shot. Then I reduced these to key words so that I could go through the list faster. Finally I didn't need the list anymore. I would usually write one word to emphasise what I wanted, such as 'trigger' or 'smooth'. Then this shot-plan rehearsal became a mix of simple verbal reminders and images which I ran before each shot." (Orlick & Partington, 1988, pp. 111-112)

To summarise, it appears that studies which have sought to utilise goal-setting training programs to enhance performance and cognitions have not yet provided unequivocal support for their use. One of the principle reasons for this equivocation could be the situational relevance of the types of goals that participants have been asked to set. The current study, therefore, attempted to address this question by comparing a goal-setting training program based on the use of process-oriented goals with a traditional performance goal program and a no-training control condition. The goal-setting training continued across the course of a competitive season, and beyond, to the start of the next season. Program evaluation was based on the relative effects on skill level, in addition to the effects upon a number of psychological constructs identified as playing an important role in supporting skilled performance.

Following examination of relevant empirical studies and anecdotal reports, it was hypothesised that all dependent variables would be beneficially influenced by the use of goal-setting. Furthermore, golfers trained in the use of process goals would be: less susceptible to anxiety effects; have elevated self-efficacy/confidence; and have better concentration in comparison to those trained in the use of performance goals and the control group. In

congruence with cognitive evaluation (Deci & Ryan, 1985) and goal-setting theories (Locke, 1968; Locke & Latham, 1990), it was hypothesised that motivation would be enhanced through the use of goal-setting per se, irrespective of the primary focus (i.e. there would be no motivational differences between the two goal-setting conditions). Nevertheless, an interaction was anticipated due to control group differences.

Method

Participants

The participants were 37 male golfers from Ashbourne Golf Club, Derbyshire, UK. The participants represented a relatively wide range of standards (handicaps 0-28, M = 13.07, SD = 4.10) and ages (M=44.15 SD=10.87), with all participants regularly competing in club competitions. All participants volunteered for the study. Twenty eight of the participants agreed to take part in the intervention, and were allocated to one of the two goal-setting training groups (Group 1: handicap M = 12.89, SD = 5.39; and Group 2: handicap M = 11.78, SD = 3.55) using stratified random sampling. The stratification was achieved by ranking the participants in order of handicap and splitting them into pairs (i.e., Rank 1 with Rank 2, Rank 3 with Rank 4, etc.), with one from each pair being randomly allocated to each group. This produced two goal-setting training groups of 14 participants. The control group of 9 participants (handicap M = 15.36, SD = 7.40) chose to respond to questionnaires, yet did not want to commit themselves to the time requirement of the goal-setting training program. The control group were not given any details regarding the specific nature of the intervention.

Instrumentation

Performance (skill level). Skill level was determined by each subject's individual handicap (stroke allowance). Handicaps are adjusted following each competition round according to the guidelines of the Professional Golf Association. This allows an individual's

skill level to be determined throughout the course of the season, independent of performance adjusted for handicap (net scores), which of course (by its nature) confounds ability.

Competitive state anxiety inventory-2 (CSAI-2). Pre-competition levels of state anxiety and state self-confidence were measured using the CSAI-2 (Martens, Burton, Vealey, Bump & Smith, 1990). The CSAI-2 is a sport specific, self-report inventory which has been demonstrated to be a reliable and valid measure of cognitive and somatic anxiety, and self-confidence in competitive situations (see appendix 2). The scale comprises 27 items, with 9 items in each of the three sub-scales. Responses to each item are given on a Likert-type scale ranging from 1 (not at all) to 4 (very much so), with scores for each sub-scale ranging from 9 to 36.

Sports-related psychological skills questionnaire (SPSQ). Pre-intervention and post-intervention psychological skill levels were measured via Nelson and Hardy's (1990) SPSQ. The 6-point Likert type self-report questionnaire comprises 56 items in total, with 8 items in each of the seven psychological skills categories (see appendix 3). Response scores for each factor range from 8 to 48. The factors are labelled imagery skill, mental preparation, self-efficacy, cognitive anxiety control skills, concentration skills, relaxation skills, and motivation skills. Cronbach's alphas for the seven sub-scales all exceeded 0.78 (Nelson & Hardy, 1990). For the purpose of the present study the items representing imagery and relaxation skills were omitted because it was felt that no specific predictions could be made for differential effects on these factors from the two types of goal-setting training program. Rather, they were thought to be supporting skills which may be used in conjunction with goal-setting. Items relating to the mental preparation sub-scale were regarded as too generalised to differentiate between the two goal-setting conditions, and thus were also omitted. Therefore, the scales of interest were associated with: self-efficacy; cognitive anxiety

control; concentration; and motivation. While no group differences (between the goal-setting training groups) were hypothesised for the motivation sub-scale of the SPSQ, it was included to determine the presence of any motivational differences between the training and control conditions.

Manipulation checks. Manipulation checks were an integral part of each of the goal-setting training meetings. In addition to the verbal checks, which involved asking the participant about the specific goals that they were using or intended to use, each subject completed a goal-setting schedule which formed the basis for much of the discussions, especially during the individual meetings. The goal-setting schedule used in this study was essentially a table on which the participant could list long-term, short-term and intermediate goals, the methods/strategies to be used in pursuit of the goals, and to assess the progression towards those goals. Upon completion of the study all training participants were asked to respond to a social validation questionnaire created specifically for this study. This included two generalised questions with a 7-point Likert-type response scale asking: 1) "How did you feel about your participation in the study?", with responses ranging from -3 (disliked it) to +3 (enjoyed it) ; and 2) "Do you feel that this mental training has had an effect on your golf?", with responses ranging from -3 (impaired performance) to +3 (improved performance). Additionally, the social validation questionnaire provided the experimenter with information regarding the perceived effects of the training on different aspects of golf performance (see appendix 4).

Procedure

One week prior to the intervention all participants responded to the SPSQ. The following weekend they completed the CSAI-2 ten minutes prior to the commencement of a major competition round. Upon completion of the competition participants' exact handicaps

(stroke allowances) were collected once they had been adjusted with respect to competition scores. These data provided the baseline measures for the study. Although the participants were allocated to groups at this stage, they were not informed of any of the differences between the two training protocols.

The first training session for each group comprised a two-hour lecture/workshop, involving a general introduction to goal-setting and its everyday applications, as well as its use as a tool to develop golf performance. This session addressed the following issues: goals versus long term objectives (dream goals); concrete/specific goals; intentionality; goal achievement; goal commitment; breakdown of longer term goals and objectives; and the general benefits of goals (no distinction was made between goal types) as identified in the extant literature. The initial training session concluded with a brief discussion on the relationship between goal achievement and self-confidence.

The second part of the initial goal-setting training was administered at the same time the following week to both groups, again with the goal-setting training groups remaining separate. This second session involved a more detailed discussion of goal types (the focus of which was dependent on allocated group orientation), and the specific benefits of the allocated goals generally over normatively-referenced outcome goals. For example, the information imparted to the performance goal group focused primarily on the relative efficacy of self-referenced goals over the use of social comparison based goals. For the process based goal group, however, the emphasis was on the purported benefits of behavioural (and cognitive) based goals over which the performers exert complete control. This was in contrast to social comparison based goals, or performance goals which have the potential to become a source of stress when their achievement is put in doubt. In essence this training looked at the

logical progression of goal-setting based on the control which the individual can exert over the goals which are set.

The training continued with exercises to demonstrate the use of specific goals most relevant to that group's orientation, and how such goals might be used to enhance their approach and performance in golf. Concluding the workshop, participants were introduced to the concept of a goal-setting schedule so that they could break down their long-term objectives into 'manageable chunks' with long-term, intermediate, and short-term goals. They were asked to develop a schedule for their golf practice and competition performance to discuss at the next meeting. The total time for the workshop/discussion was approximately 90 minutes.

Approximately 2 weeks after the second training session, each of the participants (both goal-setting training groups) were seen individually on two occasions to discuss the goal schedules they had completed. Any difficulties or observations they had were discussed, and the benefits of the specific orientations were used as justification for perseverance with the use of the goals. These one-to-one sessions were reactionary in nature; that is, they were an opportunity for participants to discuss their specific feelings about the training and the schedules they had set. These sessions lasted about 15 minutes, and concluded with an invitation for each subject to go out and practice their goals (appropriate to training orientations), and to discuss them further should they experience any difficulties.

Upon completion of the initial goal-setting training (general, then group-specific on process or performance goals), and following approximately 3-months using the goals, the second set of data was collected using the same protocol as used for the first data collection. The data collected were skill level/performer's ability (as indicated by handicap), and CSAI-2 responses.

Following the initial intervention phase and the second stage of data collection, the next group meeting was arranged. This session took place in mid-September some 6 weeks prior to the end of the competitive golf season, and approximately 18 weeks following the completion of the first part of the goal-setting training. The 90-minute workshop was designed to give each subject an opportunity to air views on the goals that they had previously undertaken, in order to expose participants to potential modifications that they might make to their goals during the closed season. Additionally, both training groups were instructed in the use of pre-performance routines. For those in the process-oriented goal-setting training group, these routines were introduced as a natural progression of setting process-based goals. The performance-oriented group were given similar training, but the routines were identified as an adjunct to achieve their performance objectives, rather than an extension of the goal-setting process. In essence, for this study, the performance goal group was introduced to the concept of these routines for control purposes. It was viewed as an opportunity for participants to continue developing their goal-setting skills without compromising each individual's primary focus, and in fact it enabled the primary focus to be regularly and further reinforced. The sessions concluded with each subject verbalising their goals to other members of their training groups. A fourth meeting took place late in the competitive season, and followed a similar format to the previous session (i.e., a brief discussion of the goals that participants had set and their progression towards them, and if necessary how these goals might be modified for increased effect). This was followed by two further individual meetings each of approximately 15 minutes in duration, where the participants' specific schedules were again evaluated and refined where necessary, and specifically, where winter plans for practice could be discussed in terms of the ongoing goal-setting schedule.

The final subject meetings took place at the start of the following season. These were one-to-one sessions lasting approximately 30 minutes. They provided an opportunity for open discussion on the specific goals that had been set and the progression of the subject towards those goals. Where necessary, the instructor would recap on the potential benefits of the subject's goals, with continued reference to the type of goal which formed the primary focus for that subject's goal-setting training program.

The post-intervention data collection occurred approximately six weeks following the final meetings, and early in the next season, giving the participants sufficient time to practice and utilise their primary goals in more reasonable conditions. The CSAI-2 was administered prior to a major competition; handicaps were taken following the competition adjustment; and the SPSQ was administered in the week following the competition. Upon conclusion of the study, all training participants completed the specially designed social validation questionnaire (an outline of the timing and procedure for the goal-setting training and data collection can be seen in appendix 5).

Results

The primary purpose of this investigation was to determine the relative efficacy of process and performance goals over a voluntary control condition, in terms of affective, motivational, and other performance-related variables. Preliminary analyses involved a series of two-factor (group X test) analyses of variance, with repeated measures on the second factor. Analysis of variance (ANOVA) was employed to identify significant interactions (which were of primary interest) and main effects between the dependent and independent variables. Follow-up tests comprised Tukey's Honestly Significant Difference (HSD) tests, to indicate where the significant interactions and main effects had occurred. When both

significant interactions and main effects were found for a single dependent variable, follow-up tests on the main effects were disregarded on the basis that they were confounded by the significant interactions.

Given the nature of this investigation, it could be argued that analyses should involve the use of multivariate analysis of variance (MANOVA), as opposed to univariate ANOVAs. The use of MANOVA by inventory is reasonable given that it may be relevant to consider the linear combination of, for example, the anxiety sub-scales, since they all pertain to anxiety. However, the counter-argument is that, because the hypotheses stated are sub-scale specific, with a primary focus on patterns of effects for the different groups, univariate tests are more appropriate. Furthermore, as there were specific hypotheses about the patterns of effects to be obtained across the different dependent variables, the normal increase in Type 1 error associated with multiple univariate ANOVAs is no longer applicable (Stevens, 1986). As a consequence, no reduction in alpha levels was deemed necessary. The probability of committing a Type 1 error was therefore maintained at 5% for all statistical tests.

Skill level (as indicated by handicap)

ANOVA revealed a significant group by test interaction for skill (F (3.5,56) = 3.67, p <.05; using Huynh & Feldt's (1976) adjustment of the F ratio which corrected for a lack of sphericity in the data). Follow-up tests showed the process-oriented group improving significantly from test 1 to test 2 ($p < .01$), while the performance-oriented group did not improve from test 1 to test 2 ($p > 0.2$), but did improve significantly between test 1 and test 3 ($p < .05$). The control group showed no improvement across tests. It should be noted, however, that the presence of substantial group differences (in skill level) at test 1 renders training group and control condition comparisons problematic.

Table 1 Mean Ability Levels (as indicated by golf handicap)

	Test		
Training Group	1	2	3
Process	12.89 (5.39)	12.05 (5.07)	12.13 (4.97)
Performance	11.78 (3.55)	11.23 (3.73)	11.16 (3.77)
Control	15.36 (7.40)	15.46 (7.48)	15.67 (7.47)

N.B. The lower the handicap, the higher the ability level

Sub-scales of the CSAI-2

Although ANOVA failed to reveal significant group by test interactions for any of the CSAI-2 sub-scales, group main effects were found for cognitive anxiety (F (2,34) = 4.04, p < .05) and somatic anxiety (F (2,34) = 4.55, p < .05). Follow-up tests showed that both training groups experienced lower cognitive anxiety than the control group (see Table 2). No group main effects were found for the self-confidence sub-scale. However, a significant test main effect was identified for self-confidence (F (2,68) = 9.49, p < .01). Follow-up tests indicated an increase in state self-confidence from test 1 to test 3. No test main effects were found for the cognitive or somatic anxiety sub-scales.

Table 2 Means and Standard Deviations for the Sub-scales of the CSAI-2 (Martens et al., 1990)

	Cognitive Anxiety			Somatic Anxiety			Self-confidence		
Goal-setting	Test			Test			Test		
Training Group	1	2	3	1	2	3	1	2	3
Process	18.64	16.00	17.07	14.00	11.71	11.71	21.57	25.86	28.43
	(3.63)	(3.88)	(5.95)	(3.57)	(2.49)	(3.20)	(4.57)	(5.86)	(5.03)
Performance	16.21	16.29	15.71	13.50	13.14	13.36	22.78	24.00	25.57
	(4.79)	(4.53)	(5.20)	(3.74)	(3.98)	(4.38)	(4.58)	(4.21)	(5.81)
Control	19.56	21.33	20.11	16.78	16.22	15.11	21.33	23.89	23.56
	(4.07)	(3.04)	(5.44)	(3.93)	(4.76)	(4.17)	(4.15)	(4.91)	(3.13)

Sub-scales of the SPSQ

Significant group by test interactions were identified for self-efficacy ($F(2,34) = 3.39$, $p < .05$); cognitive anxiety control ($F(2,34) = 6.47$, $p < .01$); and concentration ($F(2,34 = 3.81$, $p < .05$). Follow up tests indicated that the process-oriented group experienced significant improvements following the goal-setting training, while neither the performance goal training group nor the control group showed such positive effects (see Table 3). In addition to the significant interaction, a group main effect was also identified for the concentration sub-scale of the SPSQ ($F(2,34) = 3.37$, $p < .05$). However, as discussed previously, this was not followed up due to the confounding influence of the significant interaction. No significant main effects or interactions were found for the motivation sub-scale (ANOVA on interaction, $F(2,34) = 0.89$, $p = .42$).

Table 3 Means and Standard Deviations - SPSQ (Nelson & Hardy, 1990)

	Self Efficacy		Cognitive Anxiety Control		Concentration	
Goal-setting	Test		Test		Test	
Training Group	1	3	1	3	1	3
Process	29.93 (4.65)	34.14 (5.00)	27.43 (7.53)	32.86 (8.45)	26.71 (6.16)	32.29 (7.81)
Performance	33.07 (3.13)	32.07 (3.91)	31.29 (6.04)	32.14 (6.48)	29.79 (6.32)	30.79 (6.25)
Control	29.89 (6.70)	30.56 (4.59)	28.89 (8.28)	25.44 (5.22)	25.56 (4.10)	23.89 (4.11)

Manipulation Checks and the Social Validation Questionnaire

The verbal manipulation checks and ongoing examination of the goal-setting schedules clearly indicated adherence to the goal-setting training programs and to the particular goal types assigned to each training group. Individual t-tests were carried out to compare the training group responses to the two generalised questions (see procedure).

Control participants were not required to complete these checks as they were not involved in any training. Interestingly, while there were no significant differences between the training groups in terms of the question relating to their feelings regarding the study, there was a difference ($t(13) = 2.46$, $p < .05$) in response to the question regarding the perceived effect of the training upon participation in golf. Examination of the means indicated that the process-oriented group ($M = 1.29$, $SD = 0.61$) perceived their goal-setting training to have had a more beneficial effect on performance than the performance-oriented group ($M = 0.79$, $SD = 0.58$).

Discussion

While the beneficial effects of goals are becoming more widely recognised by practising sport psychology consultants, the evaluation of goal-setting interventions and training programs in sport settings has been problematic. The current investigation sought to examine the relative efficacy of two different goal-setting training interventions upon performance, and a number of psychological processes thought to support performance in a complex task. Results from the study present

quite a strong argument for the utilisation of goal-setting as a valuable psychological intervention strategy, and also generally support the hypotheses attesting to the comparative efficacy of process-oriented goal-setting relative to the more traditionally used performance goals. Specifically, the results yielded statistically significant interactions for skill level, which indicated that the process goal group improved from test 1 to test 2, while the group trained in the use of performance-oriented goals did not improve until test 3. Furthermore, significant group by test interactions for self efficacy, cognitive anxiety control, and concentration also indicated that, relative to the group utilising performance-oriented goals, the process-oriented goal-setting training group demonstrated significant improvements in skills thought to support effective performance. It should be noted, however, that the potential for placebo/expectancy effects cannot be ignored, and therefore a degree of caution should be exercised when interpreting these results.

Of most salience to performers and practitioners are the improvements in skill level (through the recognised measure of golf handicap), indicating that self-referent goal-setting per se has beneficial effects on performance. Furthermore, as well as process-oriented goals leading to more immediate improvements in performance, the results for the supporting psychological skills suggest that training athletes to set goals which have strategy development as a primary focus, may serve as a mechanism for improved performance. Burton (1988) has argued that, for complex tasks, strategies may need to be defined and acquired for goal-setting to have an effect. Clearly, however, process-oriented goals are often, by their very nature the strategy for reducing the complexity of a given task, and hence may have double the value. It should be noted that there is no reason why the effects of process goals on

performance should be solely mediated by anxiety changes. Process goals per se clearly contain information that might enhance attentional focus independently of whether or not participants are consciously aware of it (cf. Hardy & Nelson, 1988).

With regard to the sub-scales of the CSAI-2 and the SPSQ, the results again warrant some discussion. In addition to the increased levels of control that performers exert over process-oriented goals, the elevated self-efficacy for golfers in the process-oriented training group may also represent an increased understanding of how to attain their goals. The significant interactions identified for concentration and cognitive anxiety control (as measured using the SPSQ) might indicate that the use of form and technique as goals require participants to allocate substantial attentional resources to that objective. This may result in a consequent reduction in attentional resources available for otherwise superfluous information, especially in competitive situations (cf. Nelson & Hardy, 1988). This argument, however, does not necessarily contradict the contentions of Masters (1992), who suggests that for well learned skills focusing on specific components may lead to a breakdown in automaticity and subsequent decrements in performance. Developing, refining, and practising process-oriented goals of a more holistic nature may well encourage both chunking and automaticity (Hardy, Mullen & Jones 1996b; Kingston & Hardy, 1994).

A further point with regard to the motivation sub-scale of the SPSQ is noteworthy. Investigators have frequently suggested that goals exert their influence primarily through motivational channels (e.g., Locke et al., 1981). However, the existence of neither significant main effects nor interactions for the motivation sub-scale appears to indicate that, in this instance, this may not be the case. Under evaluative conditions (which are equally likely to exist for the control group as for

the two training groups), most participants are highly motivated to demonstrate high levels of ability. This seems likely to negate most of the motivational benefits of employing goal-setting techniques in 'real life' sports settings. Indeed, had motivational differences existed between the control subjects and the goal-setting training subjects this would most likely have elicited a motivational sub-scale main effect. It may be the case that goals exert a positive effect in sport settings only to the extent that they exert an influence on other psychological or behavioural parameters; for example, the effects of process-oriented goals on concentration, self-efficacy, and cognitive anxiety control. In Orlick and Partington's (1988) study, highly successful performers appeared to use process-oriented goals to maintain their motivation for 'quality' training. This suggests that the perceived purpose of the goals used may have an important role in determining their effectiveness, and further indicates that the traditional quantitative view of motivation may be highly restrictive (Hardy et al., 1996a).

In addition to reporting statistically significant findings and identifying a process goal orientation as the most appropriate primary focus for competition, the current study also warrants discussion in terms of the wider implications of the design and conclusions. While there are undoubtedly control problems with field studies of this nature, they have extremely high external validity. Swain and Jones (1995) have recently suggested that high ecological validity is an important tenet of effective studies in the area of goal-setting. The present study also starts to meet the identified need for studies: to be conducted over the course of a playing season (Weinberg, 1992; Weinberg et al., 1994); to contain an adequate manipulation check; to assess individual sports; and to actively compare two separate elements of what

may essentially represent facets of a more general intervention package (Greenspan & Feltz, 1989).

A potential problem with the present design relates to the use of a non-traditional control group. Herein lies a common problem: psychological interventions of this nature suffer because control participants who choose not to take part in interventions may act as confounds due to their lack of "normality" on certain psychological variables. Conversely, however, had we chosen to allocate participants to a control condition, the members of the non-treatment control group might have reasonably tried to glean information with regard to the intervention from other participants. This information could then have been utilised to spontaneously set goals, and thereby reduce the effectiveness of the control condition. Moreover, allocating participants to a non-treatment control condition may have serious implications in terms of motivation. As previously discussed, the control group in this study showed no motivational differences to either of the treatment conditions. Although control group differences may not have been the primary interest of this study (we were more interested in the differences between the training groups), they do warrant attention. The differences that can exist often provide researchers with important information about the nature and type of individuals who choose not to participate fully in studies of this nature. Of course, published studies of this type rarely include information about non-volunteers/participants (not surprisingly), or even about those participants who fall into the "experimental mortality" category. One of the questions that we as sport psychology researchers should be committed to attempt to answer is: What are the factors that lead individuals to avoid involvement?

The spontaneous setting of goals by participants within the control group was not a concern of this study (goal-setting training participants were not assigned goals); rather, we were interested in whether participants could be trained to set goals in a manner and of a type more beneficial to performance.

While the results of this study provide some support the use of process-oriented goals, it could be argued that we can perform most effectively by using multiple goal-setting styles (cf. Hardy et al., 1996a; Kingston & Hardy, 1995). Kingston and Hardy (1994) have highlighted how golfers may use different types of goals within the framework of preparation and execution of skills. For example, a golfer might set an outcome goal of winning a tournament in order to motivate himself or herself to go out and practice. He or she might set a series of performance goals to increase the salience of practice. Finally, he or she might use process-oriented goals to aid concentration and the allocation of attentional resources during both practice and competition. What is important is the degree to which we prioritise the goals within different situational contexts (Kingston & Hardy, 1994). In short, outcome or performance goals might be very important to get one to the practice ground, but process goals might be much more important to ensure that one uses the time spent at the practice ground to best effect.

Anecdotal reports from elite performers (Orlick & Partington, 1988), and preliminary research (with non-elite players) from the present study indicate that process goals appear to have an important function. Nevertheless, process goals present something of a paradox in relation to the conscious processing hypothesis which has been formulated by Baumeister (1984), Masters (1992), and others. According to this hypothesis, consciously focusing on process goals should lead to a

reduction in automaticity, relapse to conscious control, and disruption to performance because of the explicit nature of such goals (Hardy et al., 1996b). Alternatively, however, one might reasonably argue that elite performers use such goals as 'holistic' conceptual cues for the to-be-performed behaviour; for example 'smooth' or 'tempo'. Such holistic goals may encourage chunking and automaticity, thereby allowing the appropriate sub-actions to be generated implicitly. For less able performers, however, process goals may enhance skill levels by focusing attention on key parts of performance; for example, to execute a forward-press prior to putting. A more holistic conceptual representation of the skill might prove meaningless to a less skilled individual who is still consciously controlling much of the skill. However, empirical evidence that addresses these conjectures is not yet available.

In conclusion, the author contends that it is the responsibility of sport psychologists, coaches and other practitioners to ensure that all the different goal-setting styles remain salient to the performer, and that performers do not become so preoccupied with certain types of goals that they are prevented from focusing on those things that they need to do in order to realise their objectives.

Chapter 4

Case Study: Pre-Performance Routine Training In Golf

Abstract

There has been general, if not unequivocal support for the use of pre-performance routines with golfers (see Cohn, 1990). It has further been suggested that such routines should avoid an explicit focus on the specific components (processes) within the routine as these provide a possible anchor for conscious processing when under stress (Hardy, Mullen & Jones, 1996b; Kingston & Hardy, 1997). The purpose of this study was to examine the impact of a pre-performance routine training programme that involved the use of holistic process oriented goals (these may reduce the potential for conscious processing). A case-study approach was taken to address this issue. The subject was a 32 year-old professional golfer who embarked on a 25-week training programme to develop and refine his current pre-shot behaviours. A multiple-baseline type data analysis assessed the effects of the routine training on four aspects of the clients golf game (putting, chip-shots, approach play, and drives). Specifically, the dependent measures were the stability of the routines (time to complete), and a subjective performance rating for each stroke.

One-way repeated measures ANOVAs indicated that the routine training had a positive effect on the stability of the pre-performance routines for putting, chip-shots and approach play ($p<.05$), however, only chip-shot performance increased ($p<.05$). These results suggest that, while pre-performance routine training using holistic process goals may have some benefits, future studies should emphasise the

possible time-lag between adoption and positive performance effects, and the associated motivational implications.

Introduction

The ability to implement cognitive behavioural strategies to regulate psychological and physiological states is viewed as an important determinant of effective performance (Gould, Weinberg & Jackson, (1980); Shelton & Mahoney, 1978; c.f. Gould, Ecklund & Jackson, 1992). Mahoney and Avener (1977) identified that the ability to self-regulate in a highly competitive environment was a distinguishing factor between those gymnasts that made the United States Olympic team and those who did not. According to Boutcher (1990), this skill is especially important for those involved in self-paced, closed skills. In such cases, there are relatively few perceptual and decision making demands (Hardy, Jones & Gould, 1996a), and thus, the non-reactionary nature of the sports task provides extensive opportunities for athletes to focus on both internal (thoughts and feelings) and external (environmental) distractions.

Mace (1990), in his review of cognitive behavioural interventions suggested that such techniques appear to have great potential in the context of sport, particularly with regard to stress management. Certainly over the last 20-years a plethora of empirical studies have shown this to be the case (see, Cohn, 1990 for a brief review). Under the general heading of cognitive-behavioural techniques, there are numerous specific strategies that have facilitated the execution of motor skills across a variety of sports. These strategies included, attentional focus, self-talk, relaxation, imagery and preparatory arousal. In supporting the notion that cognitive

behavioural techniques may be effective in reducing anxiety in competitive performance, Murphy and Woolfolk (1987) added that this did not automatically result in improved performance.

One cognitive-behavioural strategy commonly used with sports performers involves the utilisation of pre-performance routines. These routines typically comprise of a combination of cognitive and behavioural strategies the purpose of which is to prepare the athlete optimally for skill execution, normally within self-paced sports. They are in essence a collection of well-learned process goals linked together to form a coherent flowing routine (Hardy et al., 1996a; Kingston & Hardy, 1994; 1997). Process goals specify behaviours in which the performer will engage during task execution (Kingston & Hardy, 1997). One of the earliest studies into the effects of pre-performance routines on performance defined the routine as "a set pattern of cue thoughts, actions and images consistently carried out before performance of the skill" (Crews & Boutcher, 1986, p. 291). The exact nature of the routines will be highly individualised and, according to Cohn (1990), when determining the specific content a number of factors need to be considered; the nature of the required task, the skill level of the person, and performer's individual differences.

Boutcher and Rotella (1987), proposed a psychological skills enhancement program for closed-skill performance, and within this program they cited an observational analysis of the pre-shot behaviours of professional golfers carried out by Crews and Boutcher (1986). According to these researchers, a typical pre-performance routine of professional golfers comprises the following:

1. Setting (establishing optimal arousal level);

2. Imagery (visualising the flight and/or the outcome of the shot);

3. Kinaesthetic coupling (visualising and feeling the upcoming shot);

4. Set-up (the address position);

5. Waggle (small movements of the club);

6. Swing thought (e.g., think 'tempo' or 'rhythm').

For any performer, the individual components (or processes) which comprise the routine would have to be mastered before being 'chunked' together to form a coherent and holistic pattern of cognitive and behavioural strategies. For example, an athlete would need to effectively implement relaxation or activation strategies in order to achieve an optimal level of arousal. The challenge for the athlete is to find the most efficient 'cocktail' of strategies which can be integrated into a coherent, repeatable routine prior to each specific type of shot (Boutcher, 1990). Studies into the efficacy of pre-performance routines in sport have principally focused on their application to closed-skill sports, for example golf (Beauchamp, Halliwell, Fournier & Koestner, 1996; Boutcher & Crews, 1987; Crews & Boutcher, 1986), basketball free-throws (Lobmeyer & Wasserman, 1986; Wrisberg & Anshell, 1989) and tennis serves (Moore & Lloyd, 1986, c.f. Cohn, 1990). While pre-performance routines are highly applicable to sports with an emphasis on closed skills, there is no reason why such routinised behaviours could not be effectively applied within open-skilled sports (i.e. those where the performer must respond to a the changing environment). For example, to refocus attention or to recover after a mistake (Hardy et al.,1996a).

A number of theories have been forwarded to explain the positive effects of pre-performance routines. At a basic level it is argued that routines facilitate

performance by directing attention towards task relevant cues, and by eliciting appropriate levels of arousal (Boutcher, 1990). More specifically, in a detailed review Cohn (1990) suggested four basic theoretical standpoints which may support the use of routines in sport. Firstly, and according to Cohn the most important theory underlying the use of pre-performance routines is Schema Theory (Schmidt, 1975). Within Schmidt's model, each motor movement is stored in memory in the form of a generalised motor program that may be retrieved, refined and executed. The purpose of the pre-performance routine would be to assist the athlete in selecting a motor program from similar stored responses and to define the specific movement parameters to match the requirements of the task. The second theoretical perspective to consider relates to the concept of stages of motor learning (Fitts & Posner, 1967). One part of this theory refers to advanced performers executing tasks automatically. In this state, tasks are performed smoothly and efficiently with minimal cognitive processing. Thus, attention is freed to become involved in other strategy related aspects of the game, while the primary task execution remains automatic (Schmidt, 1988). Thirdly, the set hypothesis (Nacson & Schmidt, 1971, c.f. Cohn, 1990) suggests that optimal performance requires modifications in the internal state or set of the athlete for the specific demands of the task. The purpose of the pre-performance routine is to enable the performer to return to the appropriate internal set that matches the task requirements, and thus facilitates performance of the skill. Finally, it is widely accepted that practising a skill mentally facilitates transfer to the actual skill (Mahoney & Avener, 1977). According to Schmidt (1988), a diluted form of the actual motor program is run off when practising mentally to the extent that muscular contractions associated with the movement are not visible. In effect the

routine serves to prime the neural pathways, and further reinforce the blueprint of the appropriate movement.

The precise mechanisms by which pre-performance routines exert their influence appear to be rather contentious, however, all explanations seem to involve establishing an appropriate, task specific activation state. According to Boutcher & Zissner (1990) achieving the desired state may be enhanced by using routines (c.f. Hardy et al.,1996a).

As mentioned previously, research has generally supported the use of pre-performance routines particularly within closed-skill sports. Crews and Boutcher (Crews & Boutcher, 1986; 1987; Boutcher & Crews, 1987) in particular appear to have pioneered research into the application of pre-performance routines in golf. They confirmed (through observation of LPGA professionals) the existence of well-defined consistent routines for both putts and full-swings (Crews & Boutcher, 1987). Subsequently, they provided reasonable evidence that the routines might have potentially positive effects for certain athletes. Crews and Boutcher (1986) found that golf performance for male beginners significantly improved following routine training, and Boutcher and Crews (1987) found that for both male and female (collegiate golfers) training in the use of pre-shot routines for putting increased the length and consistency (time) of their pre-shot routine. They noted however that only the female group increased their performance. More recent studies (Cohn, Rotella & Lloyd, 1990; Beauchamp et al., 1996) have further supported the use of pre-performance routines in golf, although, it is interesting to note that neither study reported any immediate improvements in performance. Nevertheless, researchers in this area have pointed out a number of positive effects on specific aspects of

performance that might provide an indirect channel through which positive performance effects could be accrued. These include: adherence to the routine; perception of beneficial effects (Cohn et al., 1990); increased attention to the task (Boutcher & Crews, 1987; Cohn et al., 1990); lower arousal levels (Boutcher & Crews, 1987); increased intrinsic motivation; and less negative introjection (Beauchamp et al., 1996). It is also worth noting that Murphy and Woolfolk's (1987) study which examined the effect of a cognitive behavioural intervention (involving imagery and self-talk) on golf-putting performance also elicited reductions in competitive anxiety, but no improved performance. Interestingly, Beauchamp et al., (1996) suggested that there may be a significant time-lag between adoption of a particular routine, and its capacity to effect performance improvements.

It is apparent that there is general (if not entirely unequivocal) support for the use of pre-performance routines in golf. Previous studies have highlighted a number of issues that require consideration when examining the effects of pre-shot behaviours in golf. The most obvious for applied sport psychology is the potential for realising performance improvements. Although there is consistent support for routine training increasing the consistency of pre-performance behaviours (Beauchamp et al., 1996; Boutcher & Crews, 1987; Cohn et al., 1990), there is not always an immediate translation to performance improvements. While a variety of individual difference factors may have an impact on the effectiveness of different types of mental training, perhaps the most salient factor that distinguishes between subjects used in the studies discussed to date is the skill level of the participants. Indeed, Crews and Boutcher (1986) indicated that their positive performance effects could be attributed to the skill level differences between their comparison groups (i.e. a certain level of skill may be

required before pre-performance routines positively effect performance). Furthermore, in a review of the pre-performance routine literature, Crews (1990) concluded that pre-shot routines facilitate consistency, but possibly improve performance only in those players who are beyond the beginning level of skill development (cf. Crews 1994). Therefore, one potential reason for the equivocal nature of the research into pre-performance routines to date might be that they were not sufficiently tailored to the skill levels of the performers.

Perhaps the most compelling evidence for the benefit of pre-performance routines with elite performers comes from Orlick and Partington's (1988) qualitative study which found the use of pre-performance routines to be a distinguishing characteristic of successful Olympians. Hardy et al., (1996a), summed all this up when they suggested that, "pre-performance routines are used by elite performers and do seem to help them to achieve high levels of performance" (p.130). The positive effects of consistent pre-performance routines with elite golfers have also been well documented (Crews & Boutcher 1986). Singer (1988), suggested that, "a great golfer must be able to go 'trance-like' to ready, focus attention, and execute automatically like a machine." . The key may be that in order for the athlete to perform optimally, he/she needs to achieve a degree of automaticity, where the skill is performed smoothly with little cognitive effort and a high degree of consistency. Pre-performance routines may provide a vehicle through which to elicit automatic functioning. The importance of this automatic functioning for expert golf performance has been demonstrated elsewhere (see Cohn, 1991).

If we accept that consistent, well-learned routines tailored to the specific demands of the client and his/her sport have a positive effect upon performance (e.g.

Crews & Boutcher, 1987), then it follows that a precursor to these positive effects is the establishment and stabilising of the routine. One of the characteristics of automatic functioning is a high degree of stability in the timing of the execution of similar tasks. A high degree of consistency in the timing of the pre-performance routine implies that the performer is carrying out similar cognitive and behavioural strategies (a necessary prerequisite for automatising routines). There is some evidence to suggest that one of the initial consequences of pre-performance routine training is a reduction in the variability of the time taken to complete the routine (e.g. Beauchamp et al. 1996; Boutcher & Crews 1987; Moore, 1986, cf. Cohn et al., 1990). Cohn et al. (1990), however, failed to substantiate these findings. They attributed this lack of increased consistency to the subjects being in the early stages of new routine development. In a comparison of routines for elite and beginning golfers, Boutcher and Zissner (1990) noted that elite golfers possessed significantly less variable pre-shot routines. It is logical to argue that, In the absence of major external distracters, a lack of stability (time) in a pre-performance routine may be caused by either an explicit focus (on task components normally performed automatically), or excessive internalising (e.g. worries/concerns about effectively executing the skill).

According to the Conscious Processing Hypothesis (Baumeister, 1984; Masters, 1992; Hardy et al. 1996b) anxiety can cause a relapse towards a focus on explicit rules associated with the task. When skills are normally performed automatically, the consequence of this explicit focus may be a reduction in automaticity and associated decrements in performance. For example, in golf, this might take the form of trying to steer the ball towards the intended target (i.e.

focusing on the direction of the stroke) rather than trusting the swing and focusing on a smooth 'tempo'. The Conscious Processing Hypothesis provides something of a paradox regarding the use of process oriented goals. Kingston & Hardy (1997) have provided evidence that using single process goals can be an effective strategy to achieve performance and cognitive benefits in competitions. Hardy, et al. (1996b) however, contend that such goals may elicit conscious processing and so cause disruptions in automaticity and associated decrements in performance. To address this paradox, consideration must be given to the issue of automaticity. As the performer develops their skills, the movement sequences become more refined until, at the advanced stage they are performed with efficient automaticity (Fitts & Posner, 1967; Reber, 1993). The participants in Kingston and Hardy's study were club golfers who, it could be argued were focusing on processes (strategies) which were not previously executed automatically. Therefore, they may have benefited from the explicit focus on the process because it was an aspect of technique they were trying to master. The process goals may also have reduced the potential to focus on other, perhaps distracting information. It is logical (according to Conscious Processing Hypothesis) to suppose that, had the skills previously been performed automatically, the use of single process goals might have had a disruptive effect on performance.

The goal of a pre-performance routine training program with a skilled athlete should be, therefore, to minimise the potential for performers to 'regress' to a more explicit focus when placed under more stressful conditions. Consequently, although the routine may comprise a series of individual process goals, the key is to ensure that these are chunked effectively (and automatised) in order to initiate a more holistic representation of the to-be-performed action. Initiating the general

representation using a cue word (or holistic process goal) which avoids a more explicit focus should reduce the potential for regression to more crude control strategies (Kingston & Hardy, 1994; 1997).

The primary purpose of this study was to examine the effects of a 'more' formalised pre-performance routine training programme using holistic process goals as cues. The first hypothesis associated with the intervention was that the stability (time) of the client's routine would be improved. This increased stability will be indicated by a reduction in the variability of the timing of the pre-performance routine. It was hoped that achieving a high degree of consistency (and then automaticity) within the routines would increase the likelihood of eliciting positive performance effects. Therefore, the second hypothesis was that, once the routines have become stabilised (and perhaps approach automatisation), the client would experience increases in (perceived) performance.

Method

Participant

The current intervention involved the provision of psychological support to a Professional golfer who had established himself as a teaching professional while running a successful 'golf' business. He was 32 years old, and was working towards playing on the professional golf 'tour'. The client had sought the advice of a sport psychologist. His purpose in seeking the help of a sport psychology consultant was to improve his performance particularly during high level competition. He described himself as typically under-performing (relative to his skill level) at such competitions.

The Assessment Phase A consultancy approach to providing psychological support was adopted (Hardy & Parfitt, 1994). Within this approach, both the client and the consultant are viewed as bringing expert knowledge to the situation. The early meetings with the client involved observation at practice and in competitions and talking with him about his game, his goals and his motivation for those goals. Observation of his training behaviour and a discussion of his goals indicated that he was highly motivated to reduce his perceived weaknesses.

After a rapport was established he described his performances in recent major competitions in some detail. According to the client he would enter a competition feeling confident, invariably start reasonably well in terms of his score, and would then have a few bad holes in succession. Following a number of poor holes, he would normally regain his game and finish strongly (although he would be too far adrift to make any impact on the leaders). This was a typical pattern for the major events he entered.

Observations suggested that one of the principle reasons for dropping shots was the failure to recover from situations where recovery was possible (While this was initially a subjective assessment, it was confirmed by other 'experts' who had observed the client). For example, a typical scenario would be that the client would miss a green with an approach shot, and rather than chipping and putting to make a par or at worst a bogey, he would confound the problem by hitting a relatively poor chip, and then take two or even three putts. The client perceived the problem to be an issue of putting rather than chipping, and on questioning about the hole after the round would typically say 'oh yes I missed that putt' when the root of the problem appeared to lie elsewhere. It was found that when the client did hit bad shots, he

seemed to become agitated, rushed, or even at times took noticeably longer to play his shots. This was confirmed by unobtrusively timing the preshot intervals for each particular type of shot throughout a number of practice and competition rounds. It was also noted that when he performed well, his routines were highly systematic and consistent.

The Intervention As discussed previously, one way to overcome the variability in the timing of the preparation for strokes would be to establish highly consistent pre-performance routines cued using holistic process goals. The efficacy of such routines is well documented (see Crews & Boutcher 1987, Boutcher & Crews 1987, Boutcher & Rotella 1987, Boutcher 1990), their purpose being to elicit a state of automatic functioning when executing each shot. The development and refinement of these routines may have a 'double-hit' effect by influencing performance through other channels. For example, achieving goals has implications for gaining the self-confidence to trust the automatic processes (Bandura, 1977; 1986). Furthermore, pre-performance routines should also reduce the likelihood of a tendency to revert to conscious control, since learning the action in a holistic manner should prevent the golfer from focusing on specific aspects of the skill, which may prevent smooth co-ordinated movement (Boutcher & Crews, 1987).

After detailed discussion between the client and the consultant, the initial goal agreed was to develop a more systematic, and consistent pre-performance routine prior to putting and chipping. Furthermore, it was also agreed that the longer-term objective would be to develop and refine the routines used in other aspects of his game (e.g. fairway irons and drives).

Data Collection and Treatment Phases

Baseline In order to determine the effectiveness of the routines from a quantifiable perspective, baseline data was collected on the client's current pre-performance behaviours. On two occasions prior to the intervention (with a one-week gap in between), the consultant and an experienced colleague independently collected timing data for the pre-performance behaviours of the client during complete rounds of golf. The protocol for collecting the routine time followed that of Cohn et al., (1990), where, "the completion time for putting and chipping was measured from when the subject reached the furthest point behind the ball (to look at the line of the putt or chip) to the point when he made contact with the ball" (p.38). This protocol was subsequently utilised for all aspects of the game.

Treatment - Phase One The specific refinement of the routine relied heavily on the ability of the client to independently determine the key aspects of preparation for the up-coming shot. To assist the client, his pre-shot behaviours were recorded across a variety of situations, and he was provided with a model routine used by other professional golfers (Boutcher & Rotella, 1987; Boutcher, 1990). In addition to the behavioural aspects of the routine, the importance of the mental aspects of the routine were impressed on the client. After talking through the recorded routines, it was established that in normal situations he incorporated relaxation strategies and imagery into his behavioural routine (for example, he described looking from the ball to the target and visualising the intended flight of the ball). Once a consistent routine was established, the client was encouraged to use the routine during every aspect of his golf practice (i.e. on the range, playing practice rounds, social games).

The client practiced or played on most days during the intervention period. While there was little control over the amount of actual practice the client engaged

in, weekly telephone calls were made to reinforce the importance and value of high quality practice. Furthermore, on six occasions over the course of two-months, the consultant observed the client practising in order to reinforce the use of the routines for chipping and putting.

Data Collection One The initial phase of the intervention lasted approximately ten-weeks. Two-weeks after this period had elapsed, the client was videotaped playing two complete rounds of golf on his local course (a week elapsed between the recorded observations). Prior to the rounds he was asked to try and treat the games like important competitions. The routines for all aspects of his game (except bunker shots) were timed according to the protocol used previously. The routine timing of bunker shots was not recorded as it was felt that they could not be readily classified into any of the categories of shot used. Following the round, the client was asked to talk in detail about his round, and provide a subjective assessment of the quality of each timed stroke (i.e. a mark out of 10).

Treatment - Phase Two Approximately one-week following the videotaping of the clients rounds, and with his agreement, the primary focus of the routine training was changed to emphasise the use of pre-performance routines for approach shots and drives. Similar to the refinement of the routines for chipping and putting, the approach shots and driving routines were recorded and these were used as a starting point for the pre-performance routine refinement. Once again, Boutcher's (1990) routine of professional golfers was used to guide the client in developing a more consistent routine and, in congruence with Phase One of the routine training, the client was observed in practise, and when appropriate the importance of maintaining a systematic, repetitive routine was reinforced.

Data Collection Two The second phase of the intervention also lasted approximately 10-weeks, and during this time the client was again videotaped playing two complete rounds of golf at his local course (with a week elapsing between the observations), and asked to give a subjective assessment of his performance on each timed stroke (see appendix 6 for a summary of the intervention).

Results

To analyse the data, four separate one-way ANOVA's were carried out on each aspect of the game (putting, chipping, approach play and drives). A multiple-baseline approach was used, because the intervention for the putting and chipping was implemented approximately 13-weeks prior to that of the other shot types. While single-subject designs and case-studies of this nature can be criticised from a methodological standpoint, such designs can provide a sound framework on which to assess sport psychology interventions (Shambrook & Bull, 1996). Although there are a number of possible variations of such designs, according to Kazdin (1982), the absence of serial dependency (indicated by the lack of a significant correlation between adjacent data points within each phase of the intervention) permitted analysis using F-tests (analysis of variance) to determine changes over time. Moreover, since analysis of variance is robust to departures from normality (Vincent, 1995), its use is further justified.

In order to reduce the time delay in introducing the routine training to all aspects of the game, and to attempt to minimise the possible interdependence between the baselines (Kazdin, 1982), it was felt that administering the programme to two aspects of the game at a time would be useful. Therefore, baseline measures

for putting and chipping were gathered on two occasions and on four occasions for approach-shots and drives. Conversely, post-intervention measures were collected on four occasions for putting and chipping components of the game, and on two occasions for approach-shots and drives. The two dependent variables considered were performance (a subjective rating of each shot from 0-10), and stability (indicated by the average error from the mean of pre-performance routine times for each shot type at each session). The independent variable was time (six sessions).

Performance

Table 4 outlines the data for subjective performance. Analysis of the data indicated a significant difference in chip-shot performance $F(5,46) = 3.62$, $p<.01$. Tukey's post-hoc tests indicated an improvement in chip-shot performance from Session 1 to Sessions 4 and 5 (see Figure 1). There were no significant changes in performance for each of the other shot types.

Table 4 Means and Standard Deviations for Performance

	Session					
	1	2	3	4	5	6
Drives	8.40 (1.59)	6.86 (1.88)	8.14 (1.56)	6.79 (1.58)	7.79 (1.76)	7.36 (1.74)
Approach-play	5.88 (1.89)	6.78 (1.99)	6.25 (1.84)	6.83 (2.04)	6.94 (1.92)	7.11 (1.74)
Chips	5.14 (2.54)	6.38 (1.41)	6.22 (1.86)	7.78[1] (.83)	8.29[1] (1.11)	6.86 (1.57)
Putts	7.28 (1.49)	7.94 (1.26)	6.78 (1.90)	7.78 (1.99)	6.83 (2.07)	7.67 (1.65)

[1] significantly > Session 1

Figure 1 Performance scores for chips and putts

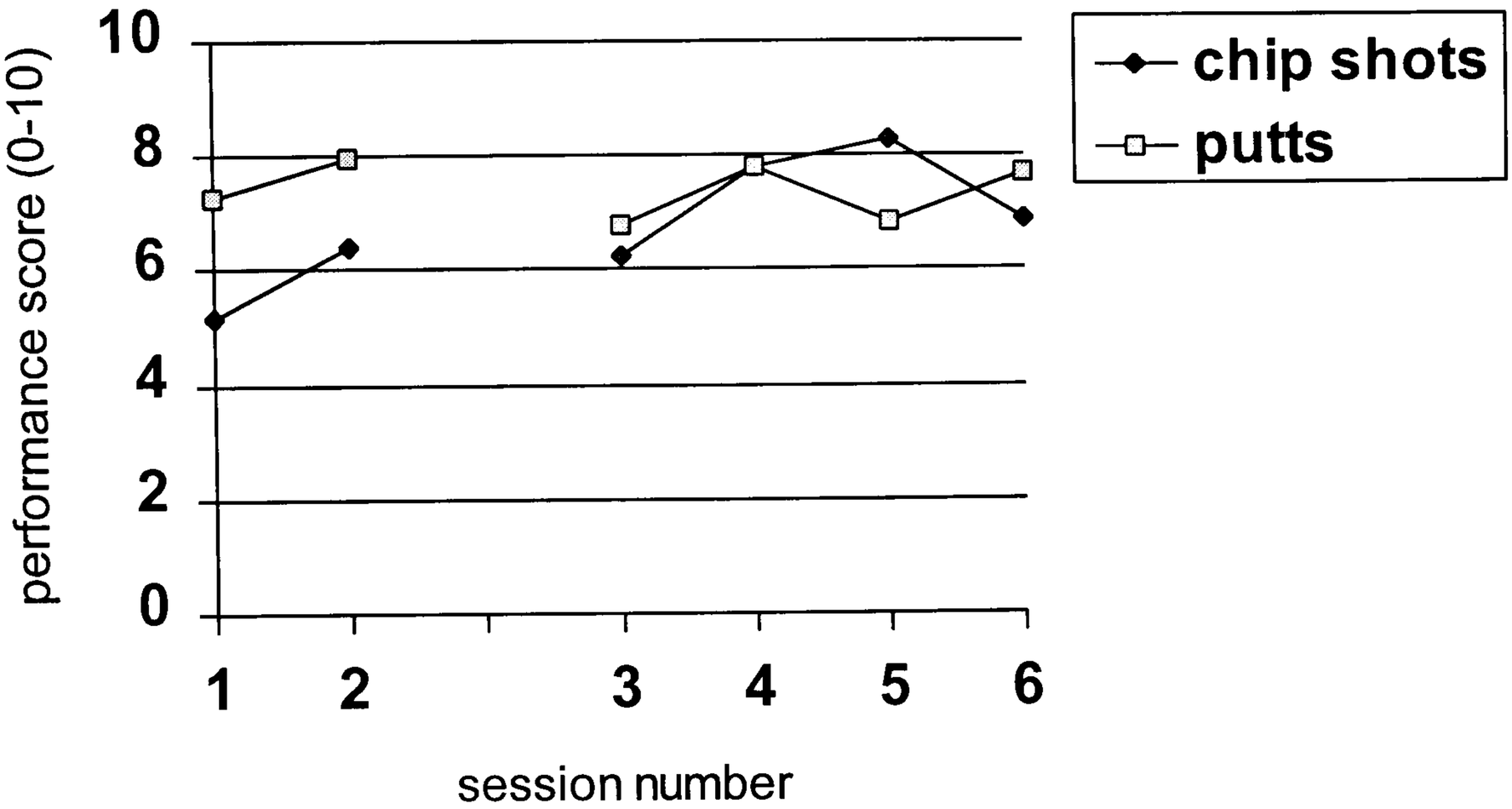
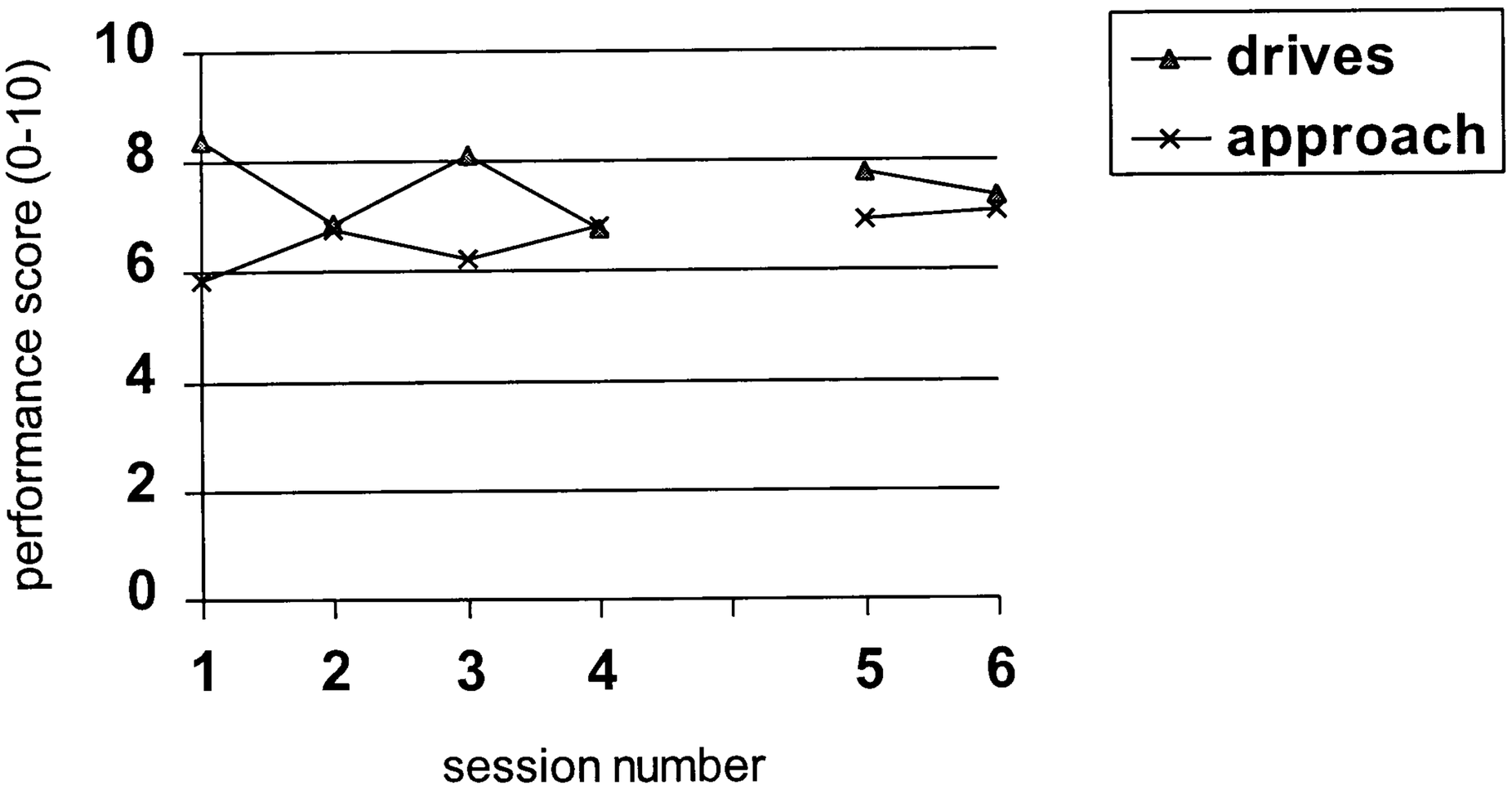


Figure 2 Performance scores for drives and approach-play



N.B. Intervention initiated between sessions 2 & 3 for chips and putts, and between sessions 4 & 5 for drives and approach play.

Timing error (mean absolute error of completed putting routine in seconds)

The one-way analysis of variance on the absolute values of the difference from the session mean (in seconds) for the routines for each shot type revealed a number of significant results. There were significant differences in absolute error for putts, $F(6,107) = 5.56$, $p<.001$; for chip-shots, $F(5,46) = 3.77$, $p<.01$; and for approach-shots, $F(6,103) = 2.38$, $p<.05$ (see Table 5).

Table 5 Means and Standard Deviations for Timing errors (seconds)

	Session					
	1	2	3	4	5	6
Drives	1.55 (1.33)	1.70 (1.11)	1.32 (1.81)	1.54 (1.30)	.93 (.65)	.64 (.48)
Approach	2.42 (1.92)	1.93 (1.50)	1.58 (1.24)	1.45 (1.11)	1.12[1] (0.87)	1.00[1] (0.84)
Chips	2.07 (.85)	1.98 (1.08)	1.75 (1.99)	.88 (.78)	.26[1] (.25)	.50 (.45)
Putts	1.46 (1.06)	2.06 (1.43)	1.53 (1.45)	.80[2] (.99)	.42[123] (.33)	.61[2] (.39)

[1] significantly < Session 1;[2] significantly < Session 2;[3] significantly < Session 3

For putting, Tukey's post-hoc tests indicated that mean absolute errors (time) at Sessions 4, 5 and 6 were significantly lower than at Session 2; and mean absolute errors at Session 5 were also significantly lower than at Sessions 1 and 3 (see Figure 3). For chip-shots, post-hoc tests indicated that mean errors (time) at Session 5 were significantly lower than at Session 1 (see Figure 3). For approach-play, the mean errors at Sessions 5 and 6 were significantly lower than at Session 1 (Figure 4).

Figure 3 Mean absolute error for chips and putts

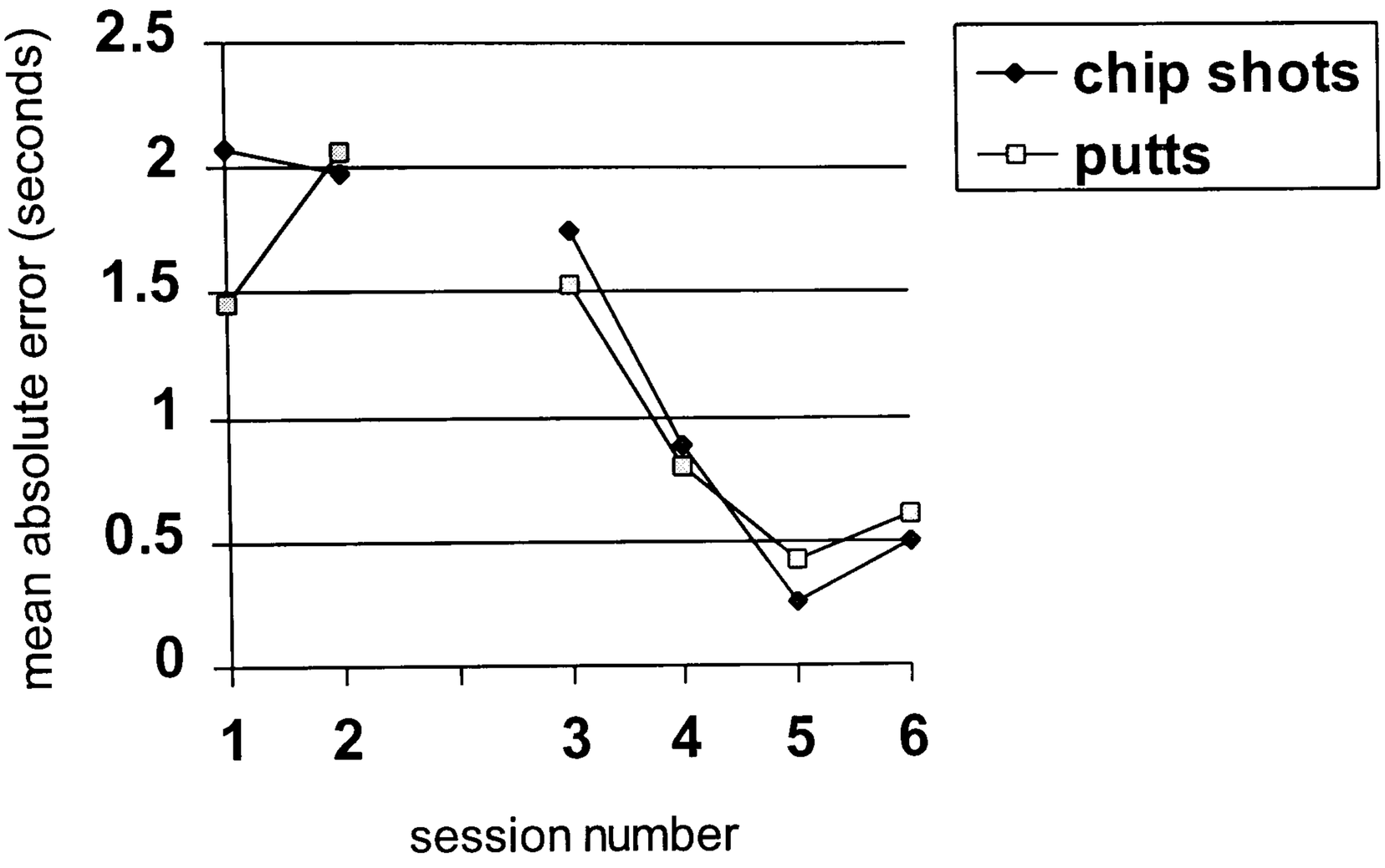
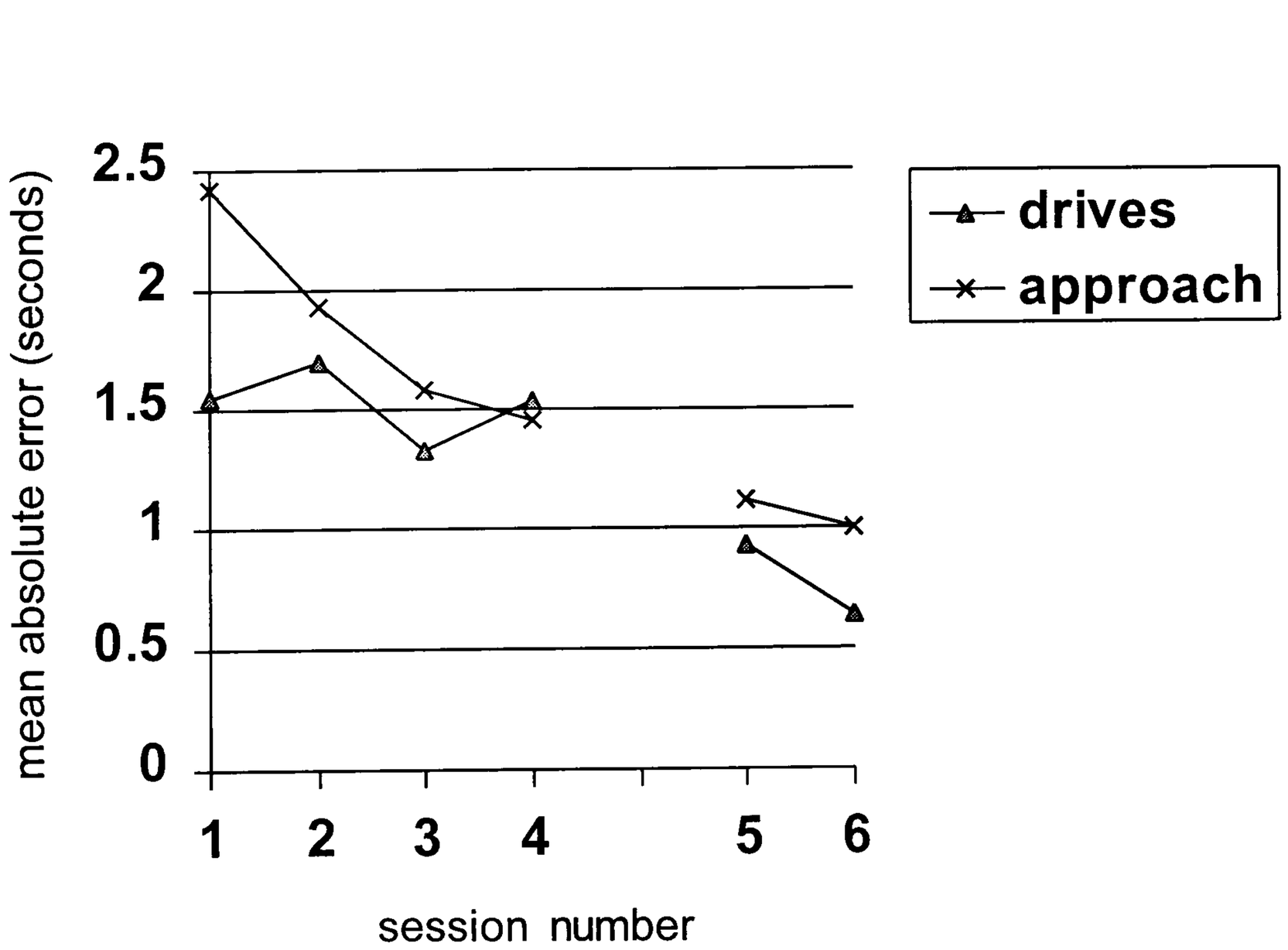


Figure 4 Mean absolute error for drives and approach play



N.B. Intervention initiated between sessions 2 & 3 for chips and putts, and between sessions 4 & 5 for drives and approach play.

Discussion

Although, it can be criticised at a number of the levels, the multiple-baseline design used for this study provided an opportunity to assess the effectiveness of an intervention aimed at refining the pre-performance routines of the golfer across different aspects of his game. In addition to the methodological justifications for using such a design, the advantages of this approach (in this case) were: it enabled the client to first work on routines in the areas of his game that were perceived as requiring the most urgent attention; and refining routines in all aspects of the game simultaneously would have been extremely complicated and daunting for the client. The results presented provide some evidence that the pre-performance training intervention had the effect of reducing the variability in the timing of pre-performance routines, specifically, with regards to putting and chipping, and to a lesser extent with approach-shots. It was somewhat disappointing (if not entirely unsurprising), that these reductions in variability were not paralleled with performance improvements. Furthermore, it is perhaps meaningless to attempt to infer any type of causal relationship because the correlations between the variability in timing of the routines and performance were non-significant ($p<.05$) for three out of the four aspects of golf performance. The only significant correlation was for chip-shots, where a negative correlation existed between mean absolute error (time) and performance ($r=-.31$, $p=.037$). The lack of an apparent association may be a consequence of the somewhat subjective nature of the performance measure used. Nevertheless, it was encouraging to find that perceived performance was improved on two occasions following the intervention (for chip-shots) albeit with marginal significance. It is interesting to note that the most pronounced changes in variability

of the routines over time were in those areas of the game (putting and chip-shots) which had originally been targeted as areas of weakness in the clients game. It could be argued, however, that the greater length of time spent using the refined routines for chipping and putting may have increased the likelihood of observing more pronounced behavioural effects.

While it is clear that one has to give temporal consideration to the uptake and impact of pre-performance routine training, this does not necessarily mean that routine training which has yet to elicit a state of automaticity is not of benefit. Indeed, especially for less able performers, it is clear that automatisation is unlikely to follow as an immediate consequence of routine adoption or modification. The very nature of routines encourages a strong process focus; moreover, most routines involve some sort of setting/relaxation strategy that should help the performer attain an appropriate activation level that further increases the potential for optimal execution of a specific skill. It may also be the case that some golfers become so absorbed in their preparation and the execution of each shot (to achieve a particular objective) that nothing can penetrate their focus during the task (Cohn, 1991). Murphy (1994) in his discussion of the concept of flow in golfers, indicated that as attention is absorbed in the activity, there is no excess attention left to engage in worry or self-doubt, and flow is likely to occur. None of these benefits are necessarily precluded by a failure to achieve a state of automatic functioning.

One of the more important practical implications of the current research relates to the possible time-lag between acquiring and refining pre-performance routines, and the realisation of any discernible improvement in performance. Beauchamp et al. (1996) and Cohn et al. (1990) for example, have indicated that

immediate improvements in performance were not consistently demonstrated after the introduction of a pre-performance routine training treatment. It may simply be the case that until the routines are well learned, the high level of cognitive resources required precludes performance benefits. Shambrook and Bull (1996) intimated as much when suggesting that drops in the rate of improvement in basketball free-throw shooting may be caused by adjusting to a new pre-shot routine. The implication for coaches and performers is that routine development and refinement should take place when the frequency of competitions is low and the opportunity to practice is high, for example during the off-season. Alternatively, it may be necessary for performers to recognise that they may experience short-term decrements in performance as their routines are refined or developed.

Similarity in the timing of routines supports the notion of a consistency in the use of specific cognitions and the sequencing of behaviours which constitute the routine (Crews, 1994). The results from the current study therefore provide some evidence that the client's behaviour and cognitions have become more consistent, at least across some phases of his golf game. According to Crews, consistent behavioural and cognitive patterns facilitate a consistent psycho-physiological state which is conducive to best performance. Southard, Miracle and Landwer (1989) described the objectives of such ritualised behaviours as being consistency of duration, and consequential reductions in the variability of performance. Consequently, it is reasonable to surmise that increased consistency (in time to complete the routine) may be an initial step towards realising performance benefits.

Although the subjects in Cohn et al.'s (1990) study did not consistently demonstrate immediate improvements in performance, post-treatment interviews

indicated that the golfers perceived the intervention to have had a positive effect upon performance. This highlights an interesting issue. Although immediate improvements in performance may not be realised, it may be more important that the athletes actually perceive that they are making a progression towards enhanced performance. The implications in terms of adherence to mental training programmes are obvious, it also implies that we as practitioners should make more explicit the short-term goals of the interventions we suggest as well as the additional benefits of utilising such routines. For example, routine training may help to focus attention, increase adherence to routines, enhance self-confidence, increase intrinsic motivation and reduce controlling tendencies (see, for example Cohn et al., 1990).

One of the principal shortcomings of the present study was the lack of reliable performance data. Asking the performer to subjectively assess performance on each shot after a completed round (which may take up to four hours) is somewhat problematic, most notably because the golfer's perception of performance on each shot is likely to be influenced by a number of factors independent of that shot (for example, where the ball came to rest, the final score achieved on the hole, etc.). Furthermore, it is necessary to ensure that each performance measure is assessed using consistent criteria. It is clear that the effective assessment of performance (perhaps including more objective methods) has to be balanced with the need to ensure that such measures do not impinge on the task performance. A more serious limitation with this particular study is the lack of detailed data over a protracted period of time. The limited time period over which it was possible to intervene and collect data means that longer-term effects of the intervention could not be determined. It is not always possible to control the motivational processes of

participants in case-studies such as this. The participant in this case appeared to become de-motivated with regards to the intervention programme once short-term improvements in performance were not realised. As discussed previously, it is important that clients have realistic expectations with regards to the intervention. Further, they should be made aware of the difficulty in effecting immediate changes in performance levels.

It is apparent from the previous discussion that research in several areas would help to benefit our understanding of the mechanisms which underlie the effectiveness of pre-performance routines in sport. A more detailed understanding of these will enable practitioners to more effectively base routine development on the nature of the sport and individual differences in performers. Of particular salience to the current study is a more detailed understanding of the factors that contribute to the adherence of the performer to pre-performance routines, most notably when under competitive stress. An explicit focus on developing trust and self-confidence within the athlete (Moore & Stevenson, 1991), as well as incorporating strategies to reduce competitive anxiety are likely to reduce the tendency of the performer to undermine the automatic nature of their routine by attempting conscious control. Associated with this is the issue of persistence, most notably when immediate performance improvements are not realised. Bull (1991) has highlighted the importance of personal and situational factors (e.g., self-motivation) in predicting mental-training adherence. Therefore, it is vital to understand how, as psychologists we can structure pre-performance routine training in order to maximise the likelihood of persistence/adherence and reduce the latency of positive performance effects

One area of research that has received increased attention in recent years is in the area of process oriented goals. It is clear from the work in this area that a natural evolution in effectively using specific process goals is to 'chunk' processes together into a coherent routine that can be represented by a more holistic representation of the to-be-performed skill (Kingston & Hardy, 1994; 1997). This provides a link to those pre-performance routines which were initiated using a general as opposed to a specific cue word or thought. Consequently, it would be reasonable to suggest that the mechanisms thought to underlie the effectiveness of process oriented goals might also in part contribute to the positive impact of routines, especially if initiated using a cue which has a holistic focus. It may simply be that novices benefit from the increased attentional focus brought about by using single process goals. For more able performers, pre-performance routines containing or initiated using holistic process oriented goals may provide an equally strong process focus, yet prevent the focus on specific aspects of the skill which have been shown to undermine automaticity and hence skilled performance (Baumeister, 1984; Masters, 1992). This certainly helps to explain the paradox that has been identified between process oriented goals and conscious processing (see Hardy et al., 1996a; Hardy et al., 1996b). More detailed (longitudinal) studies into the effects of process goals and pre-performance routines on performance, cognitions and affective variables might help to address the issue of the efficacy of pre-performance routines as a function of skill level.

In conclusion, the current study, although not without it's limitations, goes some way to providing a rationale for using holistic process goals as an inherent part of the development of pre-performance routines. Although performance

improvements were not manifested, increasing the stability of routines is likely to represent some sort of a precursor to future performance benefits. Nevertheless, the lack of performance effects, and the apparent demotivated state of the participant following the end of the study do elicit some concern. Attributing these effects to the intervention is, however, somewhat problematic.

Chapter 5

Situational influences on goal orientations amongst golfers of different ability levels.

Abstract

The Task and Ego Orientation in Sport Questionnaire (TEOSQ) is increasingly utilised as a measurement tool of individuals' dispositional tendencies towards task and ego perspectives in achievement situations. A disposition, by definition relates to; a tendency, inclination or habit, and thus, unlike a trait (defined as a stable characteristic) may be prone to variations. The primary purpose of this study was to examine the situational stability of goal orientation profiles for golfers of different ability levels. Seventy-nine male golfers in four ability groups completed TEOSQ on three separate occasions throughout the course of the year: pre-season; one-day prior to practice; and one day prior to a major competition. The two-factor (group by situation) ANOVAs performed on the task and ego orientation data revealed significant interactions ($p < .01$). These results and Tukey's post-hoc tests suggest that the way in which athletes conceptualise ability (the dispositional goal orientations measured using TEOSQ) change in a systematic manner across different naturally occurring situations, and that skill level has a moderating effect on the proneness of an individual to such variations.

Introduction

Goal perspective theory (Ames, 1992; Dweck & Leggett, 1988; Nicholls, 1989, 1992) argues that there are two major goal perspectives operating in achievement contexts. The first goal perspective, labeled task involvement, (Nicholls, 1989) operates when an individual construes his or her level of competence based upon some self-referenced criteria. The second goal perspective, labeled ego involvement, (Nicholls, 1989) operates when an individual construes subjective success based upon some normative reference, for example, exceeding the performance of others. For extensive reviews of goal perspectives theory and its application in athletic settings see, for example, Duda (1992; 1993; Duda & Whitehead, 1998), and Nicholls (1989; 1992).

The existence of dispositional goal perspectives in sport has been confirmed using the Task and Ego Orientation in Sport Questionnaire (TEOSQ) (Duda & Nicholls, 1992) which assesses individuals' proneness to be task and ego involved. The two-factor structure of the TEOSQ has been found to be stable, with two internally consistent, orthogonal, factors. The independence of these factors has been supported in studies of both elite and non-elite sport participants (Duda & White, 1992). Despite the fact that researchers often seem to refer to individuals as being either task or ego oriented (see, for example, Duda, 1992; 1993; Duda & White, 1992; Newton & Duda, 1995; White & Zellner, 1996), none of the studies into goal orientations offer any implicit support for this assumption of bipolarity. Indeed, on the few occasions when task and ego orientation are not close to orthogonal, they are positively, not negatively associated (Nicholls, 1992). The independence as opposed to bi-polarity of these dimensions is important, as it means that a given individual might be high or low in one or both of task and ego orientations simultaneously. Hence it is theoretically contentious to consider an individual to be *either* task or ego oriented.

An individual's goal orientation is a reflection of the predisposing tendency to be task and ego involved in achievement situations (Nicholls, 1989). An

achievement situation is any context in which an individual's criterion for success is challenged. Task and ego involvement relates to state goals, whereas the orientations that people hold relate to more stable dispositions about that sport activity in general terms (Duda, 1989). Dispositions are individual difference variables that determine the *a priori* probability of adopting a particular goal and displaying associated behaviours. According to Dweck and Leggett, (1988) situational factors have potential to alter these probabilities. In short, an individual's goal orientation interacts with the situation to determine the 'state' involvement that one holds, which in turn is reflected in the specific goals that are set, performance and associated attributions (Burton, 1992). The relative strength of individuals' goal orientations will determine the extent to which the nature of the situation impacts upon the individual's dispositional tendencies (Dweck & Leggett, 1988). Ames (1992), adopts a similar argument to Burton, but refers to the situation and environmental characteristics as shaping a 'motivational climate', which emphasise, or has a bias towards a task or ego type of involvement. It is of practical significance to understand the extent to which situational variable's influence goal orientations if one is interested in promoting adaptive states of involvement. For example, supposing a combination of low task and low ego-orientation had a negative impact upon performance (via their associated state of involvement), it would be important to predict the extent to which competition moderates this effect (as a consequence of the situation by disposition interaction).

It is clear from the above paragraph, that situational variables play an important role in determining a performer's 'state' of involvement. Furthermore, it would be reasonable to suggest that the disposition by situation relationship with states of involvement might be moderated by a variety of other internal factors. One such factor might be ability, since clearly skill and experience have the potential to determine the extent to which performers implement adaptive strategies to overcome or cope with the fluctuating demands of changing situations. Although elite athletes experience self-doubts, they regularly demonstrate the capability to more effectively

deal with the pressures of the competitive environment than their less illustrious counterparts (see Hardy et al. 1996a). It can be hypothesised, therefore, that the goal-orientation profiles of elite performers are generally more adaptive (across a variety of situations) than non-elite athletes.

With regards to the specific patterning of the goal profiles, Fox, Goudas, Biddle, Duda and Armstrong (1994) found that higher level performers possess a combination of high ego and high task orientations simultaneously. A number of applied researchers have drawn similar conclusions following interviews with elite performers (see Jones & Hardy, 1990; Orlick & Partington, 1988; Hardy et. al., 1996a). Of course, the cause of simultaneously high levels of ego and task-orientations can only be inferred. Without the use of path analysis or longitudinal designs, it is difficult to detect whether such performers are elite because of an appropriately high level of task and ego orientation, or whether their consistent high levels of performance, and favourable social comparison has led to their high task/high ego orientation profile. The examination of profiles as a function of ability is of interest because of the emphasis that much of the goal orientation literature places on reducing ego orientations. Similarly, the call for the denigration of high ego orientations is intuitively questionable as it does not sit comfortably with views received from coaches and performers that, "you don't get to be a world champion by not wanting to beat other people" (Hardy et al., 1996a, p.78). Indeed, an examination of the extant literature reveals that only high ego orientations combined with low perceptions of ability have serious negative motivational consequences.

Nevertheless, the general finding reported within the goal perspectives literature that high levels of ego-orientation have a negative impact upon motivation is sometimes claimed to be mirrored in actual performance (e.g., Nicholls, 1989; Duda, 1992). However, preliminary studies utilising a profile approach to studying goal orientations suggest only that, independent of the degree of ego orientation, low levels of task orientation have negative implications for performance (Roberts, Treasure & Kavussanu, 1996).

If one accepts the notion of a situation by disposition interaction, and that this impacts upon goal-setting practices (Burton, 1992), then it should be possible to predict (for any given situation) the type of state goals that individuals with a given dispositional profile are likely to set. The reason for this is that the distinction between ego and task orientation in the goal perspectives literature (see Duda, 1992, p.58) parallels the distinction between outcome and performance/process goals in the goal-setting literature. Hardy et al. (1996a), have suggested that, predominantly ego oriented performers are more likely to favour outcome goals, whilst predominantly task oriented performers are more likely to favour utilising performance or process goals. It should therefore follow that performers strong in both task and ego orientations would set all three types of goals, and thus have the greatest likelihood of adopting adaptive goal-setting strategies across a variety of situations (Kingston & Hardy, 1994). It should be acknowledged that the extent to which these predictions hold may be determined by the proclivity of the prevailing situation to moderate the beliefs that performers hold (see Dweck & Leggett, 1988).

If one aim of sport psychology practitioners is to encourage the use of adaptive goal-setting practices, it is important to determine the extent to which a dispositional profile remains robust in some circumstances yet is compromised in others. Furthermore, it is important to more fully understand those factors within the situation that may lead to changes in individual conceptions of ability. For example, a talented club athlete may possess simultaneously high levels of task and ego orientation prior to club competition, yet may place less of an emphasis on exceeding the performance of others when competing at national level. Alternatively, one could argue that an individual who is highly task oriented possesses a strong internal locus of control (Dweck & Leggett, 1988) which would preclude the competitive situation from impacting upon that person's goal orientation. Competitive sport, by its socially evaluative nature fosters an ego-involving 'competitive' motivational climate, and thus the orientation held in such situations may not reflect the disposition held by that individual across other circumstances. Moreover, only those with appropriate

control strategies, or a strong resilient task orientation would be predicted to override the ego involving nature of competitive sports environments and maintain an appropriate 'adaptive' perspective (i.e. avoid excessive preoccupation with self-evaluation, and the social factors present in competition environments).

The purposes of this exploratory study were therefore: to examine whether task and ego orientations change systematically across naturally occurring situations; and to determine if these variations are influenced by ability.

Method

Participants

A total of 79 male golfers from British golf clubs in Cheshire, Derbyshire and North Wales participated in this study. Specifically, the sample comprised four distinct groups. Group 1 consisted of club professionals (n=13). Group 2 consisted amateur county golfers with handicaps ranging from +2 to -2 (n=17). Group 3 consisted of club golfers with handicaps ranging from minus 6 to 10 (n=21). Finally, Group 4 consisted of club golfers with handicaps of between minus 20 to 28 (n=28). Participation was voluntary, and participants were required to complete a single thirteen-item questionnaire on three occasions throughout the year.

Instrumentation

The Task and Ego Orientation in Sport Questionnaire (TEOSQ) TEOSQ (Duda & Nicholls, 1992), was developed to assess individuals' proneness for task and ego involvement in the athletic context. TEOSQ is a modified, sport specific version of the inventory developed by Nicholls and his colleagues to assess task and ego orientation in the academic context (Nicholls, 1989). TEOSQ asks subjects to respond to the statement, "I feel most successful in golf when....", and to indicate the extent of their agreement with 13 items reflecting a task and ego orientation view of subjective success. The items are, at times reworded to reflect the specific sport in which the subjects are involved. Scores on the TEOSQ are calculated using a mean for each of the two sub-scales. Duda (1992) reported that the orthogonal task and ego

orientation sub-scales have been found to have satisfactory internal consistency (alpha coefficients ranging from 0.81-0.86 and 0.79-0.90, respectively). Furthermore, Duda & Whitehead (1998) have reported acceptable test-retest reliability (0.68 for the task orientation scale and 0.75 for ego orientation following a three-week period).

Procedure

Participants were required to respond to the Task and Ego Orientation in Sport Questionnaire (Duda & Nicholls, 1992) on three separate occasions. The first occasion was in the middle of the closed season for golf (pre-season) when subjects were neither practising nor competing on a regular basis. The second occasion was the day prior to beginning practice for a major competition (pre-practice), this was typically 5-6 days prior to a relatively (depending on the ability of the subjects) high-status competition. Finally, approximately 3-4 weeks later, subjects were asked to complete the questionnaire one-day prior to a second major competition. On each occasion, participants completed the questionnaire in the privacy of their own home, without any assistance.

Results

Two factor (group by situation) analyses of variance (ANOVA) with repeated measures on the second factor were conducted on the task and ego orientation data. The decision to use multiple ANOVAs rather than a multivariate analysis of variance (MANOVA) was based on the two sub-scales of the TEOSQ being orthogonal (independent) in nature (Duda, 1992), and the experimental hypotheses also being independent as opposed to multivariate in nature (Schutz & Gessaroli, 1987). However, in order to reduce the likelihood of committing Type 1 errors, a protected alpha ($p=.01$) was used.

Ego orientation

The group by situation repeated measures ANOVA indicated a significant interaction for the ego orientation sub-scale of TEOSQ ($F(6,150) = 8.74$, $p < 0.001$). Tests of simple main effects, together with Tukey's test of Honestly Significance

Differences (HSD), were used to identify cell mean differences that contributed to the significant interaction (Winer, 1971). These indicated that, for both Group 1 (professionals) and Group 4 (20-28 handicap players), ego orientation was elevated pre-competition compared to the two other situations (see Table 6). There were no significant differences across situations for the other groups. There was also a significant main effect for group ($F(3,75) = 5.89$, $p < 0.001$), with post-hoc tests indicating higher levels of ego orientation for the professionals and low-handicap golfers compared to the intermediate and high-handicap golfers. The significant main effect ($F(2,150) = 43.76$, $p < 0.001$) for situation indicated that, the pre-competition levels of ego orientation were higher than those associated with the other two situations. However, due to the presence of the significant interaction, these main effects should be interpreted with caution.

Task orientation

A group by situation ANOVA also produced a significant group by situation interaction for the task orientation sub-scale of TEOSQ, ($F(6,150) = 3.49$, $p < 0.01$). Tests of simple main effects, together with Tukey's HSD tests, were again used to identify cell mean differences contributing to the significant interaction. These indicated that the 20-28 handicap players (Group 4) had significantly lower levels of task orientation pre-competition than any other group in any condition (see Table 7). However, no other groups experienced any significant changes in task orientation. A significant group main effect was also obtained ($F(3,75) = 16.59$, $p < 0.001$), with Tukey's HSD follow-up tests indicating that the two high ability groups (Groups 1 and 2) had significantly greater levels of task orientation than Group 3 and Group 4. Finally, there was a significant situation main effect ($F(2,150) = 12.13$, $p < 0.001$), which Tukey's HSD follow-up tests indicated was due to a lower level of task orientation pre-competition. However, these main effects should again be interpreted with caution because of the existence of a significant interaction.

Table 6 Means and Standard Deviations for Goal Orientation levels across situations

	TASK ORIENTATION			EGO ORIENTATION		
GROUP	pre-season	pre-practice	pre-competition	pre-season	pre-practice	pre-competition
1 (Professionals)						
	3.98	3.71	3.55	3.63	3.36	4.30
	(.47)	(.32)	(.42)	(.74)	(.31)	(.28)
2 (County Amateurs)						
	3.92	3.96	3.93	3.71	3.75	3.67
	(.36)	(.32)	(.36)	(.94)	(.68)	(.48)
3 (6-10 Handicap)						
	3.55	3.50	3.36	3.17	3.06	3.62
	(.54)	(.45)	(.44)	(.72)	(.54)	(.55)
4 (20-28 Handicap)						
	3.43	3.42	2.84	2.93	2.75	3.95
	(.41)	(.49)	(.81)	(.67)	(.69)	(.52)

Discussion

The primary purpose of this study was to determine whether conceptualisations of ability (which according to the development of TEOSQ are reflected by conceptions of criteria for success) change across a variety of naturally occurring situations. Its second aim was to determine if goal orientations and the patterns of systematic change differed according to the ability levels of the performers.

Although TEOSQ is viewed as a tool for measuring dispositional goal orientations, this study's findings support the hypotheses that, rather than being stable, the levels of task and ego orientations are susceptible to changes across situations. This indicates that conceptualisations of ability change in a systematic fashion. Furthermore, the results also provide support for the contention that ability has a moderating effect on proneness to such variations (since the level and nature of change appears to be 'buffered' by the ability level of the participants).

The analyses indicated that the higher ability (professionals and county) players displayed higher levels of task and ego orientations overall independent of the situation (demonstrated by the group main effects for both task and ego orientation). However, at a specific level, both the professional golfers and the lowest ability group (20-28 handicaps) experienced a significant increase in their proneness towards an ego-based conception of ability pre-competition. There were no differences across situations for the other groups. With regards to the task dimension of TEOSQ, the lowest ability group (Group 4) experienced a decline in task orientation levels prior to competition. In contrast to the results for ego orientation, however, there were no changes for the other ability groups, including the professionals.

With the emphasis that competition places on social comparison (and hence ego involvement), it is perhaps not surprising that the prospect of competition causes some performers to modify their conceptions of ability relative to more 'neutral' situations. From a measurement perspective this finding appears to question the ability of measurement tools such as TEOSQ to effectively measure what are

supposed to be relatively stable dispositions. The results clearly indicate that as a measurement tool, TEOSQ is prone to situational interference. However, it should be noted that the disposition by situation interaction hypothesis would lead one to expect inconsistency in responses across situations where the strength of cues (emphasising a task or ego type of involvement) are different. The power of dispositional variables lies in their ability to predict patterns of behaviours and cognition's across various situations, not in their prediction that the same patterns are displayed across these situations (Dweck & Leggett, 1988). It may be that respondents report the type of involvement preferred in the specific context in which TEOSQ is administered, rather than an overall trait preference. This could of course be a reflection of the lack of construct validity for TEOSQ in competitive sport situations, moreover, these results emphasise the need to develop valid and reliable measures of state goal perspectives.

Competitive sport is, by its nature often associated with high levels of social evaluation. Consequently, the increases in ego orientation elicited for Groups 1 and 4 may not be completely unexpected. However, contrary to this logic, the county amateur players (Group 2) and the 6-10 handicap players (Group 3) appear immune to such rises (see Table 6). Although, these results appear somewhat at odds with expectations (i.e., one night expect differences across all groups), Hardy (1997) suggested that such variations may represent qualitatively different approaches to competition. The gifted amateurs (Groups 2 and 3) may try to treat competitions as though they are "just another round". The professionals on the other hand, may try and use competition as an additional source of motivation, and hence consciously elevate the social relevance of the competition with the effect of inducing a more ego involved state (perhaps without any detrimental effect on task involvement). Finally, the high handicap golfer may find that a preference for an ego-type focus is a natural consequence of the prospect of competition, to the direct detriment of their task focus.

Although actual and perceived ability are not always congruent, it is logical to make the supposition that (compared to high ability performers) lower ability performers generally have lower perceptions of competence. Consequently, we might

expect that the high levels of ego orientation and a consequent focus on an ego type of involvement would be associated with poor performance for this group (see Duda, 1992). However, this potentially negative effect on performance may be as much related to an inappropriate reduction in task focus, (as experienced by the lower ability group) as to an elevation of the status of various social comparison processes. According to Swain and Harwood (1996), for individuals of lower perceived ability, the reduction of task orientation may be the result of indifference towards situations where competence is likely to be questioned. On the other hand, professionals (presumably holding higher levels of perceived competence) who experience increases in ego orientation may control any potentially negative effects of such an ego focus by maintaining their high level of task orientation, and ensuring its prioritisation. Indeed, a number of studies have supported the motivational and performance efficacy of simultaneously high levels of task and ego orientation for high level performers (e.g., Fox et al., 1994; Roberts et al., 1996).

In spite of the elevation in ego orientation which accompanies the prospect of competition, elite performers may be able to control against a potential preoccupation with social comparison based thoughts by adopting learned control strategies during the actual competition. The use of strategies to help maintain an appropriate focus during competition has been well documented. For example, studies with elite golfers (Cohn, 1991; McCaffrey & Orlick, 1989; Thomas & Over, 1994) have indicated that such players have highly developed and rehearsed plans for maintaining and refocusing attention.

While competition may lead to an elevation in levels of ego orientation or a tendency for ego involvement, it could be argued that practice should have similar effects upon task involvement (and perhaps encourage a process focus). This view has been supported in interviews with performers (see, Hardy et al., 1996a; Jones & Hardy, 1990; Orlick & Partington, 1988). For example, when asked about his goals for a training session, Steve Backley (Javelin) replied that he had a goal of:

> "just trying to be technically proficient in the throw. It would always be something technical . . . I might want to feel a driving across the ground as I'm throwing rather than block and throw . . . I want to throw technically proficiently, and I want my coach to say 'You look sharp' to make me feel as if I'm improving." (Jones & Hardy, 1990, p. 260)

Although, both Hardy and associates and Orlick and Partington, reported exclusively on world class performers, many of their interviews clearly showed the explicit process focus that is often adopted by the athletes in training. It could be argued, however, that because of what is often regarded as "sport's pervasive preoccupation with winning." (Burton, 1989 p. 105), it is probable that competition will elicit an increase in ego focus to a greater degree than practice would elicit an increase in task involvement (self-referenced focus).

It is also interesting to note that lower ability performers, in addition to their reported elevation of ego orientation with the prospect of competition, also demonstrated a significant reduction in task orientation. As has already been stated, the two dimensions of TEOSQ are orthogonal in nature (see Duda, 1992). Supporting this notion, the results of the present study clearly indicate that individuals may hold high and/or low levels of both task and ego orientations simultaneously, rather than simply having a dominant orientation. However, since the results for the lower ability group appear to show an elevation in ego orientation corresponding with a reduction in task orientation there may be an interactive effect between the two dimensions of TEOSQ in certain situations. What is of particular interest is that this pattern of results was not reciprocated for the professionals, who, while experiencing a similar increase in ego orientation levels to the lower ability group, maintained their strong task perspective prior to competition. The efficacy of maintaining a strong task orientation, particularly for competitive performance has been well documented, as has the potential for debilitating effects from an overriding ego orientation, especially in low perceived competence performers (see, Duda, 1992; 1993; Nicholls, 1989). It is

reasonable to speculate that a pre-occupation with the social comparison factors associated with competition can detract from the task involvement of lower ability performers in particular. Moreover, it may be that the higher ability golfers manage to maintain their high levels of task orientation pre-competition due to continued exposure to these situations and consequent acquisition of control strategies. The extent to which an individual has a preference toward a task and/or ego oriented perspective may well be a product of the degree of exposure to certain motivational climates, and the extent to which these have been socialised (Ames, 1992; Nicholls, 1989).

To conclude, the current study supports the contention that goal orientations change systematically across situations and that TEOSQ, while predominantly utilised as a dispositional measure is by no means robust to situational changes. The results also re-emphasise the predominance of high task/high ego profiles for expert performers (i.e., both high ability groups had significantly higher levels of task and ego orientations than the two lower ability groups). Furthermore, while individual goal orientations have not been found to correlate strongly with perceived ability (Duda & Nicholls, 1992), it may be that actual ability moderates the impact of the situational variables upon goal orientations and associated states of involvement. Finally, these findings emphasise the need for a valid and reliable measure of goal-states, this in turn should lead to a more parsimonious understanding of the relationship between goal orientations and states of involvement.

Chapter 6

Do goal orientation profiles influence competition performance?

Abstract

The orthogonality of task and ego orientations as measured using Duda and Nicholls (1992) Task and Ego Orientation in Sport Questionnaire has been consistently demonstrated within the goal perspective literature. The implication of this orthogonality is that a given individual can possess a dispositional goal orientation 'profile' comprising of high or low levels in one or both orientations. There is some evidence to suggest that goal orientations measured using TEOSQ are not situationally robust (Kingston & Hardy, 1998). The primary purpose of this study was to determine whether pre-competition combinations of high and low levels of task and ego orientations differentially effected competition performance (i.e. can purported dispositions influence state performance in a competitive situation?). One-hundred and seventy-three mixed-ability golfers completed the TEOSQ one day prior to a major golf competition. Two-factor (quadrant) analysis of variance revealed a significant interaction ($p < .05$) with follow-up tests indicating that those individuals with a high ego/low task profile performed significantly worse than those holding other profiles. The results suggest high levels of ego orientation per se do not appear to have damaging effects upon performance. These findings support the views of many coaches and practitioners (see, for example, Hardy, Jones, & Gould, 1996a; Jones & Hardy, 1990; Orlick & Partington, 1988).

Introduction

Utilizing a social-cognitive approach to achievement motivation, Goal perspectives theory (Ames, 1992; Dweck & Leggett, 1988; Nicholls, 1989, 1992), stemmed primarily from classroom-based studies. However, the recent development of a more cognitive-based approach to motivation within sport settings has resulted in a considerable amount of research based upon Nicholl's theoretical model. According to Nicholls' (1989) theory, there are two major goal perspectives operating in achievement-related contexts. The first, labeled task involvement, operates when an individual construes his or her level of competence based upon some self-referenced criteria. The second goal perspective, ego involvement, operates when an individual construes subjective success based upon a normative reference, for example, exceeding the performance of others (Duda, 1992).

An individual's goal orientation is the predisposing tendency to be task and/or ego involved in achievement situations, and reflects how competencies are judged and success and failure defined. Nicholls (1989) has indicated that in the absence of strong situational cues the specific state goals that one adopts reflect the individual differences in proneness to be task or ego-involved (their goal orientation). Similarly, Dweck and Leggett (1988), argue that individual differences in the proneness to be task or ego involved together with the nature of the situation determine the probability of adopting certain goals, and displaying behaviors in relation to those goals. An individual's state of involvement is thus a consequence of an interaction between dispositional orientation and the situation (see Burton, 1992; Duda, 1989; Swain & Harwood, 1996). Furthermore, the extent to which the state of involvement corresponds with the goal orientation profile depends upon the strength of the

individual's predisposition and the strength of the situational cues to support or undermine the predisposed tendency (Dweck & Leggett, 1988; Swain & Harwood, 1996). As a consequence it would be logical to suggest that state goals should correlate strongly to the dispositional orientation when the situational structure (often referred to as the motivational climate) is conducive to both types of involvement, or is insufficiently strong to override a resilient dispositional profile.

In an apparent oversimplification of the disposition-state link, it has been proposed that an individual's goals (a direct consequence of their type of involvement) should be consistent with their interpretations of (views about) the wider purpose of the achievement activity (Nicholls, Patashnik & Nolen, 1985; Nicholls, 1989). The predictive tendency of dispositional purposes to state goals has been supported with regard to task involvement in a sporting situation (Swain & Harwood, 1996). Duda (1992), appears to support this dispositional-state link (but for an ego orientation) when suggesting that, "it is also logical that an ego-oriented individual would tend to focus on competitive outcomes" (p. 63). Duda, however, does not state explicitly whether this is, or is not, the only goal that such an individual might adopt. Given the definitional focus of the two types of involvement, one might reasonably expect highly ego-oriented individuals with a low level of task orientation to focus principally upon outcome goals. Similarly, those with a high task orientation and a low ego orientation can be expected to focus on performance or process goals (Hardy et al., 1996a). This is not to suggest that such individuals focus only on such state goals, since the orthogonality of goal orientations renders this summation theoretically inappropriate. For extensive reviews of goal perspectives theory and its application in

athletic settings see, for example, Duda (1992), Nicholls (1989; 1992), and Roberts (1992).

In spite of these suggested links between dispositions and states, it is important to acknowledge that the most widely used measure of goal orientations, Duda and Nicholls, (1992) Task and Ego Orientation in Sport Questionnaire (TEOSQ), was devised as a dispositional measure which asked how performers generally feel about success in their particular sport. The rationale behind examining dispositional orientations (measured through TEOSQ) as possible factors affecting state performance is based on the research highlighted in the previous paragraph and two additional factors. Firstly, there is some evidence (Kingston & Hardy, 1998) that the way in which athletes conceptualise ability changes in a systematic fashion across different settings (i.e. dispositions measured using TEOSQ are not stable across non-congruent settings). Secondly, there are at present no reliable and valid measures of state goal perspectives (Harwood, Hardy & Swain, in press). Although the mechanisms of effect can only be inferred (based on the hypothesised links between dispositions and state goals), it is meaningful to determine the possible links between goal orientations and performance in certain situations. Furthermore, the present study does not discount the fact that situational factors interact with the dispositional orientation to determine goal states. Rather, it is proposed that a situation which provides the opportunity for performers to realise personal success based on different conceptualisations of ability should elicit goal states congruent with dispositional orientations.

The 'goal perspectives' line of inquiry has provided some valuable insights into the behavioral and motivational associates of the two goal perspectives (Swain &

Harwood, 1996). However, a consistent flaw in much of the current goal orientations literature is in over-interpreting the case for denigrating ego oriented goals. Moreover, while there may be a paucity of empirical studies supporting the opposite, there is virtually no evidence that ego orientations per se have detrimental motivational consequences. Indeed, such a view is clearly not in accordance with the view received from coaches, performers and many sport psychology practitioners (Hardy et al., 1996a; Jones & Hardy, 1990; Orlick & Partington, 1988). Empirical evidence suggests that only a combination of high levels of ego orientation with low perceived competence have consistently been shown to have negative motivational consequences (see Duda, 1989; 1992; Hardy et al., 1996a). When ego involvement prevails and doubts about one's competence exist, a maladaptive behavioural pattern is predicted. It is labelled maladaptive because it is not conducive to long-term achievement and/or investment in achievement related environments (Duda, 1992). High levels of ego orientation also elicit increases in pre-competition state cognitive and somatic anxiety (c.f. White & Zellner, 1996), lead to low self-efficacy (Nicholls, 1989), and the denigration of the role of effort in performance in subjects who have a low perception of their own abilities (c.f. Duda, 1992). Conversely, a high as opposed to low level of task orientation has been linked to more adaptive achievement related behavioral patterns (Ames, 1992). Importantly, this positive behavioural pattern is predicted irrespective of an individuals level of perceived competence. Those with high task orientation have also been reported to demonstrate increased effort in order to achieve high levels of performance (Duda, Smart & Tappe, 1989) and to practice more in their free time (Duda, 1988). Furthermore, a task-oriented perspective is positively correlated with enjoyment, satisfaction from working hard, and pride in

ones accomplishments (Duda 1992; 1993), and negatively correlated with the tendency to have task-relevant worries (Duda, 1993).

Despite the orthogonality of the two goal orientations a substantial proportion of the empirical literature in this area appears to invest in discussions of subjects who are regarded as either predominantly ego or task oriented (see, for example, Duda, 1992; 1993; Duda & White, 1992; Newton & Duda, 1995; White & Zellner, 1996). At the very least these comparisons lead to confusion, but perhaps more importantly such comparisons are theoretically inaccurate (Hardy et al., 1996a; Hardy, 1997; 1998) as they negate the influence of the other level of goal orientation within the profile. None of the studies into goal orientations offer any support for a dichotomy or continuum of task versus ego orientation. Indeed, on the few occasions when task and ego orientation are not close to orthogonal, they are positively, rather than negatively associated with one another (Nicholls, 1992; Duda, 1992). In order to more fully understand the motivational implications of goal orientations a more appropriate approach would be to examine combined levels of task and ego orientations (e.g. Roberts, Treasure & Kavussanu, 1996).

The independence of task and ego orientation is important, it implies that a given individual might be high or low in both task and ego orientations simultaneously. More recently some research examining the cognitive and affective consequences of goal orientations in sport has focussed on the profile conception of goal orientations (e.g. Fox, Goudas, Biddle, Duda & Armstrong, 1994; Roberts et. al., 1996; Walling & Duda, 1995). In these studies, measures of task and ego orientation are used to classify a given individual into one of four sub-groups (High/Low task x High/Low ego). Although warranted on the basis of the orthogonality of the

orientations, classification according to a sample mean or median split may represent an over-simplistic or rather crude approach. One of the advantages of this approach, however, is that it enables researchers to perform a two-factor (2 x 2) quadrant analysis to test hypotheses about the interactive effects of task and ego orientations (Hardy, 1997). Alternatively, (and providing that the data and measurement tools satisfy the assumptions of such multiple regression procedures) a more sophisticated moderated hierarchical regression analysis could be used to examine the separate and interactive effects (Jaccard, Turrisi & Wan, 1990). The frequently used multivariate analysis of variance and multiple regression procedures do not (in their simplest forms) enable researchers to test hypotheses regarding the interactive effects of goal orientation profiles.

Empirical studies that have adopted the quadrant analysis approach in sport have primarily focused on the effects of the dispositional orientations upon motivational and affective variables. For example; satisfaction and beliefs about success (Roberts et. al., 1996); persistence and behavioural intensity (Duda, 1988); children's sport motivation (Fox et. al., 1994); and children's beliefs about success, interest in sport, and enjoyment (Duda, Fox, Biddle & Armstrong, 1992; Walling & Duda, 1995). Generally, the findings from these studies have supported the notion that high levels of task orientation are motivationally adaptive, irrespective of perceived competence and levels of ego orientation. It should follow therefore, that those individuals whose task orientation is insufficiently high (or robust) to override a high level of ego orientation are 'high-risk' in terms of motivational affect.

Although the effects of goal orientation profiles upon actual performance has rarely been addressed, preliminary research (e.g., Brunel & Avanzini, 1997), suggests

that differences in goal perspectives might help to predict variations in performance. Brunel and Avanzini suggested that being highly ego oriented in an elite sport setting should lead to better performance on the condition that athletes also exhibit a high task orientation. Hardy et al. (1996a), argue a similar point, in suggesting that a high ego orientation when combined with a high task focus fosters a positive motivational state and higher levels of performance. Outside of the competitive sport domain, Fox et al. (1994) identified that children with a high task/high ego orientation profile had higher perceived competence, enjoyed sport more, and participated more than those with simultaneously low levels of task orientation and ego orientation. Similarly, Walling and Duda (1995) reported that, students with low task and low ego orientation profiles had less adaptive beliefs about the causes of success and cognitions associated with participation in the sporting context. Roberts et al. (1996), found that those with high ego and low task orientation profiles (rather than simultaneously low levels of task and ego orientations) were more likely to exhibit motivationally inappropriate beliefs and cognitions.

Research in goal perspectives clearly advocates the notion of at least two distinct goal perspectives or orientations, and that the patterning or profile of these orientations has implications for both behaviour and affect. The current study sought to further address this question by determining whether the patterning of dispositional task and ego orientations one day prior to a competition affects subsequent performance in the competitive situation. It also examined whether consideration of the interaction between the two orthogonal goal orientations explains performance levels more effectively than the sum of the independent effects of the goal orientations using an appropriate statistical procedure. The relative dearth of studies in this area

makes specific hypotheses problematic, as does the absence of an appropriate measure of states of involvement. Nevertheless, research carried out on the cognitive and affective consequences associated with high and low levels of task and ego orientations (not always considered simultaneously) clearly provide some scope for speculation.

In general terms, the consensus that a high level of task orientation elicits motivationally appropriate cognitions (Fox et al., 1994; Roberts et al., 1996) should be reflected in a significant task main effect indicating that a high level of task orientation is desirable. However, because it can be surmised that holding simultaneously high levels of task and ego orientations is more adaptive (regarding beliefs about success and associated cognitions) than holding simultaneously low levels of task and ego orientation (Brunel & Avanzini, 1997; Fox et al., 1994; Hardy et al., 1996a; Roberts et al., 1996; Walling & Duda, 1995), and equally, that a high task and low ego orientation profile is more adaptive than a low task, high ego orientation profile (Fox et al., 1994; Roberts et al., 1996; Walling & Duda, 1995), the main effect may be confounded by a significant interaction.

Method

Participants

The participants in this study were 173 male golfers from British golf clubs in Cheshire, Derbyshire and North Wales. The sample comprised a full range of ability levels including: club professionals (n =23); amateur county golfers (n=37); and low/mid/high handicap club golfers (n=113). Participants ranged in age from 17-53

(mean = 35.65, SD = ± 8.86). Participation was entirely voluntary and no rewards were offered for participation.

Instrumentation

The Task and Ego Orientation in Sport Questionnaire (TEOSQ) TEOSQ (Duda & Nicholls, 1992), was developed to assess individuals' proneness for task and ego involvement in the athletic context. TEOSQ is a modified, sport specific version of the inventory developed by Nicholls and his colleagues to assess task and ego orientation in the academic context (Nicholls, 1989). The adapted TEOSQ asked subjects to respond to the statement, "I feel most successful in golf when...", and to indicate their degree of agreement with 13 items reflecting a task and ego orientation to subjective success. The Items are, at times reworded to reflect the specific sport in which the subjects are involved. Calculating a mean for each of the two sub-scales scores the TEOSQ. Duda (1992), reported that the orthogonal task and ego orientation sub-scales have been found to have satisfactory internal consistency (alpha coefficients ranging from 0.81-0.86 and 0.79-0.90, respectively), and the sub-scales have modest test-retest reliability following a three-week period (r = 0.68 and 0.75, respectively) (Duda & Whitehead, 1998).

Performance Competition performance was calculated by subtracting the individual's recognised stroke allowance (handicap) from their total gross score for eighteen holes of medal play. The net score (above or below par) reflected competition performance whilst making adjustments to account for ability differences. None of the scores were posted during the competition, and prizes were awarded within each ability category.

Procedure

Participants were required to respond to the Task and Ego Orientation in Sport Questionnaire (Duda & Nicholls, 1992) one-day prior to a major competition. For the high ability golfers (professionals and county amateur players) the competition was a prestigious regional 'open' competition, and for the lower ability players it was a prestigious club competition. The participants completed the questionnaire in the privacy of their own home, without any assistance. Upon completion of the competition, the participants' competition scores were also recorded.

Internal Reliability Exploratory factor analysis (varimax rotation) confirmed the two-factor structure of TEOSQ. Alpha coefficients for the task and ego orientation sub-scales of .82 and .79, respectively, reflect acceptable internal reliability, and compare favourably with the results cited in Duda and Whitehead's (1998) review (see appendix 7 for reliability data).

Orthogonality A simple bivariate correlation was used to assess the orthogonality of the task and ego orientation sub-scales of TEOSQ. Results revealed a low (r= .07), non-significant correlation, confirming the orthogonality (independence) of the sub-scales. These results imply that it is possible to possess a meaningful goal orientation profile comprising of simultaneously low and/or high levels of task and ego orientation.

Results

As mentioned previously there are a number of statistical procedures that could by applied to the data in order to test hypotheses regarding the interactive effects of task and ego goal orientations. Probably the most sophisticated, moderated hierarchical regression analysis allows the researcher to test separate and combined

effects of the independent variables by creating a new variable that encompasses the interactive effect (Jaccard et al., 1990). An interactive effect is present when the addition of the interactive term to the regression model accounts for a significant proportion of the variance in the dependent variable (p value associated with R^2 change <.05). The results of this procedure applied to the current data failed to elicit significant changes in the proportion of the variance accounted for by inclusion of the interactive term (see Tables 7 & 8).

One of the assumptions of such a procedure is that interactions are continuous in nature. However, the lack of expected significant results might lead one to speculate that a threshold of one or both independent variables needs to be considered when considering performance effects. The potential for a lack of continuity in performance effects (similar to those suggested in catastrophe models, see Hardy, 1996) undermines the use of moderated hierarchical regression, and hence provides a rationale for adopting an alternative approach

Table 7 Moderated hierarchical regression (interactive term added at step 3)

Model	R	R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.186	.035	3.7807	.035	6.157	1	171	.014
2	.335	.112	3.6362	.078	14.857	1	170	.000
3	.343	.117	3.6365	**.005**	**.973**	**1**	**169**	**.325**

a Predictors: (Constant), EGO
b Predictors: (Constant), EGO, TASK
c Predictors: (Constant), EGO, TASK, TASK X EGO

Table 8 Moderated hierarchical regression (interactive term added at step 1)

Model	R	R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.109	.012	3.8254	**.012**	**2.042**	**1**	**171**	**.155**
2	.217	.047	3.7673	.035	6.307	1	170	.013
3	.343	.117	3.6365	.070	13.454	1	169	.000

a Predictors: (Constant), TASK X EGO
b Predictors: (Constant), TASK X EGO, EGO
c Predictors: (Constant), TASK X EGO, EGO, TASK

Two-factor (high/low task X high/low ego) quadrant analysis (of variance) was subsequently utilised to determine if combinations of task and ego orientation levels (as indicated by TEOSQ responses) influenced competition performance. Participants were grouped according to a mean split on each dimension. This resulted in classification into one of four goal orientation profiles; group 1, high ego/high task (n=35); group 2, high ego/low task (n=54); group 3, low ego/high task (n=55); and group 4, low ego/low task (n=29). Ability and task and ego orientation levels are reported in Table 9.

Table 9 Mean goal orientation and ability levels for each goal profile group

Group	N	Task	Ego	Handicap
1. Hi-E/Hi-T	35	4.11[a]	4.34[b]	4.09[a]
		(.33)	(.29)	(5.77)
2. Hi-E/Lo-T	54	2.66	4.22[b]	13.22
		(.48)	(.28)	(7.26)
3. Lo-E/Hi-T	55	3.86[a]	3.15	7.16[a]
		(.44)	(.67)	(9.34)
4. Lo-E/Lo-T	29	2.82	2.58	12.00
		(.48)	(.88)	(5.93)

[a] Significantly different from Groups 2&4; $p<.001$
[b] Significantly different from Groups 3&4; $p<.001$

Participants' competition performance (number of strokes above or below par when stroke allowance had been taken into consideration) was the dependent variable. The data analysis revealed a significant interaction, $F(1,172) = 4.52$, p. $<.05$, suggesting that the interactive effects of pre-competition levels of task and ego orientation might influence competitive performance in golf competition (see Table 10).

Table 10 Competition scores (adjusted for skill level) for each profile group

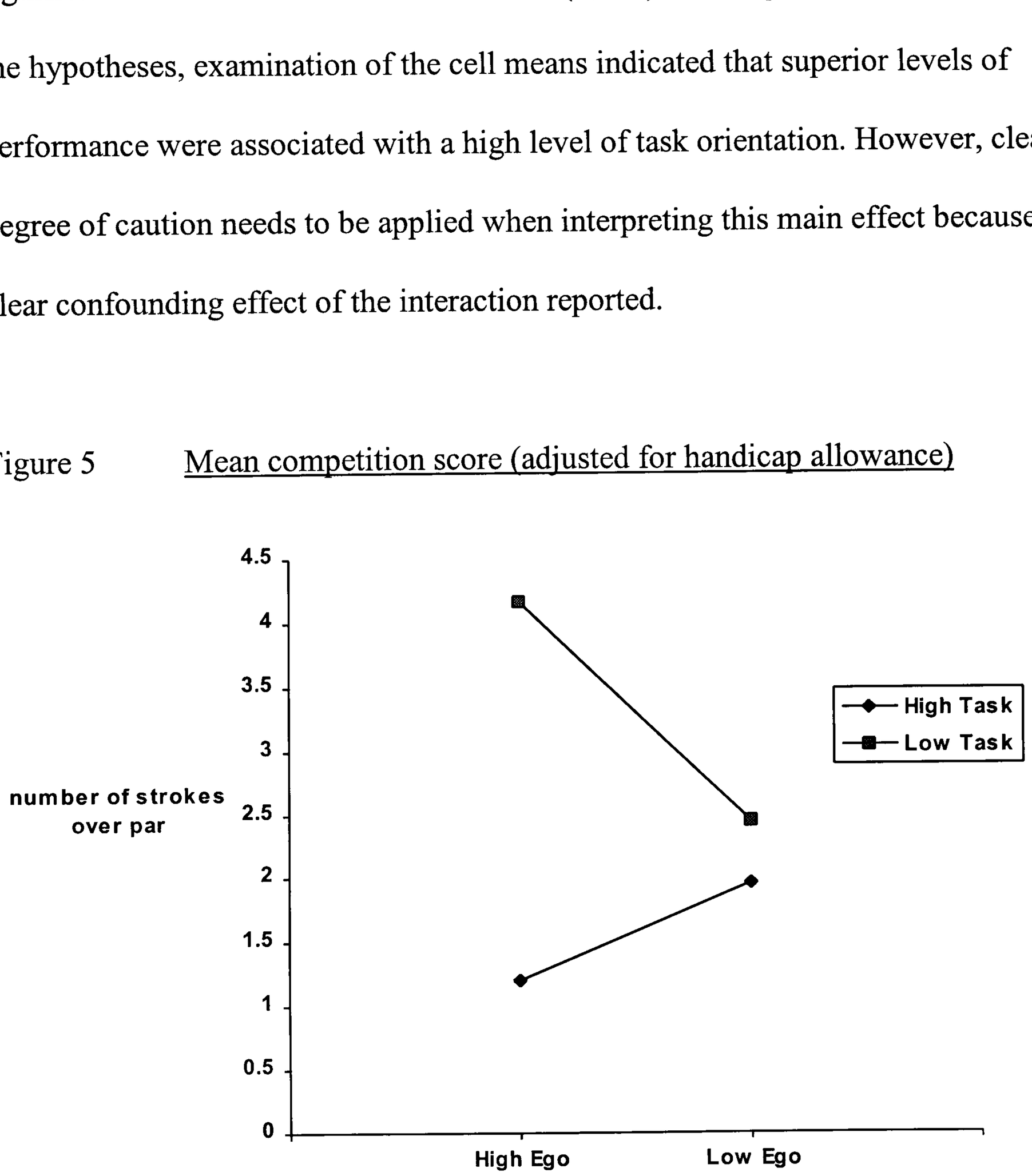
Group	N	Comp. score
1. Hi-E/Hi-T	35	1.20[a]
		(2.81)
2. Hi-E/Lo-T	54	4.17
		(3.68)
3. Lo-E/Hi-T	55	1.96[a]
		(2.98)
4. Lo-E/Lo-T	29	2.45
		(5.48)

[a] Significantly different from Group 2; $p<.05$

NB. Mean scores witihin Table 10 represent the number of strokes over par (net scores). These scores can be positive or negative, consequently standard deviations may appear inflated relative to the mean scores.

Tukey's Honestly Significant Difference (HSD) follow-up tests indicated that group 2 (high ego/low task) performed at a significantly lower level than group 1 (high ego/high task) and group 3 (low ego/high task) (see Figure 5). There was also a significant main effect for task orientation $F(1,172) = 8.74$, $p < .01$. In accordance with the hypotheses, examination of the cell means indicated that superior levels of performance were associated with a high level of task orientation. However, clearly a degree of caution needs to be applied when interpreting this main effect because of the clear confounding effect of the interaction reported.

Figure 5 Mean competition score (adjusted for handicap allowance)



Discussion

The principle issues addressed in the current study were; a) do task and ego orientation levels effect competition performance; and b) can performance be more effectively explained by considering the interaction of high and low task and ego orientation levels? One of the principle differences between this study and many of those in this area relates to the analyses applied. In contrast to the commonly used multivariate procedures, the quadrant analysis based ANOVA allows for examination of hypotheses about the interactive effects of the goal orientations (Hardy, 1998). The results revealed that the goal orientation profiles approach provides researchers with an opportunity to more effectively monitor the effects of goal orientations upon competition performance. Equally, the study supports the suggestion that; "differences in goal perspectives predict variations in performance" (Duda & White 1992, p. 339).

In congruence with the tentative hypothesis regarding the interaction of task and ego orientation levels, performers reporting a combination of a high ego orientation and low task orientation performed significantly worse than those holding profiles involving high levels of task orientation. The implication of these results is that, it may not be appropriate to reduce an individual's level of ego orientation to ensure optimal performance (Roberts et al., 1996). Rather, when performers who are involved in competitive sport have high levels of ego orientation they could be encouraged to maintain a correspondingly high level of task orientation. There was also a significant main effect for task orientation, suggesting that a high rather than low level of task orientation is desirable. However, this result is confounded by the significant interaction. It could be argued, therefore, that the combination of high ego/low task has the most damaging effect upon performance because there are

insufficient levels of task orientation to moderate the social comparison focus that highly ego oriented individuals hold.

Although the dependent variables are different, these results support the conclusions of Roberts et al. (1996) in endorsing an elevation in task orientation rather than a depression of ego orientation. Roberts et al. further suggested that those holding a high ego/low task profile are most likely to exhibit motivationally inappropriate beliefs and cognitions. However, the results fail to support the findings of Fox et al. (1994), and Walling and Duda (1995), that a low task/low ego profile should be associated with poor performance. This apparent contradiction is interesting because it suggests that the context in which the measurement tool is used is important. For example, those dynamic processes which occur within a competition environment (even at a non-elite level) are clearly very different from those that exist in situations more traditionally associated with the study of goal perspectives in sport, for example, children studied in the context of physical education classes.

With regard to the mechanisms underlying the negative impact of a high ego/low task profile, an examination of the goal perspectives and stress and performance literature provides some scope for postulation. Competitive anxiety, withdrawal of effort, reduction in concentration, and unrealistic aspirations have all reportedly been associated with high levels of ego orientation especially when combined with low perceived ability (e.g. Duda, 1992; 1993). Furthermore, given that there is some support for the notion that a high level of task orientation can moderate the effects of a high level of ego orientation (see Roberts et al. 1996), it is logical to suggest that individuals with low levels of task orientation (and a high level of ego orientation) would remain susceptible to these potentially debilitating high ego

effects. Contrary to the predictions of goal perspectives theory, and in support of recent studies (e.g., Fox et al., 1994; Roberts et al., 1996), the results here provide no evidence to suggest that a high ego orientation per se is damaging for performance. Indeed, those performers that hold a profile comprising of a high level of ego orientation and a high level of task orientation performed best. One finding from the present study that does appear at odds with recent studies into goal orientation profiles is the lack of performance differences between those with a low task/low ego orientation profile, and those with a high task/low ego profile. Both Fox et al., (1994) and Walling and Duda (1995) have stated explicitly that those with simultaneously low levels of task and ego orientations hold maladaptive beliefs and cognitions with relation to physical education. One possible explanation for the lack of decrements in performance for the low/low profile may be due to a relative indifference towards the task, and hence a lack of concern regarding goals associated with it.

Predicting the state goals that individuals prefer on the basis of their goal orientation profiles (not withstanding the moderating impact of the situation) may help to explain some of the research findings with regards to performance. By considering the definitions of task and ego orientations, it could be argued that a highly ego-oriented individual (irrespective of their level of task orientation), would set normatively referenced (outcome) goals, and that a high task orientation implies a self-referenced (performance or process) focus for state goals. Consequently, these results parallel findings within the goal-setting/performance literature that performance and, in particular, process goals are important during competition (see Burton, 1989; Kingston & Hardy, 1994; 1997; Weinberg, 1988). Furthermore, they provide some support for the contention that outcome goals are not necessarily

inappropriate (Hardy et al., 1996a; Kingston & Hardy, 1994), since those individuals possessing a high level of ego orientation would (by definition) be expected to set some goals based on social comparison (especially when the motivational climate is ego-involving).

The finding that the high task/high ego group experienced relatively high levels of performance suggests that for such individuals, the potentially 'ego-involving' nature of even 'major' golf competitions may be insufficiently powerful to override a resilient task orientation. Equally, it supports the contentions of various researchers that a high level of ego orientation is not necessarily detrimental to performance (e.g., Brunel & Avanzini, 1997; Hardy et al., 1996a). Similarly, it may be that in a competitive situation those holding a high task/high ego profile might consciously focus their attention on task performance. Avoidance of concern about social evaluation issues may be perceived as being the most effective strategy for optimising their chances of winning (Kingston & Hardy, 1994).

In addition to competition performance (adjusted for ability) being influenced by goal orientation profiles, it is interesting to note that the two groups who performed best also had the lower handicaps prior to the competition. This might suggest that adaptive goal orientations may be a consequence of higher levels of ability. Clearly this brings into question the issue of causality, since it is quite possible that adaptive profiles (i.e. those that elevate the meaningfulness of the process irrespective of the level of ego orientation) are merely a consequence of a greater ability and understanding of how to realise ones performance objectives. Moreover, the results may simply be confounded by the fact that higher ability golfers perform relatively better in competition.

It could be argued that an achievement setting such as a golf competition, where evaluation is public (after the event) is more likely to emphasise an ego rather than a task type of involvement. However, there is no obvious reason why the strongly ego involving nature of the situation should compromise the state of involvement predicted for an individual with a high level of task orientation. Indeed, the benefit of using a golf competition in which to measure/assess performance is that the motivational climate can be both competitive and mastery involved. While winning undoubtedly exists as a potential criterion for success, the scoring system in golf enables each individual to self-monitor their performance relative to a self-referenced norm, should they prefer that as their primary criteria for success. Furthermore, the nature of the game allows individuals to consistently monitor and regulate their performance through the availability of objective feedback, and thus gain information in relation to the acquisition, learning and mastery of skills.

A number of applied researchers have implied that, for elite performers a high ego and high task orientation combination may be desirable (e.g., Hardy, et al., 1996a). Researchers need to clarify this position, and examine the possible moderating effects of ability/experience/skill level upon the goal orientations/cognitions/affect relationships. Sample variance may also confound experimental findings in this area, since performance variability is accepted to increase as a function of diminishing levels of ability. An interesting question remains; is it possible to classify individual ability levels according to the patterning of goal orientation profiles?

It is important to acknowledge that there may be a number of measurement issues that need to be addressed to enable this line of research to progress smoothly.

An important focus for future research should be the development of valid and reliable measures of goal states in sport settings. Achieving this objective will enable researchers to examine the effect of situational cues on the goals that performers focus upon. Certainly the current study would have benefited from a measurement of state goal perspective, as well as information on the perception of the motivational climate and the perceived importance of the situational cues. Undoubtedly, these would strengthen inferences made from the dispositions to the state of involvement.

In conclusion, there is some evidence from the few studies that have examined goal orientation profiles to suggest that practitioners should emphasise the importance of creating an environment which promotes a high level of task involvement and also, where an ego type of involvement is supported rather than discouraged. Given the nature of sport competition, especially at an elite level, this view is certainly more palatable across the ability spectrum than a call for the wholesale derogation of an ego involvement.

Chapter 7

Can goal-orientation profiles predict high versus low ability in golfers?

Abstract

Although in the past a high level of ego orientation has been deplored (e.g., Duda, 1992, 1993), it is now proposed that a high level of ego orientation when combined with a simultaneously high level of task orientation is adaptive as it allows athletes more than one possible criterion for success. Assuming an adaptive profile exists among higher level performers, it should be possible to discriminate between ability levels on the basis of their goal orientation profiles. The Task and Ego Orientation in Sport Questionnaire (Duda & Nicholls, 1992) was administered to seventy-nine golfers categorised as high (n=30) or low ability (n=49) on three separate occasions (one-day prior to practice, one day prior to a major competition, and during the closed season when not playing on a regular basis). Discriminant function analyses were used to determine the extent to which composite levels of task and ego orientations could be used to distinguish between the two ability levels. The results suggest that goal profiles could distinguish between high and low ability, and further suggested that the patterning of profiles are not situationally consistent. Specifically, the prospect of competition led the lower ability group to modify their criteria for success and hence their preferred state of involvement. The implication is that skill level should be considered when endorsing particular goal-setting practices across different naturally occurring situations.

Introduction

The scope of studies into individual differences and their effect on motivated behaviour, has increased considerably over the past 10 years. These developments have paralleled the changing emphasis within applied sport psychology from a predominantly cognitive based approach to behaviour modification, to a more balanced approach which gives similar consideration to motivational and emotional variables.

Goal perspectives theory (Dweck & Leggett, 1988; Nicholls, 1989; 1992) originated as a social cognitive approach to understanding motivation in achievement settings. According to the theory, there are two major goal perspectives operating in achievement-related contexts: individuals determine subjective success by adopting normative (ego-involved) or self-referenced (task-involved) criteria (Nicholls, 1989). Furthermore, the dispositional goal orientations that individuals hold are argued to reflect a proneness to employ either ego or task-involving criteria in achievement settings.

The existence and measurement of these two goal perspectives in sport has been confirmed using a number of assessment tools. One of the more widely used is the Task and Ego Orientation in Sport Questionnaire (TEOSQ) (Duda & Nicholls, 1992), which assesses an individual's proneness to be task or ego involved. The two-factor structure of the TEOSQ has been found to be stable, with two internally consistent orthogonal (independent) factors. The independence of these factors has been supported in studies of both elite and non-elite sport participants (Duda & White, 1992). An alternative tool which is being used with increasing regularity to assess goal perspectives is Roberts and Balague's (1991) Perceptions of Success

Questionnaire (POSQ) (c.f. Roberts, Treasure & Balague, 1998). To date there is no empirical data supporting the relative efficacy of one measure over the other (see Duda & Whitehead, 1998).

The research into goal orientations in sport and exercise settings has been reviewed extensively (see, for example Duda, 1992; Duda & Whitehead, 1998; Roberts 1992). One of the most robust findings within this body of research is that a high level of ego orientation combined with a low perception of ability has negative implications for performance and affect. Similarly, a high as opposed to a low level of task orientation is associated with adaptive beliefs and cognition's (Duda, 1992;1993; Hardy, Jones & Gould, 1996a).

Nicholls' original conceptualisations of task and ego goal perspectives (1989;1992) clearly implies that the two goal orientations are independent. Nevertheless, with the exception of a few (generally more recent) studies (e.g., Fox, Goudas, Biddle, Duda & Armstrong, 1994; Roberts, Treasure & Kavussanu, 1996; Walling & Duda, 1995), a criticism that might be levelled at much of the goal perspectives literature (when applied to sport) is that researchers often allude to comparisons between individuals high in task orientation with individuals high in ego orientation (see Duda & White, 1992; Newton & Duda, 1995; White & Zellner, 1996). It could perhaps be argued that this oversight can be attributed to either semantics, or the tendency of researchers to emphasise the most pertinent and significant findings, either way it is at best misleading. Clearly the orthogonality of the goal orientations (measured using TEOSQ) renders such comparisons meaningless, since it is quite possible for an individual to possess simultaneously high or low levels of task and ego orientations. Furthermore, making comparisons of

individuals who are ostensibly high in task orientation with subjects high in ego orientation ignores the potentially important interactive effects of the second independent variable (Hardy, 1997). Traditional multivariate procedures that have been used to assess dispositional goal perspectives do not allow for the testing of hypotheses regarding the interactive effects of task and ego orientations (Hardy, 1998).

An appreciation of this shortcoming has stimulated researchers to seek alternative approaches to studying goal perspectives. One of the alternative paradigms has utilised the notion of goal orientation profiles. In their simplest forms, these profiles make use of the independent nature of task and ego orientations (measured using TEOSQ) to categorise an individual into one of four goal orientation sub-sets (high task, high ego; high task, low ego; low task, high ego; and low task, low ego). The principle advantage with this approach is that it enables researchers to test hypotheses regarding the interactive effects of task and ego orientations using simple two-factor designs. An obvious disadvantage however, is that dichotomising a continuous variable undermines the sensitivity of the chosen measurement tool. This argument is somewhat negated, however, by Schutz & Gasseroli's (1993) argument that all questionnaire data is essentially ordinal, and hence non-continuous. The weakness of using a median or mean split techniques to categorise subjects is further exacerbated (in this instance) by the negative skewness associated with the task orientation sub-scale of the TEOSQ (see Duda & Whitehead, 1998).

There are undoubtedly shortcomings with the use of quadrants to describe goal orientation profiles, most notably from a methodological perspective (see Jaccard, Turrisi & Wan, 1990). For example, dichotomising (into high and low categories)

factors assessed using a 5-point Likert-like scale undermines the sensitivity of the measurement tool. Nevertheless, work using this paradigm has led to an increased appreciation of the need to consider the combined patterning of task and ego orientations (see Hardy, 1997). As Fox et al., (1994) suggest, "…their impact in combination may be somewhat different from their effect examined separately". (p. 255)

It has become widely accepted that the type of involvement that an individual prefers in achievement settings is a product of a dispositional by situation interaction (e.g., Duda & White, 1992). According to Dweck and Leggett (1988), situational factors influence individual tendencies to adopt a state of involvement which reflects the dispositional orientation they hold. Burton's (1992) competitive goal setting also model supports this notion of a disposition by situation interaction, and makes a number of predictions with regard to; goal setting practices, performance, and associated attributions.

Researchers have questioned the construct validity (Hardy, 1997), and the appropriateness of TEOSQ to measure dispositional perspectives (Kingston & Hardy, 1997; Kingston & Swain, 1998). One concern is the fluctuating nature of the so-called dispositional orientations, and their tendency to alter according to the salience of the various achievement related cognition's. Indeed, preliminary empirical data suggests that athletes' conceptualisations of ability (dispositional goal orientations measured using TEOSQ) change in a systematic fashion according to perceived situational factors (Kingston & Swain, 1998; Hardy, 1997). It has been suggested that a principal criticism of TEOSQ relates to the fact that item pools have been developed via behavioural correlates from academic settings rather than the definitions of task and

ego orientations, and hence do not necessarily measure the actual goal orientation (Harwood, Hardy & Swain, in press).

There is nothing revolutionary in suggesting that the situation or context impacts upon an individual's goal perspective. What is being questioned is whether TEOSQ is measuring the dispositional goal orientations that we hold, or merely the more transient preferred state of involvement. Reference to moderate to high test-retest reliability does not necessarily overcome these arguments, especially if the measurement tool was administered within a similar context. If TEOSQ is measuring a truly dispositional construct, then responses should be minimally influenced by situational or contextual variations. Swain & Harwood (1996), found no relationship between the TEOSQ scales and preferred state goals, and alluded to these concerns when suggesting that in order for TEOSQ to be more predictive it may need to be administered within a given context/situation. Indeed, it can be argued that the power of dispositional variables lies in their predictive ability in a variety of situations rather than their prediction that similar patterns of behaviour will be displayed across these situations (see Dweck & Leggett 1988).

Studies that have utilised a profiles approach to examining goal perspectives have generally focused on their relationships with aspects of motivation and beliefs about success (Fox et al., 1994; Roberts et al., 1996; Walling & Duda, 1995; White, 1998). While researchers have often made inferences about the relationship of goal orientation profiles and task performance, there is little direct evidence from published articles to support this contention. Researchers have discussed the possibility that the profiles of highly skilled performers are distinguishable from those of there less able counterparts (e.g. Brunel & Avanzini, 1997; Hardy et al.,1996a). The rationale for this

contention is logical, and while no comparison groups were used, Fox, Goudas, Biddle, Duda and Armstrong (1994) identified that higher level performers possessed a combination of high ego and high task orientations simultaneously. Following interviews with elite performers a number of applied researchers have supported this contention (see Jones & Hardy, 1990; Orlick & Partington, 1988; Hardy et al., 1996a). To summarise, it may be possible to discriminate between ability levels on the basis of the patterning of task and ego goal orientations, and while causality cannot be reliably inferred, this association may have implications for the types of goals and strategies that performers use across situations. Furthermore, examination of relative levels of task and ego orientations as function of ability is of interest because of the emphasis that much of the goal orientation literature has placed on the downplaying of an ego orientation.

The purpose of the current study is to determine the extent to which levels of task and ego orientations can be used to differentiate between athlete ability levels, and to establish whether the nature of the discrimination was consistent across a number of situations. Assessing goal orientation profiles across a number of contexts will provide information regarding the situations under which goal orientations can best predict ability. It was hypothesised that goal orientation profiles could indeed distinguish between ability levels, and further that higher ability performers would generally possess higher levels of task and ego orientation. However, the nature of the relationship between goal orientations and ability might be mediated by prevailing situational factors.

Method

Participants

A total of 79 male golfers from British golf clubs in Cheshire, Derbyshire and North Wales participated in this study. The sample consisted of two ability groups (see note). The high ability group (n=30 in total) consisted of club professionals (n=13) and county representative golfers (n=17) with handicaps ranging from +2 to -2 (mean handicap 0.95, SD = ± 0.44). The low ability group consisted of club golfers (n=49), with handicaps ranging from 6-28 (mean handicap =17.60 SD = ± 8.21). Participation was voluntary, and participants were required to complete a single thirteen-item questionnaire on three occasions throughout the year.

N.B. This pool of participants are those previously discussed in chapter 5, however, the professional and county golfers reported in that study have been collapsed to produce a high ability group, and the remaininder collapsed to form a low-ability group.

Instrumentation

The Task and Ego Orientation in Sport Questionnaire (TEOSQ) TEOSQ (Duda & Nicholls, 1992), was developed to assess individuals' proneness for task and ego involvement in the athletic context. TEOSQ is a modified, sport specific version of the inventory developed by Nicholls and his colleagues to assess task and ego orientation in the academic context (Nicholls, 1989). TEOSQ asks subjects to respond to the statement, "I feel most successful in golf when...", and to indicate their degree of agreement with 13 items reflecting a task and ego orientation to subjective success, with the scale anchored from 1 (strongly disagree) to 5 (strongly agree). Items are, at times reworded to reflect the specific sport in which the subjects are involved. The TEOSQ is scored by calculating a mean for each of the two sub-scales.

Duda (1992), reported that the orthogonal task and ego orientation sub-scales have been found to have satisfactory internal consistency (alpha coefficients ranging from 0.81-0.86 and 0.79-0.90, respectively). Furthermore, the sub-scales have moderate test-retest reliability following a three-week period (r = 0.68 and 0.75, respectively) (see Duda & Whitehead, 1998).

Procedure

Participants were required to respond to the Task and Ego Orientation in Sport Questionnaire (Duda & Nicholls, 1992) on three separate occasions. The first occasion was in the middle of the closed season for golf (pre-season) when subjects were neither practising nor competing on a regular basis. In the UK, this period usually coincides with poor weather and course conditions, and occurred in late January. The second occasion was the day prior to beginning practice for a major competition (pre-practice), this was typically 5-6 days prior to a relatively (depending on the ability of the subjects) high-status competition. Finally, subjects were asked to complete the questionnaire one-day prior to a major competition, but not the competition for which they had been preparing at the previous data collection (pre-competition). At each occasion, participants completed the questionnaire in the privacy of their own home, without any assistance, i.e. out of the sporting environment. This was to control, as far as possible for the direct effects of the situation on the responses to the questionnaire items.

Results

Discriminant function analysis was used to discriminate between groups (in this case high versus low ability golfers) on the basis of patterning of the dependent

variables (in this case task and ego orientations). In addition to identifying the ability of the variables to distinguish between the groups, the analysis also indicated the extent to which each of the dependent variables contributes to this discrimination (i.e. do levels of task or ego orientation, or both predict group membership). The discriminant function is a composite variable of the weighted sums of the dependent variables (task and ego scores). The analysis partials out the effects/correlation's between the dependent variables in an attempt to maximise their predictive power.

Wilks' Lambda, tests the degree to which the dependent variables (predictor variables) can differentiate between the criterion groups (i.e. do the groups differ on the combined predictor variables?).

Pre-season

At pre-season, composite levels of task and ego orientation could be utilised to significantly differentiate between the groups (Wilks' Lambda = .71, p <.001). The associated standardised structure coefficients indicated that both task and ego orientation levels contributed to the prediction of group membership (r's=.81 and .66 respectively) (see Table 11). Analysis of the group means showed that the high ability group had significantly (p <.001) higher levels of both task and ego orientation than the low ability group (see Table 12). The high association between the groups and the predictor variables resulted in 81% of cases being appropriately classified. Specifically, 83.3% of the high-ability group, and 79.6% of the low-ability group were correctly classified on the basis of their composite task and ego orientation levels.

Table 11 Standardised structure coefficients from Discriminant Function Analysis (indicating discriminatory power) of Task and Ego Orientations Measured at Pre-season, Pre-practice and Pre-competition.

	Pre-season	Pre-practice	Pre-competition
Ego Orientation	0.66	0.83	0.20
Task Orientation	0.81	0.70	0.83

N.B. Standardised structure coefficients represent the pooled within-groups correlationss between discriminating variables and the discrminant function. Values above .30 are regarded as representing significant contributors to the function.

Pre-practice

At pre-practice, a significant discriminant function emerged, when performed on the pre-practice levels of task and ego orientation (Wilks' Lambda = .70, p. <.001). This again indicated that composite scores of the predictive variables successfully differentiated between groups. The associated standardised structure coefficients (see Table 11) again indicated that both task and ego oreintation contributed to the discrimination (r's=0.83, and 0.70 respectively). Similar to the results for pre-season, examination of the group means indicated that the high ability group had significantly (p. <.001) higher levels of task and ego orientation than the low ability group (see Table 12). Overall, composite scores could again classify appropriately 81.0% of the cases (76.7% of the high-ability group, and 83.7% of the low-ability group).

Table 12 Group Means and Standard Deviations for Task and Ego Orientations Measured at Pre-season, Pre-practice and Pre-competition.

	Pre-season		Pre-practice		Pre-competition	
	Task	Ego	Task	Ego	Task	Ego
High Ability	3.95[a] (.40)	3.67[a] (.85)	3.85[a] (.34)	3.58[a] (.57)	3.78[a] (.43)	3.94 (.51)
Low Ability	3.48 (.47)	3.03 (.69)	3.45 (.47)	2.88 (.65)	3.13 (.70)	3.81 (.55)

[a] Significantly different from Low Ability Group ($p<.001$)

Pre-competition

At pre-competition, a significant discriminant function again emerged (Wilks' Lambda = 0.72, p. <.001), this indicating that task and ego orientation scores could be used to differentiate between the groups. However, examination of the standardised structure coefficients (see Table 11) indicated that only the task orientation scores contributed to the prediction (for task orientation r =.83, and for ego orientation r =.20). Analysis of the group means indicated that while the high ability group had significantly (p <.001) higher levels of task orientation than the low ability group, there were no significant differences between the levels of ego orientation (see Table 12). Overall, 81.0% of cases were correctly classified on the basis of their pre-competition task and ego orientation levels (76.7% of the high-ability group, and 83.7% of the low-ability group).

Discussion

The current study sought to establish whether goal orientation profiles (as measured using TEOSQ) could be used to discriminate between golfers of high and

low ability (as indicated by golf handicap). Furthermore, it sought to determine if this predictive quality was consistent across a variety of situations. The questions addressed in this study are important for a number of reasons. Firstly, there have been no studies to date providing empirical data on the association between achievement goal orientations and skill level. Secondly, if one assumes that high ability golfers have a more adaptive (or perhaps protective?) profile (as a function of their higher ability), then a useful objective for less able golfers would be to develop similar goal orientation profiles. Such profiles might help them because of the possible association between goal orientation profiles and the state goals that performers are predicted to set. Thirdly, if TEOSQ is used as a diagnostic tool, coaches and practitioners need to further understand the relationship between preferences towards particular goals (goal orientations) and situational factors.

Consistent with previous research, psychometric analyses of the raw data supported the orthogonality of the task and ego orientation dimensions of TEOSQ. The results from the discriminant function analysis suggest that composite levels of task and ego orientation can be used to predict high versus low ability in golfers across a variety of situations. They also indicate that the patterning of goal orientation profiles which predict ability is not situationally consistent. Specifically, high levels of task and ego orientation predicted high ability better during pre-season and prior to practice, while task orientation alone predicted ability prior to competition. It is also worth noting that pre-season and prior to practice, task and ego orientation levels for the high ability group were significantly ($p<0.001$) greater than for the low ability group. Goal orientation measures taken prior to competition, however, suggest that, while the task orientation levels of high ability golfers are significantly higher, pre-

competition levels of ego orientation are similar for high and low ability golfers. This suggests that competition may cause lower ability performers to modify their criteria for success (preferred state of involvement) towards an increased focus on social comparison.

These results lend further credence to the contention that the goal orientation profiles of skilled performers are distinguishable from their less able counterparts (Brunel & Avanzini, 1997; Hardy et. al., 1996a). Specifically for this study, task orientation (high levels) predicted high versus low ability at pre-season, prior to practice and prior to competition. However, it was somewhat unexpected to find that (a high level of) ego orientation predicted ability at pre-season and prior to practice, but not prior to competition.

In terms of the actual make-up of the profiles, the results suggest that a high level of ego orientation when combined with a high level of task orientation may have beneficial effects for performance. Furthermore, although causality is impossible to establish, this supports the notion that an adaptive goal orientation might consist of relatively high levels of both task and ego orientation (Fox et. al., 1994; Hardy et. al., 1996a; Roberts et. al., 1996). The ego orientation levels of low ability performers prior to competition are elevated relative to the other situations (i.e. they are no longer significantly below those of the high ability performers). This might suggest that such performers have insufficiently high levels of task orientation to overcome the tendency to engage in increased social comparison processes when faced with the prospect of competition (Kingston & Swain, 1998). Furthermore, these results provide further evidence for the instability of dispositional goal orientations as measured using TEOSQ even when administered in consistent 'neutral' settings (see Hardy, 1998).

It is of practical significance to acknowledge that while profiles may differ as a function of ability, these differences are not consistent. Consequently, it may not be appropriate to take a 'carte-blanche' approach to the modification of achievement-related cognitions. It is clear, however, that high levels of task and ego orientation characterise high ability performers, and that both task and ego orientations can (more or less) effectively predict high levels of ability depending on the specific situational factors that exist. The capability of task and ego orientation levels to significantly distinguish between high and lower ability groups appears consistent (standardised structure coefficients 0.66 -0.83 for ego orientation, and 0.70 - 0.83 for task orientation) except prior to competition. With regard to the issue of stability, it may be that performers' preference for different types of involvement (goal orientation profiles) alter with an increased understanding of the strategies required to perform optimally. For example, the relative increase in ego orientation levels for the lower ability group prior to competition may be inappropriate without an associated increase (or prioritisation) of task orientation. Alternatively, as skill level increases (as a function of extensive practice) athletes may more effectively modify or prioritise their criteria for success (i.e. the types of goals that they set). This can help to ensure that, for example, practice remains stimulating, and performers maximise their opportunity to achieve success (by self-referenced and/or other referenced criteria) in the competition environment.

It has been suggested that one of the limiting factors of research into goal orientation profiles using TEOSQ relates to the actual measurement tool. The make-up of the item stem (particularly the task orientation sub-scale) has been criticised for being based on the correlates rather than the definitions of task and ego orientation

(see Hardy, 1997; 1998). A second major criticism that can be levelled at the TEOSQ relates to the orthogonality of its dimensions, and more specifically, the lack of orthogonality of the states of involvement which are purported to underlie the dispositional goal orientations (see, Hardy 1998, Harwood, Hardy & Swain, in press). The discussion regarding goal orientation profiles earlier in this paper reflects the importance of the independent nature of the task and ego orientation dimensions.

In terms of methodological limitations, the current study could be criticised for the broadness of the high and low ability categories. Within the lower ability group, the difference in skill level between an individual possessing a handicap of six, and another possessing a handicap of twenty-eight is markedly different. In terms of distinguishing between the ability groups, while the cut-off has to be somewhat arbitrary, it was felt that that the difference of stroke allowance of four strokes between a six-handicap (equating to a good club player) and a two-handicap (equating to a golfer of representative standard) represented a discernible shift in ability level, and hence served as a natural watershed for the group boundaries. The distinction was further reinforced by a lack of subjects holding handicaps of between three and five, compared to a relatively consistent distribution of ability levels within the two groups. Future studies should perhaps ensure a more distinguishable group identity, and balance this with a need to provide meaningful comparison groups (for example, high, moderate and low ability).

It seems clear that future researchers may need to look for alternative measurement tools examining goal orientations in sporting situations. Of primary importance is the development within a sporting context of a measurement tool which is based on the conceptualisation of goal orientations rather than correlates of the

tendency to judge success or failure using self-referent and/or social comparison criteria (for example, beliefs about success, enjoyment, and effort). Furthermore, the refined measure should take into account the substantial contextual differences that exist between sporting and academic environments. The 12-item Perception of Success Questionnaire (Roberts & Balague, 1991, c.f. Roberts et al., 1998) appears promising as a suitable alternative. It is a sport specific inventory reported to have strong psychometric properties with robustness to measure task and ego orientations in sport across a variety of samples (Ommundsen & Roberts, 1996; Roberts et al., 1998). Associated with any refinements to the measurement tool is the clarification of the relationship between dispositional goal orientations and the states of involvement that individuals hold. The limited research which has examined this relationship has found no relationship between the TEOSQ sub-scales and states of task and ego involvement (Swain & Harwood, 1996; Harwood & Swain, 1998). Consequently, it may be necessary to develop distinct measures of goal orientations and states of involvement, and then cross reference these in order to obtain a degree of predictive validity (with situational factors controlled for). A development of this nature will enable the relationship between goal orientation profiles and the discrete goals that performers set to be more meaningfully examined. With a more effective measure of dispositional goal orientations researchers should be encouraged to further examine the changes in dispositional goal orientations (and the possible tendency to favour specific types of state goals in specific situations) as a function of ability. Determining the association between goal orientation profiles and ability will enable practitioners to more effectively tailor mental training programmes to the specific needs of the individual across a variety of naturally occurring situations.

Chapter 8

General discussion

Introduction

This final chapter attempts to tie together the empirical findings from each of the individual research papers with the current empirical base. Firstly, it briefly describes the aims of the research and summarises the results from each of the individual studies. Secondly, it attempts to address the theoretical issues that have arisen from the two domains: 1) goal-setting as a psychological skill (addressed in chapters three and four); and 2) goal perspectives as an individual difference factor (addressed in chapters five, six and seven). In most cases, salient discussion points have already been addressed within the confines of the individual research studies. However, where the scope of the discussion sections in the individual chapters has not permitted an adequate level of elaboration, the issues will be readdressed in this section. The third section will discusses the practical implications of the findings from the empirical studies, and the fourth the strengths and limitations of the thesis before finally, suggestions are made for future research.

Brief summary of results/main findings

This brief summary will look at the results of five studies which have constituted the empirical portion of this thesis, and incorporate an evaluation of the extent to which these studies have addressed the central issues highlighted in the critique earlier (chapter 2).

The general aim of this research project was to examine the effects of goals and goal-setting upon performance. Furthermore, it sought to identify the efficacy of setting certain types of goals, and the implications of holding certain beliefs regarding the criteria by which personal competencies are judged. Early research into goal-setting in sport found support for the view that self-referenced performance goals were more appropriate in certain competition situations than outcome goals. The principal underpinning to this suggestion was that outcome goals lacked the flexibility of self-referenced performance goals. Beggs (1990), however, suggested that goals are something of a "double-edged sword", and surmised that, because goals were important to the athlete, required action, and were not always attainable, they may in themselves become a source of stress. The study reported in chapter three addressed this issue by arguing for the use of an alternative type of self-referenced goal (process goals). The results from this study suggested that self-referenced goal setting training per se may have benefits for performance. However, over and above this effect, the use of process goals may enable performers to realise more immediate improvements (in competitive performance), and experience positive effects on a number of variables which underpin task performance (self-efficacy, control of cognitive anxiety, and concentration). It is logical to infer that these factors might reasonably serve as the mechanisms through which positive effects for process goals are realised.

Although, the preliminary evidence appears to support the use of process oriented goals, Hardy et al. (1996b) argued that encouraging high level performers to focus on specific single process goals might interfere with the smooth automatic execution of well-learned skills (Baumeister, 1984; Masters, 1992). One way around this apparent paradox is to advocate the use of pre-performance routines which are

cued using a holistic representation of the target behaviour. For skilled performers this holistic approach will reduce the tendency to focus on individual aspects of the technique and hence interfere with automaticity. The second study (chapter 4), therefore sought to establish the value of a pre-performance routine training programme (with a highly skilled athlete) which incorporated holistic process goals. The multiple base-line study provided evidence which suggested that systematic development of such routines reduces the variability in timing of pre-shot activities. Specifically, these effects were found for chip-shots, putting, and to a lesser extent approach play. While these findings were not supported by improvement in self-assessed performance, research in this area (see Crews, 1994) suggests that a reduction in variability of the routines may be a precursor to performance enhancement.

Although there is substantive evidence supporting the existence and use of a variety of different types of goals, viewing goals and the practice of setting goals as only a psychological skill that can be taught is somewhat limiting. Primarily, this perspective overlooks the importance of individual differences in preferences toward setting certain types of goals. Contemporary motivation theorists (e.g., Nicholls, Duda, Dweck and associates) view preferences towards goal types like personality dispositions which relate to how the individual construes their ability. According to these theorists there are two major goal perspectives operating in achievement settings, and these describe the criteria through which the individual judges personal competence. The first perspective (ego orientation) is held when success is based upon comparison of ones own performance to that of others. A second perspective (task

orientation) is held when success is based upon some self-referenced criteria, for example, personal improvement or mastering (all or part of) the task.

The measurement of goal perspectives in sport has been carried out mainly by using Duda and Nicholls' (1992) Task and Ego Orientation in Sport Questionnaire (TEOSQ). While acceptable test-retest reliabilities have been widely reported, TEOSQ has generally been administered in stable, non-competitive settings. Clearly the multi-faceted nature of competitive sport, the motivations of the performers, and the dynamics which exist within sporting situations provide numerous opportunities for athletes to alter their own particular criteria for success and failure (e.g. in practice and competition). The third empirical study (chapter 5) addressed this issue of stability, and attempt to identify if the (so-called dispositional) goal orientations measured using TEOSQ change in a systematic fashion according to different situational factors. The results demonstrated that dispositional goal orientations measured using the TEOSQ are situationally sensitive, i.e. the way in which athletes conceptualise ability changes in a systematic fashion across naturally occurring situations. The results also suggest that skill level has a moderating effect on the stability of the goal orientations.

An important underpinning of goal perspectives theory is that task and ego orientations measured using TEOSQ are orthogonal (independent). This implies that athletes can be simultaneously high or low in both task and ego orientation or high in one and low in the other. It has often been reported by researchers and reviewers into goal perspectives that a high level of ego orientation per se puts one at risk motivationally (e.g., Duda, 1992; 1993). Furthermore, this suggestion has frequently been made without acknowledgement of the associated level of task orientation, a fact

which renders this conclusion (at best) misleading. While there may be a body of evidence from research with children and academics, the opinion that high levels of ego orientation are *always* detrimental to performance in the sporting context does not comfortably with the experiences of coaches and applied practitioners (see, Hardy et al., 1996a). The study reported in chapter six addressed this issue by examining the effects on performance of different combinations of high and low levels of task and ego orientation held prior to the competition. Contrary to one of the central tenets of goal perspectives theory, the results indicate that there is no evidence to suggest that a high level of ego orientation per se has a detrimental effect on performance. More specifically, they show that someone holding a goal orientation profile comprising of a high level of ego orientation and a low level of task orientation results in lower levels of performance compared to those holding a high level of task orientation in conjunction with <u>either</u> a high or low level of ego orientation. The results also support previous suggestions (e.g. Roberts et al., 1996) that high levels of task orientation buffer the potentially debilitating effects associated with a high level of ego orientation.

There is both empirical evidence and anecdotal support to suggest that the possession of simultaneously high levels of task and ego orientation might characterise highly skilled performers (e.g. Brunel & Avanzini, 1996; Gould, Ecklund & Jackson, 1992; Hardy et al., 1996a; Orlick & Partington, 1988). However, the results from the previous study (chapter six) suggest that irrespective of the level of ego orientation, a high level of task orientation is desirable. While dispositional goal orientations measured using TEOSQ are unstable (see chapter three), it is reasonable to infer that because of acquired control strategies, more able performers should be

able to maintain more adaptive profiles across different yet naturally occurring situations.

The final empirical study sought to address this issue by: 1) investigating whether the patterning of task and ego orientations could discriminate between high versus low ability athletes across different situations, and; 2) identifying which criteria for conceptualising ability (task or ego orientation) contribute to the prediction of different skill levels. The results suggested that patterning of task and ego orientations of higher ability performers are distinguishable from those of lower ability golfers. They also indicate that this predictive ability is not situationally consistent. Specifically, both task and ego orientation predicted ability pre-season and prior to practice, but only task orientation levels predicted ability pre-competition. Consistent with recent suggestions from the sport psychology literature, the higher ability performers generally had higher levels of both task and ego orientation when compared with their less able counterparts. Furthermore, these findings support the fluctuating nature of goal orientation profiles according the situational factors.

Theoretical implications

While carrying out the research which makes up this thesis, a number of important discussion issues have arisen. In general, these have been addressed within the individual study chapters. However, a detailed perusal of the chapters points to a number of additional issues that may be important in the development of research and understanding within the respective subject areas, yet have been beyond the scope of the individual chapter discussion areas. The theoretical issues that are discussed will not be done so in any perceived order of importance. They may apply to; a) goal-

setting as a psychological skill (studies reported in chapters three and four); b) goal orientations as an individual difference factor (studies reported in chapters five to seven); or c) conceptual issues that are generalisable to the thesis as a whole.

Process goals and control

It has been suggested previously (see chapter two) that process goals may influence performance by facilitating attention and concentration to the task at hand (Boutcher, 1990; Hardy & Nelson, 1988). Preliminary research has also indicated that process goals may reduce perceptions of physiological arousal (somatic anxiety) and enhance performance in otherwise stressful competitive situations (Kingston, Hardy & Markland, 1992).

It is reasonable to argue that different types of state goals lie on a continuum based on the degree of control which performers can exert over their goals. Athletes can exert only minimal control over goals which are based on social comparison processes (outcome goals). Secondly, performance goals which enable the athlete to determine the specific self-referenced performance standard they wish to realise can be influenced by a number of external factors that might impinge on that goal. For example, weather/playing conditions, judges, bad luck, and poor strategy, all of which may play a role in preventing the athlete from achieving that performance standard (Kingston & Swain, 1998). Process goals which focus on a specific cognitive or behavioural component of the task are almost completely under the control of the performer, and hence lessen the potential for external influence. Finally, when process goals (as described in chapter 4) are holistic, they may be less likely to interfere with automatic control systems. Automated skills are (under normal conditions) inaccessible to crude conscious control processes which might otherwise undermine

the smooth co-ordinated execution of such skills. In essence, immersion in the activity itself does not leave the performer readily open to internal or external distracters, and hence they can be viewed as exerting complete (implicit) control over the execution of the skill.

The implications from the above are clear; in competitive situations, performers should set goals which are least likely to be externally controlled, or in the case of well learned skills, less likely to encourage self-analysis.

Prioritising state goals

The results from chapter 3 appear to substantiate the use of process goals as a primary focus during competition. However, within the discussion it is highlighted that while such goals may be important as a primary focus in a given situation, advocating their use exclusively might be somewhat short-sighted. In essence, it might prevent sports performers from realising a number of benefits (mainly motivational) that may be associated with other types of state goals. For example, performance goals may increase the salience of practice (Kingston & Hardy, 1994), whereas outcome goals may have strong motivational properties, especially during setbacks, and through many hours of gruelling training (Hemery, 1991; Hardy et al., 1996a). Therefore, according to Hardy et al., (1996a), derogating the use of outcome goals does not make a great deal of sense from a practical perspective. Another reason for supporting the use of outcome goals is that, when such goals are in doubt, performers may use the perception of likely failure to achieve their outcome goal as a cue for implementing strategies or focusing on the process (Kingston & Hardy, 1995). This demonstrates the view that state goals may change from moment to moment, especially within the context of ongoing performance. Therefore, when advocating a

specific goal-setting based strategy for enhancing or maintaining high levels of performance, researchers and practitioners need to: 1) acknowledge the dynamic nature of sport and associated cognitions; and 2) develop measurement tools that are more able to effectively predict and assess ongoing changes in the state goals that performers use. It seems clear that observational studies which permit access to within-performance thoughts and feelings would also benefit the literature greatly.

Measuring state goals

Associated with the need to access within performance goal-states is the requirement for valid and reliable measures of state perspectives to be developed. By doing so, researchers should be able to describe the relationship of person and situational factors to goal-states and performance in a more meaningful way. Describing goal-states in competitive situations might shed further light on the performance effects argued to be associated with the use of outcome, performance and process-based goals. Whilst accepting the obvious difficulties of assessing moment to moment changes in the prioritisation of state goals, an effective measure of goal-states should permit more meaningful cross-reference with individual goal orientation profiles. For example, a performer holding a high task/high ego orientation profile might be expected to possess goal states which (in a general sense) suggest a similar preference towards goals emphasising both social comparison and self-referenced learning, enjoyment or process.

Current criticisms of dispositional measures may, however, pre-empt the development of measures of state goal perspectives. As discussed in chapter 7, a dispositional measure is needed that is based on current conceptualisations of goal

orientations in the sporting context, rather than the behavioural or affective correlates of dispositions measured in less dynamic sport/exercise settings (see Duda, 1992).

The moderating effects of the social context

The view that a high level of task orientation in some way buffers against the potentially debilitating effects of a high ego orientation is becoming increasingly popular (Roberts et al., 1996; chapter 6, this thesis). Furthermore, the results from chapter 7 indicate that, in addition to goal orientation profiles discriminating between high and lower ability performers, a high level of task orientation pre-competition characterised the more skilled athlete. Therefore, it is reasonable to speculate that maintaining a high level of task orientation is important to effective performance most notably when the situation emphasises social comparison.

It seems obvious that the structure of competition emphasises, and in some cases elevates the status of social factors. In spite of sport's often "pervasive preoccupation with winning" (Burton, 1989 p. 105), it is clearly over-simplistic to limit social factors to those that focus on outperforming others. Demonstrating competence to friends and loved ones, selectors, etc. clearly influence the manner in which competition is viewed. While a high level of ego orientation suggests a degree of importance being attached to outperforming others it does not in anyway describe the factors that might underlie this state. The salience to the individual of such factors clearly has the potential to impinge on the predictive relationship between the situation/disposition with the state of involvement (a moderating effect). Hardy (1997), commenting on these results appears to support this proposition when describing how different populations, "may approach competition situations in radically different ways" (p. 284). Consideration of the perceived social context might

help to shed some light on the wide fluctuations in goal orientation profiles both within and across populations.

Confounding a process focus with a focus on the task

A consistent shortcoming within the goal perspectives literature is an inference that: a) individuals who hold high levels of ego orientation per-se focus on the social comparison aspects of performance; and b) those that hold high levels of task orientation (per-se) focus on the learning, enjoyment or mastery components of the skill. Hardy (1998) discussed this issue in his critique of the goal orientations literature, and more specifically criticised the individual items of the TEOSQ with regards to this point. He argued that task orientation confounds a process focus with a performance focus, and it is this issue that warrants further discussion here.

Taking a literal interpretation of the definitions for the goal orientations measured using TEOSQ, it can be inferred that a high level of ego orientation precludes the performer from performing the task for intrinsic reasons such as enjoyment, mastery, and learning, or from judging competence based upon some other self-referenced criteria, e.g. effort invested. This assessment is supported by the lack of association between high scores on the ego based sub-scale of TEOSQ and measures used to assess those intrinsic components of the task (see, for example Duda, 1993). However, the task orientation sub-scale contains items that measure effort and enjoyment for example, while the ego orientation sub-scale contains no such items. It is hardly surprising, therefore, that a high level of task orientation will correlate highly with effort, practice and enjoyment. This infers that, for the highly ego oriented performer there is no meaning given to effort, learning and enjoyment throughout the performance of the skill. There is certainly no logical reason why a

highly ego oriented individual (irrespective of their level of task orientation) should not engage in activities for these (process-based) reasons. Furthermore, they may serve as a primary focus for the athlete, (precisely) because they are known to serve as the mechanism through which certain outcome objectives can be realised (Hardy, 1997). One of the problems, however, in developing a tool that contains an effort scale that relates to outperforming others is that effort is often considered as being pertinent to the task demands rather than something external to the task (i.e. the opponent).

Therefore, modifications to measurement tools assessing goal orientations should ensure that items are cohesively focused on the definitions of task and ego orientations, and do not confound the defining qualities of task (or ego) orientation with their cognitive or affective correlates.

Practical implications

The ability to use and apply goal-setting in an effective manner is widely viewed as an important skill for both life and in the pursuit of sporting excellence. For the sport psychologist, understanding the value of specific types of goals and the underpinnings of the goal-setting process will help to guide practice. The studies which comprise the research element of this thesis can help to guide goal-setting practices and further our understanding of the antecedents of state goals. The current section focuses on a number of issues that might help to further clarify the practical application of the goal-setting research undertaken.

Adherence to mental training programmes

According to Boutcher and Rotella (1987) one of the key ingredients of a successful psychological skills educational programme was a constant striving to foster compliance and adherence. It has been argued elsewhere that psychological skills must become an integral part of an athlete's overall training programme, and learned and practiced on a regular and systematic basis in order to become effective (Bull, 1991; Harris & Harris, 1984). The discussions of chapters 3 and 4 highlight the importance of adherence to the potential effectiveness of psychological skills training. Even when the metal training programme is structured, there are large variations in mental training habits between individual athletes (Bull, 1991). Despite the fact that the goal-setting used by the participants in chapter 3 was discussed in depth, it is clear that the subjects involved may have varied widely in terms of their responses to, and the extent to which they practiced the skills being taught. Obviously these factors can impinge considerably on the effects shown through the intervention period, and although some checks were made they can provide only a relatively superficial account of the overall picture. Similarly, the development of the routine utilised with the participant of chapter 4 was, to an extent based on preconceived ideas regarding the nature of effective routines (see Boutcher & Rotella, 1987; Cohn, 1991).

In order to increase the level of adherence and perhaps the potential for development of effective psychological skills programmes, it may be necessary to give more consideration to the individual's: preferences; personality characteristics (e.g. dispositional goal orientation profiles); current psychological skills; ability levels; and other situational factors that may act as barriers to adherence (e.g., the

time-lag prior to benefits being realised). The impact of these factors might also provide an important thrust for future research.

Maintaining trust and self-confidence

Moore & Stevenson (1991) defined trust as, "the letting go of conscious control tendencies and allowing automatic processes....., to execute the motor skill" (p.282). It has been suggested that one of the principle determinants of a peak performance state is effortless, automatic performance - the absence of conscious thought and total immersion in the present (Cohn, 1991; Loehr, 1992; Ravizza, 1977). Consequently, it is clear that the ability to maintain a state of trust in ones capabilities to execute a skill might have important ramifications for performance. The definition of trust immediately highlights its role when using well-learned (automated) process goals (particularly those of a holistic nature) or when using an established pre-performance routine. Developing trust should help to prevent performers from becoming preoccupied with the negative connotations associated with self-doubt (e.g. conscious processing), and allow them to maintain a state allowing for the smooth execution of the task. With higher level performers in particular, it may be more efficacious to work on maintaining trust than further training of specific psychological skills. Moore and Stevenson (1991), however, would argue that such skills are essential if a state of trust is to be realised.

Maintaining a clear and present focus on the task could well be thought of as a consequence of trust. Similarly, a state of trust might be a consequence of a high level of self-efficacy with a lack of self-doubt regarding one's ability to realise personal goals. Either way, it is apparent that certain psychological states or personality characteristics might enhance or inhibit trust. The goal for coaches and sport

psychology practitioners is to further understand ways in which trust can be developed and, perhaps more importantly (in the context of psychological skills training), help to provide a psychological platform on which performers can build a state of trust.

Alternatives to holistic process goals

The discussion of chapter 3 argued that the use of single process oriented goals may have detrimental effects upon performance, most notably when the tasks are relatively well-learned and hence performed without recourse to explicit rules. The use of holistic process goals was posited as a suggestion to overcome these effects.

Nevertheless, despite some preliminary research in support of this idea, there may be a number of alternative strategies for practice and for developing new skills. This is not to question the potential benefits of process goals (tailored to the needs of the performer and the situation, they may be of considerable benefit), but rather to identify whether there are alternate approaches which may serve similarly beneficial roles in terms of maintaining a process focus, but avoid the potential for regression under stressful conditions. Two such approaches could be the inner game methods (see, Gallwey, 1981), or coaching by analogy. Both are identifiable by the lack of explicit rules associated with their application, and which may prevent the performer from regressing to crude control strategies under stress. Research with badminton and tennis-players by Hardy and Ringland, (1987) suggests that Inner Game coaching might be more effective than traditional coaching for competitive performance. While such methods are primarily applicable to learning paradigms, this does not preclude this approach from being adapted and applied to the later stages of learning, or perhaps to highly skilled performers.

Future research should examine methods by which such strategies could be applied to performers who have already learned in the traditional manner via the explicit to implicit performance route.

Developing an adaptive goal orientation profile

The discussion of chapter 3 highlighted the potential benefits and shortcomings associated with a number of goals states and their existence in certain situations. Chapters 5 to 7 further supported the contention that these states may be a consequence of the interaction between the individual's goal orientation and their perception of the situational factors. Therefore, it seems logical that the most efficacious goal states are inextricably linked to holding an adaptive goal orientation profile for the situation in question.

The results from chapter 6 suggest that certain profiles are more beneficial to performance under competition conditions. Furthermore, the results from chapters 5 and 7 indicate that ability level can be used to differentiate between those holding more or less adaptive goal orientation profiles. Even accepting that the method of profiling may be over-simplistic, this finding provides a reasonable argument for attempting to modify the criteria that performers use to gauge perceptions of ability. For both high and lower level performers, it is apparent that a high level of task orientation is desirable irrespective of a high or low level of ego orientation. However, while a high level of ego orientation may be beneficial for those with high ability (and presumably a generally high level of perceived competence), an attempt should be made to downplay the importance of social comparison based judgements of ability (prior to competition) for those less able performers (i.e. those with lower perceived copmpetence).

Methodological and statistical issues

One of the strengths of this thesis is the wide range of methodological and statistical approaches that have been used to address the various research questions. Although there remains a number of important omissions in terms of design (e.g. the lack of a qualitative element), the research questions addressed have raised a number of important methodological and statistical issues which are worthy of further discussion.

The use of 'control' subjects

The use of control subjects has long been advocated as a method of strengthening the design of group comparison based studies. This trend has been reflected within sport psychology research. The discussion of chapter 3 highlighted the potential problems that might be associated with the use of control subjects over a protracted period of study. In addition to the difficulties of maintaining a 'clean' control condition, the specific reasons for non-participation, and the implications for design of studies are widespread.

Bull (1991) carried out a study which attempted to shed some light on the nature of control subjects. His control subjects chose to complete the questionnaires over a long period of time, yet not participate in the training programme (similar to the control subjects in chapter 3). Bull found that the control subjects had lower levels of sport motivation, yet higher levels of concentration than those who volunteered to participate in the training programme. It may well be the case that the subjects did not wish to participate because they perceived their level of concentration to be high, and thus felt that the did not require the services of a sport psychologist. It is may be optimistic to view such individuals as 'good-guys' who were willing to participate

without any reward. The more cynical might question why such individuals would do so, and suggest that they were perhaps hoping to realise some benefits without the additional costs of attending the mental training programme.

In addition to the undoubted ethical issues of using no-information control subjects, there may be substantial cognitive and motivational differences between those individuals who chose to fully participate in studies such as those of Bull (1991) and chapter 3 (this thesis), and those who do not. It may be that extremely valuable information is lost when individuals either, drop-out of longitudinal studies or choose not to participate to start with. In the absence of truly randomised designs, it is possible that those subjects for whom we have completed data represent (at the very least) a motivationally biased population.

Multiple-baseline designs

The data collected for the case-study in chapter 4 conformed to a single-case multiple-baseline design. Multiple-baseline designs permit the testing of predictions across different behaviours, and allow for inferences to be made regarding the efficacy of interventions administered across different time periods. The use of analysis of variance has been discussed in chapter 4. Nevertheless, assuming appropriate data requirements alternative techniques such as time-series analysis or split middle techniques could be applied to multiple baseline data.

Although there is increasing support for the use of such designs (see, Shambrook & Bull, 1996), some cautionary notes are important. One of the principle concerns of single-case research designs regards the generalisation of results, i.e., do the effects transfer to different persons? Clearly, very specific individual pre-performance routine training as carried out with the participant in chapter 4 does not

permit such an inference, but merely allows for guiding best practice. Carrying out a series of such interventions with different subjects would clearly paint a more vivid picture regarding their specific effects upon performance. A second issue which arises when multiple-baseline interventions are carried out over a protracted period of time relates to the possible interdependence of the baselines (Kazdin, 1982). In essence, there is a possibility that change in one baseline carries over to another even though the intervention has not been extended to the latter. Certainly this type of patterning appears to be demonstrated in the results of chapter 4, although the changes are non-significant. This might be especially relevant when a general behavioural intervention is being applied. Possible strategies to circumvent this problem include: minimising the delay between the introduction of the intervention; introducing the treatment to more than one behaviour at any one time (see, chapter 4); and reducing the number of baseline observations. However, all of these strategies reduce the power of the data to demonstrate specific causal effects.

Moderating effects of ability

The potential for ability to have a moderating effect on the relationship between different types of process goals and performance arises from the discussion in chapter 3. Furthermore, evidence exists within chapters 4 and 6 that the ability levels of golfers influences their use of different types of goals under different conditions. Therefore, although there may be some similarity in the types of goals that performers of differing levels of ability use, there may be significant differences in the way in which these goals are applied during performance. It is logical to suppose that (because of their higher skill level) more able performers 'generally' use goal-setting in a more adaptive fashion than their less able counterparts. For example, an

individual holding simultaneously high levels of task and ego orientation is argued to readily set goals that reflect tendencies to use both normative and subjective criteria for success. Such a performer might reasonably focus on wanting to make a birdie (one under par) on the final hole to win a tournament, yet, when stood over the ball may switch the focus of attention to some sort of process based goal (perhaps to elicit a state of automaticity). The reason he/she switches in this way may be precisely because he/she understands (or believes) that such a state will optimise their chances of making the birdie (and winning). It is clear, therefore, that psychological interventions (and experiments to test their effects), and in particular those that focus on goal-setting practices need to give careful consideration to performers' ability levels, as these might considerably effect the way in which goals are used.

Goal orientation profiles and quadrant analysis

To test the interactive effects of task and ego orientations on performance, the data generated for the study in chapter 6 was analysed using quadrant analysis. As discussed previously, this involved dichotomising the goal orientations in order to classify individuals into one of four goal orientation profiles (high/low task X high/low ego), and examining their effects upon performance using a simple two-factor ANOVA. While this type of analyses provides a meaningful method of comparing combined high and low levels of task and ego orientations, it can be criticised on a number of levels.

An obvious concern resulting from the process of dichotomising a 5-point Likert-like scale (which is normally continuous) is the compromising of the measurement tools sensitivity. Jaccard et al (1990) argue that this method is crude and unsatisfactory, having adverse effects on the proportion of the variance that can be

accounted for, and the statistical power (Cohen, 1988). Furthermore, using a median or mean split to discriminate between the groups can paint a somewhat misleading picture. For example, an individual could hold a level of task orientation considerably above the scale mean, yet still be classified as having a low level because of the negative skewness of the task orientation sub-scale. An alternate profiling approach could be to use an extreme group split for comparison purposes, which might involve groups comprising of those below the 25^{th} or above the 75^{th} percentile on each scale. However, because of the sample size requirements and the high degree of wastage, a more practical solution might be to generate profiles of high, moderate and low levels of task and ego orientations.

An alternative approach to generating profiles to test interactive effects would be to use the more refined moderated hierarchical regression analysis. This multiple regression procedure determines the extent to which the standardised values for the independent variables (in this case the levels of task and ego orientation) predict competition performance. The analysis involves forming a multiplicative term, which is said to encompass the interactive effect of the two independent variables (Jaccard et al., 1990). This value is calculated by simply multiplying the standardised values representing the level of task and ego orientations. A hierarchical regression procedure is then used to determine whether the interaction term significantly predicts performance over and above the sum of the independent effects of the task and ego orientations. According to Hardy (1998) this would "enable researchers to more directly assess both the interactive effects of goal orientations and the proportions of variance accounted for by differences in goal orientations." (p. 216). Nevertheless, the increased conservatism of such an analysis may reduce the likelihood of meaningful

results being demonstrated from an exploratory study. Furthermore, because the multiplicative term used describe the interactive product can introduce high levels of multicollinearity, critics have argued against their use (see Jaccard et al., 1990).

A further argument for not utilising the moderated hierarchical regression approach can be made based on interactive effects not always being continuous in nature (e.g., catastrophe model). Moderated hierarchical regression procedures are unlikely to identify such effects, and perhaps more importantly, the non-continuity of the interaction undermines their application (Hardy, personal communication)..

Nevertheless, it is possible to test the non-continuity of interactive effects (of high or low levels of task orientation and ego orientation) on performance. This is achieved by dichotomising one of the variables (in this case the task orientation data) and comparing statistically the regression slopes of the performance prediction lines (see Kerlinger & Pedhazur, 1973) for each of the two groups (high task and low task). Clearly, if performance is non-continuous, then there will be a marked difference in the path of the lines.

Strengths and Limitations of the thesis

One of the principle strengths of this thesis is its diversity. In contrast with many traditional research theses, where a single issue is examined in great detail, the current work reflects more accurately the process of engaging in research at a time when the jigsaw that describes human performance from a psychological perspective is very slowly pieced together across a prolonged period of time. It is clear that psychological theories which describe large amounts of variance in performance are few and far between. Consequently, the ability to follow and develop a line of

research clearly represents a meaningful method for progressing the understanding of the relationship between psychology and sports performance. Furthermore, taking a critical perspective which continually questions the status quo, can positively influence the way in which psychological phenomena (related to sport) are described, assessed, or even fundamentally viewed.

The five discrete studies which make-up the research aspect of this thesis are, to a varying extent inter-related. Nevertheless, a further goal of research training is to develop skills in writing and publishing research articles, and with this in mind, each of the studies can stand alone as a discrete research paper, examining an individual topic and addressing a single question. Utilising feedback obtained from peer-reviewed journals can certainly enable one to further develop skills in both the way in which questions can be addressed and the manner in which such information is conveyed.

Another major strength of this particular research thesis is the variety of designs and methodologies used. While it is clear that there are some shortcomings with some of the procedures used, the studies do nevertheless represent a broad spectrum of quantitative approaches. The study comprising Chapter 3 was a longitudinal study with a quasi-experimental design. Chapter 4, while addressing a similar issue related to mental training, used a case-study approach with a multiple-baseline design. The research question in chapter 5 sought to confirm/negate the stability of a measurement tool purported to measure dispositional factors using a mixed-model design. The research question in chapter 6 utilised a single-shot questionnaire design, together with a quadrant analysis, and finally the study in chapter 7 used a correlation based design (discriminant function analyses) to

determine the predictive ability of goal orientations across a number of situations. Clearly, the variability in the procedures used allow for the development of an understanding of the potential methodologies that can be applied to quantitative data, and an ability to utilise that analysis most suited to the question/design at hand.

Although the above presents a case for the strength of this research thesis, one could also argue that such a thesis structure is a limitation. It could be argued that examining a relatively narrow topic in a more exhaustive fashion might lead to a greater appreciation of the research issues, whereas taking such a broad perspective may result in a more superficial understanding of a number of areas. However, it is hoped that by taking a critical perspective the writer has demonstrated an appropriate depth of understanding of the key issues associated with the questions, designs and statistical analyses applied.

More specific limitations not associated with the general structure of the thesis involve those types of research design or methodologies not employed. Perhaps the most obvious omission is a qualitative element. The case study reported in chapter 4 does at least present a more ideographic approach, but only in so far that it allows us to make inferences or generalisations to the wider population. Perhaps the most salient application of such an approach in this thesis would be to permit a more detailed understanding of the goal-setting process, especially during sports performance. In turn this may lead to a greater understanding of the underlying dispositional and situational factors that underpin the goals that we prefer. Another important omission from the current work is a purely psychometric based study. Chapters 5 and 6 in particular criticise the application of TEOSQ as a measure of goal orientations, but fail to provide an alternative. The development of psychometric tools to assess goal-

setting practices, or perhaps a more refined measure of goal orientations might prove to be what is needed to enable meaningful strides to be made in this area of research.

To conclude, while the structure of this thesis certainly supports the process of research training, it is acknowledged that the absence of certain design types represents an important limitation of this project.

Future research directions

This thesis has reinforced the importance of goal-setting within sport, and highlighted the existence of individual differences in sports performers' goal-setting practices. However, although some clarification of the research area has been achieved, the thesis has raised a number of issues that require further attention for the research in this area to move forward. Some of these have been mentioned within the individual discussions. This final section will highlight a number of the key issues in more detail. It is divided into two parts: issues that relate to goal-setting as a skill that can be trained; and issues concerned with goal-setting tendencies as an individual difference factor.

Future research into goal-setting as psychological skill

It is clear from the research reported within this text and from reports of applied work (with athletes of different ability levels) that performers use any number of different goals and goal types to direct their attention and efforts (see Hardy et al., 1996a); Orlick & Partington, 1988). While evaluation of goal-setting training programmes (in their various forms) can guide practice and further the understanding of the goal-setting process, it does not in any way describe moment to moment fluctuations in goal states and their relationship with the dynamic processes that occur

within sporting situations. A potentially fruitful area for future research to explore would be to examine the nature of dynamic goal states, and the factors that underpin changing goal states (for example, attentional strategies; locus of control; perceived challenge). An obvious channel through which such issues could be addressed is via post-performance interviews, where qualitative information was used to guide the development of effective assessment tools.

While the study of chapter 3 examined the impact of a goal-setting training programme over the course of 12 -months, it is clear that considerably more research is required which examines the long-term behavioural and cognitive effects that may be elicited as a consequence of a detailed structured goal-setting training programme. The nature of competitive sport with its emphasis on social comparison as a criterion for evaluating success and failure ensures that adaptive goal-setting practices may need to be constantly reinforced if they are to become an integral part of an individual's preparation and execution of sport skills. Similarly, case-studies which look at the longer-term effects of pre-performance routine training might help to paint a clearer picture of the relationship between the stability of behaviours (and perhaps cognitions) and tangible performance improvements. Monitoring this process and gathering detailed information from athletes with regards to the process of using performance routines would help to guide the development and implementation of future training of these skills.

Finally, with regards to goal-setting as a psychological skill, it is apparent that process oriented goals (in their different forms) may have substantially different effects as a function of the ability level of the performer. Further studies are required to clarify our understanding of the impact of part and holistic process goals on

performance, especially in terms of their impact on the actual execution of the skill. Certainly the effects of cognitions on the execution of fine movements represents an interesting applied focus for movement analysis based research.

Future research into goals as an individual difference factor

Continuing with the critical perspective adopted throughout, the points raised in this sub-section generally relate to the measurement of individual goal perspectives within the sporting context. Perhaps the most fundamental issue that requires attention within this area is the definition and measurement of goal perspectives in sport. The task and ego orientation in sport questionnaire (TEOSQ) has certainly provided a lead, stimulating a considerable amount of insightful research. However, there are a number of shortcomings associated with this tool which have been discussed in some detail elsewhere (see Hardy 1997; 1998; Harwood, Hardy & Swain, in press), and appear to undermine its use within the sporting domain. A key issue is clarifying the relationship between goal orientations, defined as; 'the tendency to be task and ego involved in sport', and goal states. An effective and meaningful measure of goal orientations should permit the prediction of states of task and ego involvement in a particular sporting context. Furthermore, it is imperative that researchers acknowledge the independence of goal orientations, and that this independence is reflected in the measurement and definitions regarding states of involvement.

Associated with the measurement of goal orientations, (and more specifically the potentially transient nature of the criteria that performers use to define success and failure) is the need to examine situational and contextual factors that impinge upon the robustness of such dispositional tendencies. Further studies examining the potentially

moderating effects of the motivational climate, and its underpinnings may prove fruitful in the understanding of factors that might undermine adaptive goal-setting practices (e.g. structure of competition/practice or coaching styles).

The use of goal orientation profiles to determine the interactive effects of task and ego orientation is increasingly viewed as a legitimate statistical approach (see chapter 6). However, it needs to be acknowledged that the quadrant analysis adopted in the present thesis, while appropriate to determine interactive effects, is nevertheless somewhat simplistic. Indeed, the results obtained may even be misleading because of the way in which dichotomised profiles undermine the sensitivity of the measurement tools used. Future researchers should be encouraged to take recent leads towards examining the interactive effects of task and ego orientation/involvement, it is hoped that the current thesis provides (at the very least) something of a 'nudge in the right direction'.

To summarise, the areas of goal-setting as a psychological skill and an individual difference factor have largely been explored at a relatively superficial level. Nevertheless, an appreciation of the gaps in the knowledge base, and the contentious issues which require clarification in order for the area to move on is occuring. If this thesis were to tell a story, it would simply be, that goals should be used in an appropriate context, and consideration should be given to individual differences when advocating the use of different goal types. Furthermore, It is hoped that the ripples created by this particular drop in the ocean might reverberate, and when added to, might help to create the waves which will shape the empirical landscape withing goal-setting. Furthermore, this evolving environment will, it is hoped, provide the ground on which future research and application within this area can be based.

References

Albinson, J.G., & Bull, S.J. (1988) A mental game plan. Ontario: Spodym Publishers.

Ames, C. (1992) Achievement Goals, Motivational Climate, and Motivational Processes. In Motivation in Sport and Exercise (edited by G.C. Roberts), pp. 161-176. Champaign, IL: Human Kinetics.

Anderson, D.C., Crowell, C.R., Doman, M., & Howard, G.S. (1988) Performance posting, goal-setting, and activity-contingent praise as applied to a university hockey team. Journal of Applied Psychology, 73, 87-95.

Bandura, A. (1977) Self-efficacy: Towards a unifying theory of behavioural change. Psychlogical Review, 84, 191-215.

Baumeister, R.F. (1984) Choking under pressure: Self-consciousness and paradoxical effects of incentives on skilful performance. Journal of Personality and Social Psychology, 46, 610-620.

Beauchamp, P.H., Halliwell, W.R., Fournier, J.F., & Koestner, R. (1996) Effects of Cognitive-Behavioural Psychological Skills Training on the Motivation, Preparation, and Putting Performance of Novice Golfers. The Sport Psychologist, 10, 157-170.

Beggs, A. (1990). Goal-setting in sport. In Jones and Hardy (Eds) Stress and performance in sport. Chichester: John Wiley

Boutcher, S.H. (1990) The Role of Performance Routines in Sport. In Jones, J.G. & Hardy, L., Stress and Performance in Sport, Wiley.

Boutcher, S.H., & Crews, D.J. (1987) The effect of a preshot routine on a well-learned skill. International Journal of Sport Psychology, 18, 30-39.

Boutcher, S.H., & Rotella, R.J. (1987) A psychological skills educational program for closed-skill performance enhancement. The Sport Psychologist, 1, 200-207.

Boutcher, S.H., & Zinsser, N.W. (1990) Cardiac deceleration of elite and beginning golfers during putting. Journal of Sport and Exercise Psychology, 12, 37-47.

Brawley, L.R., Carron, A.V., & Widmeyer, W.N. (1992) The nature of group goals in sport teams: A phenomenological analysis. The Sport Psychologist, 6, 323-333.

Brunel, P.C., & Avanzini, G. (1997) Achievement orientation and intrinsic motivation at the Olympic Games. Journal of Sport and Exercise Psychology, 19, S36.

Bull, S.J. (1991) Personal and situational influences on adherence to mental skills training. Journal of Sport and Exercise Psychology, 13, 121-132.

Burton, D. (1988) Do anxious swimmers swim slower? Re-examining the elusive anxiety-performance relationship. Journal of Sport and Exercise Psychology, 10, 45-61.

Burton, D. (1989) Winning isn't everything: Examining the impact of performance goals on collegiate swimmers' cognitions and performance. The Sport Psychologist, 3, 105-132.

Burton, D. (1992) The Jekyll/Hyde Nature of Goals: Reconceptualizing Goal Setting in Sport. In Advances in Sport Psychology (edited by T. S. Horn), pp. 267-297. Champaign, IL: Human Kinetics.

Cohen, J. (1988) Statistical Power Analysis for the Behavioural Sciences. Hillsdale, NJ: Lawrence Erlbaum.

Cohn, P.J. (1990) Preperformance routines in sport: Theoretical support and

practical applications. The Sport Psychologist, 4, 301-312.

Cohn, P.J. (1991) An exploratory study on peak performance in golf. The Sport Psychologist, 5, 1-14.

Cohn, P.J., Rotella, R.J. & Lloyd, J.W. (1990) Effects of a cognitive behavioural intervention on the preshot routine and performance in golf. The Sport Psychologist, 4, 33-47.

Crews, D.J. (1994) Research Based Golf: From the Laboratory to the Course. In Farrally M. and Cochran A., Science and Golf 2. (pp.127-137). London: Chapman-Hill.

Crews, D.J., & Boutcher, S.H. (1986) The effect of structured preshot behaviours on beginning golf performance. Perceptual and Motor Skills, 62, 291-294.

Crews, D.J., & Boutcher, S.H. (1987) An observational analysis of professional female golfers during tournament play. Journal of Sport Behaviour, 9, 51-58.

Deci, E..L., & Ryan, R.M. (1985) Intrinsic Motivation and Self Determination in Human Behavior. New York, NY: Plenum Press.

Duda, J.L. (1988) The relationship between goal perspectives, persistence, and behavioral intensity among male and female recreational sport participants. Leisure Sciences, 10, 95-106.

Duda, J.L. (1989) Goal perspectives, participation and persistence in sport, International Journal of Sport Psychology, 20, 42-56.

Duda, J.L. (1992) Motivation in sport settings: A goal perspective approach. In G.C. Roberts (Ed.), Motivation in sport and exercise, (pp. 57-92). Champaign, IL: Human Kinetics.

Duda, J.L. (1993) Goals: A Social-Cognitive Approach to the Study of Achievement Motivation in Sport. In Handbook of Research in Sport Psychology (edited by R.N. Singer, M. Murphey, and L.K. Tennant), pp. 421-436. St. Louis, MO: McMillan.

Duda, J.L., Fox, K., Biddle, S., & Armstrong, N. (1992). Children's achievement goals and beliefs about success in sport. British Journal of Educational Psychology, 62, 313-323.

Duda, J.L., & Nicholls, J.G. (1992) Dimensions of achievement motivation in schoolwork and sport. Journal of Educational Psychology, 84, 290-299.

Duda, J.L., Smart, A., & Tappe, M. (1989) Personal investment in the rehabilitation of athletic injuries. Journal of Sport and Exercise Psychology, 11, 367-381.

Duda, J.L., & White, S.A. (1992) Goal orientations and beliefs about the causes of sport success among elite skiers. The Sport Psychologist, 6, 334-343.

Duda, J.L., & Whitehead, J. (1998) Measurement of goal perspectives in the physical domain. In J.L. Duda (Ed.), Advances in sport and exercise psychology measures (pp. 21-48). Morgantown, WV: Fitness Information Technology.

Dweck, C.S., & Leggett, E.L. (1988) A social-cognitive approach to motivation and personality. Psychological Review, 95, 256-273.

Fitts, P.M., & Posner, M.I. (1967) Human Performance. Belmont, CA: Brooks/Cole.

Fox, K., Goudas, M., Biddle, S., Duda, J.L., & Armstrong, N. (1994) Children's task and ego goal profiles in sport. British Journal of Educational Psychology, 64, 253-261.

Gallwey, W.T. (1986) The inner game of golf. Macmillan, London.

Goudas, M., Fox, K., Biddle, S., & Armstrong, N. (1992) Children's task and ego

goal profiles in sport: Relationships with perceived competence, enjoyment and participation. Journal of Sport Sciences, 10, 6, 606-607.

Gould, D. (1993) Goal setting for peak performance. In J.M. Williams (Ed.), Applied Sport Psychology: Personal growth to Peak performance (2nd ed., pp. 158-169). Mountain View, CA: Mayfield.

Gould, D., Eklund, R.C., and Jackson, S.A. (1992) 1988 U.S. Olympic wrestling excellence: I Mental preparation, precompetitive cognition and affect, The Sport Psychologist, 6, 358-362.

Gould, D., Weinberg, R., & Jackson, A. (1980) Mental preparation strategies, cognitions, and strength performance. Journal of Sport Psychology, 2, 329-339.

Greenspan, M.J., & Feltz, D.L. (1989) Psychological Interventions with athletes in competitive situations: A review. The Sport Psychologist, 3, 219-236.

Hall, H.K., & Byrne, T.J. (1988) Goal setting in sport: Clarifying recent anomalies. Journal of Sport and Exercise Psychology, 10, 184-198.

Hall, H.K., & Kerr, A.W. (1998) Predicting achievement anxiety: A socail-cognitive perspective. Journal of Sport and Exercise Psychology, 20, 98-111.

Hall, H.K., Kerr, A.W., and Matthews, J. (1998) Precompetitive anxiety in sport: The contribution of achievement goals and perfectionism. Journal of Sport and Exercise Psychology, 20, 194-217.

Hardy, L. (1997) The Coleman Roberts Griffith Address: Three myths about applied consultancy work. Journal of Applied Sport Psychology, 9, 277-294.

Hardy, L. (1998) Responses to the respondents on the three myths. Journal of Applied Sport Psychology, 10, 212-219.

Hardy, L., & Jones, J.G. (1994) Current issues and future directions for performance-related research in sport psychology. Journal of Sport Sciences, 12, 61-92.

Hardy, L., Jones, J.G., & Gould, D. (1996a) Understanding psychological preparation for sport. Theory and practice of elite performers. Chichester: John Wiley.

Hardy, L., Mullen, R., & Jones, J.G. (1996b) Knowledge and conscious control of motor actions under stress. British Journal of Psychology, 87, 621-636.

Hardy, L., & Nelson, D. (1988) Self control training in sport and work. Ergonomics, 31, 1573-1585.

Hardy, L., & Parfitt, G. (1994) The development of a model for the provision of psychological support to a national squad. The Sport Psychologist, 8, 126-142.

Hardy, L., & Ringland, A. (1984) Mental training and the inner game. Human Learning, 3, 203-207.

Harris, D.V., & Harris, B.L. (1984) The Athlete's Guide To Sport Psychology: Mental Skills For Physical People, Leisure Press, Champaign, Illinois.

Harwood, C.G., Hardy, L., & Swain, A.B. (in press) Achievement goals in competitive sport: A critique of conceptual and measurement issues.

Harwood, C.G., & Swain, A.B. (1998) Antecedents of pre-competition achievement goals in elite junior tennis players. Journal of Sport Sciences, 16, 357-371.

Hemery, D. (1986) The Pursuit of Sporting Excellence. Collins, London.

Hemery, D. (1991) Sporting Excellence: What makes a Champion (2nd Ed.), Wiley, New York.

Huynh, H., & Feldt, L.S. (1976) Estimation of the Box correction for degrees of freedom from sample data in the randomized block and split plot designs. Journal of Educational Statistics,1, 69-82.

Jaccard, J., Turrisi, R., & Wan, C.K. (1990) Interaction effects in multiple regression. Sage University Paper series on Quantitiative Applications in the Social Sciences, 72. Newbury Park, CA: Sage.

Jones, G., & Hanton, S. (1996) Interpretation of competitive anxiety symptoms and goal attainment expectancies. Journal of Sport and Exercise Psychology, 18, 2, 144-157.

Jones, J.G., & Hardy, L. (1990) Stress and Performance in Sport. Chichester: John Wiley.

Jones, J.G., Swain, A.B.J., & Cale, A. (1990) Antecedents of multidimensional competitive state anxiety and self confidence in elite intercollegiate middle distance runners, The Sport Psychologist, 4, 107-118.

Kazdin, A.E. (1982) Single-case research designs: Methods for clinical and applied settings. Oxford: Oxford University Press.

Kerlinger, F.R., & Pedhazur, E.J. (1973) Multiple Regression in Behavioural Research. Holt, Rinehart and Winston, New York, NY.

Kingston, K., & Hardy, L. (1994) Factors affecting the salience of outcome, performance and process goals in golf. In A. Cochran & M. Farrally (Eds.), Science and Golf 2, (pp.144-149). London: Chapman-Hill.

Kingston, K., & Hardy, L. (1995) Directives for goal-setting in applied situations. Journal of Applied Sport Psychology, 7, S81.

Kingston, K., & Hardy, L. (1997) Effects of different goals on processes that support performance. The Sport Psychologist, 11, 277-293.

Kingston, K., Hardy, L., & Markland, D. (1992) Study to compare the effect of two different goal orientations and stress levels on a number of situationally

relevant performance sub-components. Journal of Sport Sciences, 10, 610-611.

Kingston, K., & Swain, A. (1998) Goal orientations and state goals: Research in golf and implications for performance. In M. Farrally & A. Cochran (Eds.) Science and Golf 3, pp. 150-157. Champaign, IL: Human Kinetics.

Lobmeyer, D.L., & Wasserman, E.A. (1986) Preliminaries to free throw shooting: Superstitious behaviour, Journal of Sport Behaviour 11, 70-78.

Locke, E.A., & Latham, G.P. (1985) The application of goal setting to sports. Journal of Sports Psychology, 7, 205-222.

Locke, E.A., & Latham, G.P. (1990) A theory of goal setting and task performance. Englewood Cliffs, New Jersey: Prentice-Hall.

Locke, E.A. (1968) Toward a theory of task motivation and incentives. Organisational Behaviour and Human Performance, 3, 157-189.

Locke, E.A. (1991) Problems with goal setting research in sports - and their solution. Journal of Sport and Exercise Psychology, 13, 311-316.

Locke, E.A. (1994) Comments of Weinberg and Weigand. Journal of Sport and Exercise Psychology, 16, 212-215.

Locke, E.A., Shaw, K.N., Saari, L.M., & Latham, G.P. (1981) Goal setting and task performance: 1969-1980. Psychological Bulletin, 90, 125-152.

Loehr, J. (1992) Athletic excellence: Mental toughness training for sport. Denver, CO: Forum.

Mace, R. (1990) Cognitive behavioural interventions in sport. In J.G. Jones and L. Hardy (eds), Stress and Performance in Sport, Wiley, Chichester, pp.203-230.

Mahoney, M.J., & Avener, M. (1977) Psychology of the elite athlete: An exploratory study, Cognitive Therapy and Research, 1, 135-141.

Martens, R., Burton, D., Vealey, R.S., Bump, L.A., & Smith, E.D. (1990) Competitive state anxiety Inventory- 2. In R. Martens, R. Vealey & D. Burton (Eds), Competitive anxiety in sport. Champaign, IL: Human Kinetics.

Masters, R.S.W. (1992) Knowledge, knerves and know-how. British Journal of Psychology, 83, 343-358.

McCaffrey, N., & Orlick, T. (1989) Mental factors related to excellence among top professional golfers. International Journal of Sport Psychology, 20, 256-278.

Miller, J.T., & McAuley, E. (1987) Effects of a goal setting training program on basketball free throw, self- efficacy and performance. The Sport Psychologist, 1, 103-113.

Moore, W.E., & Stevenson, J.R. (1991) Understanding Trust in the Performance of Complex Automatic Sport Skills. The Sport Psychologist, 5, 281-289.

Murphy, S.M. (1994) Imagery interventions in Sport, Medicine and Science in Sports and Exercise, 26, 486-494.

Murphy, S.M., & Woolfolk, R.L. (1987) The Effects of Cognitive Interventions on Competitive Anxiety and Performance on a Fine Motor Skill Accuracy Task. International Journal of Sport Psychology, 18, 152-166.

Nelson, D., & Hardy, L. (1990) The development of an empirically validated tool for measuring psychological skill in sport. Journal of Sport Sciences, 8, 71.

Newton, M., & Duda, J.L. (1995) Relations of goal orientations and expectations on multidimensional state anxiety. Perceptual and Motor Skills, 81, 1107-1112.

Nicholls, J.G. (1989) The Competitive Ethos and Democratic Education. Cambridge, MA: Harvard University Press.

Nicholls, J.G. (1992) The general and the specific in the development and expression of achievement motivation. In G.C. Roberts (Ed.), Motivation in sport and exercise, (pp. 31-56). Champaign, IL: Human Kinetics.

Nicholls, J.G., Patashnick, M., & Nolen, S.B. (1985) Adolescents' theories of education. Journal of Educational Psychology, 77, 683-692.

Ommundsen, Y., & Roberts, G.C. (1996) Goal orientations and perceived purposes of training among elite athletes. Perceptual and Motor Skills, 83, 463-471.

Orlick, T. (1986) Psyching for sport: Mental training for athletes. Champaign, IL: Human Kinetics.

Orlick, T., & Partington, J. (1988) Mental links to excellence. The Sport Psychologist, 2, 105-131.

Ravizza, K. (1977) Peak experiences in sport. Journal of Humanistic Psychology, 17, 35-40.

Reber, A.S. (1993) Implicit Learning and Tacit Knowledge. Oxford: Oxford University Press.

Roberts, G.C. (1986) The growing child and the perception of competitive stress in sport. In G. Gleeson (Ed.), The growing child in competitive sport, (pp. 130-144). London: Hodder and Stroughton.

Roberts, G.C. (1992) Motivation in sport and exercise: Conceptual constraints and convergence. In G.C. Roberts (Ed.), Motivation in sport and exercise, (pp. 3-29). Champaign, IL: Human Kinetics.

Roberts, G.C & Balague, G. (1991, August) The development and validation of the Perceptions of Success Questionnaire. Paper presented at the FEPSAC Congress, Cologne, Germany

Roberts, G.C., Treasure, D.C., & Balague, G. (1998) Achievement goals in sport: The development and validation of the Perceptions of Success Questionnaire. Journal of Sport Sciences, 16, 337-347.

Roberts, G.C., Treasure, D.C., & Kavussanu, M. (1996) Orthogonality of achievement goals and its relationship to beliefs about success and satisfaction in sport. The Sport Psychologist, 10, 398-408.

Schmidt, R.A. (1975) A schema theory of discrete motor skill learning, Psychological Bulletin, 76, 92-104.

Schmidt, R.A. (1988) Motor Control and Learning: A Behavioural Emphasis. Human Kinetics, Champaign, IL.

Schutz, R.W., & Gessaroli, M.E. (1987) The analysis of repeated measures designs involving multiple dependent variables. Research Quarterly for Exercise and Sport, 58, 2, 132-149.

Shambrook, C.J., & Bull, S.J. (1996) The use of a single-case research design to investigate the efficacy of imagery training. Journal of Applied Sport Psychology, 8, 27-43.

Shelton. A.O., & Mahoney, M.J. (1978) The content and effect of "psyching-up" strategies in weightlifters. Cognitive Therapy and Research, 2, 275-284.

Singer, R.N. (1988) Strategies & Metastrategies in Learning and Performing Self-Paced Athletic Skills. The Sport Psychologist, 2, 49-68.

Southard, D., Miracle, A., & Landwer, G. (1989) Ritual and free-throw shooting in basketball. Journal of Sport Sciences, 7, 163-173.

Steven, J. (1986) Applied multivariate statistics for the social sciences. Hillsdale, NJ: L. Erlbaum Associates.

Swain, A.B., & Jones, J.G. (1995) Effects of goal setting interventions on selected basketball skills: A single-subject design. Research Quarterly for Exercise and Sport, 1, 51-63.

Swain, A.B.J. & Harwood, C.G. (1996) Antecedents of state goals in age-group swimmers: An interactionist perspective. Journal of Sports Sciences, 14, 111-124.

Thomas, P.R., & Over, R. (1994) Psychological and psychomotor skills associated with performance in golf. The Sport Psychologist, 8, 73-86.

Treasure, D.C. (1997) Perceptions of the motivational climate and elementary scholl children's cognitive and affective response. Journal of Sport and Exercise Psychology, 19, 278-290.

Treasure, D.C., Monson, J., & Lox, C.L. (1996). Relationship between self-efficacy, wrestling performance, and affect prior to competition. The Sport Psychologist, 10, 73-83.

Tubbs, M.E. (1986) Goal-setting: A meta-analytic examination of the empirical evidence. Journal of Applied Sport Psychology, 71, 474-483.

Vincent, W.J. (1995) Statistics in Kinesiology. Human Kinetics, Champaign, IL.

Walling, M., & Duda, J.L. (1995) Goals and their associations with beliefs about success in and perceptions of the purposes of physical education. Journal of Teaching Physical Education, 14, 140-156.

Weinberg, R.S. (1992) Goal setting and motor performance: A review and critique. In G. Roberts (Ed.), Motivation in sport and exercise (pp. 177-197). Champaign, IL: Human Kinetics.

Weinberg, R.S., & Weigand, D. (1993) Goal setting in sport and exercise: A reaction to Locke. Journal of Sport and Exercise Psychology, 15, 88-96.

Weinberg, R.S., & Weigand, D. (1996) Let the discussions continue: A reaction to Locke's comments of Weinberg and Weigand. Journal of Sport and Exercise Psychology, 18, 89-93.

Weinberg, R.S., Stitcher, T., & Richardson, P. (1994) Effects of a seasonal goal setting program on lacrosse performance. The Sport Psychologist, 8, 166-175.

White, S.A. (1998) Adolescent goal profiles, perceptions of the parent initiated motivational climate and competitive trait anxiety. The Sport Psychologist, 12, 16-28.

White, S.A., & Zellner, S.R. (1996) The relationship between goal orientation, beliefs about the causes of sport success, and trait anxiety among high school, intercollegiate, and recreational sport participants. The Sport Psychologist, 10, 58-72.

Winer, B.J. (1971) Statistical Principles in Experimental Design, 2nd Edition. Kogakusha: McGraw-Hill.

Wrisberg, C.A., & Anshell, M.H. (1989) The Effects of Cognitive Strategies on the Free Throw Shooting Performance of Young Athletes. The Sport Psychologist, 3, 95-104.

Appendicies 1 to 4 not available in this digital copy

Appendix 5

Outline of procedure for goal-setting training and data collection

BASELINE **Data collection 1**	SPSQ (one week prior to competition), CSAI-2 (prior to competition), Handicap (adjusted following competition).
WEEKS 1-5 **Goal-setting training phase 1**	i) General introduction to goal-setting and its application to golf (120mins. lecture). ii) Performance and process-oriented goal-setting training, planning a goal-setting schedule (90mins.workshop). iii) Discussions on individual schedules, reinforcement of assigned goal types, strategies for practice and competitions (2x15mins. individual meetings).
WEEK 23 **Data collection 2**	CSAI-2 (prior to competition), Handicap (adjusted following competition).
WEEKS 24-28 **Goal-setting training phase 2**	i) Evaluation of effectiveness of goal-setting schedules, preperformance routine training, modifications to goal-setting schedules if appropriate (90mins.workshop). ii) Discussions of specific goals and progression towards those goals, reinforcement of specific goal types with reference to primary focus, modifications to schedules (90mins. workshop/small group discussions). iii) Individual meeting to discuss individual goals and strategies to achieve the goals; reinforcement of specific assigned goal types (2x15min.).
WEEK 47 **Goal-setting training phase 3 (recap and review session)**	Individual meeting to discuss goals and evaluation of progression on goal-setting schedule, refinement of goals and schedules where necessary (30mins.).
WEEK 54 **Data collection 3**	CSAI-2 (prior to competition), Handicap (adjusted following competition), SPSQ and social validation questionnaire (one week following competition).

Appendix 6

Summary of data collection and pre-performance routine Intervention

Objectives

1. to develop highly systematic and consistent pre-performance routines for the chipping and putting phases of the client's golf game.
2. to develop and refine routines for fairway iron play and driving strokes

Baseline

Collect data on timing of pre-performance routines (two rounds).

Treatment - Phase One (10 weeks)

Refine routines for chipping and putting.

Data Collection One (12 weeks)

Collect data on timing of pre-performance routines and subjective performance assessments for each stroke (two rounds).

Treatment - Phase Two (13-23 weeks)

Refine routines for approach shots and driving.

Data Collection Two (25 weeks)

Collect data on timing of pre-performance routines and subjective performance assessments for each stroke (two rounds).

Appendix 7

Internal reliability analysis for Task and Ego Orientation in Sport Questionnaire

R E L I A B I L I T Y A N A L Y S I S - task orientation

Reliability Coefficients

N of Cases = 206.0 N of Items = 7

Alpha = .7687

R E L I A B I L I T Y A N A L Y S I S - ego orientation

Reliability Coefficients

N of Cases = 206.0 N of Items = 6

Alpha = .8239

Factor Analysis for Task and Ego Orienattion in Sport Questionnaire

Rotated Component Matrix[a]

	Component	
	1	2
Q4	.820	1.040E-02
Q12	.794	.206
Q6	.759	-9.42E-02
Q10	.711	-9.41E-02
Q8	.648	-4.69E-02
Q2	.635	3.909E-02
Q9	-1.68E-02	.774
Q1	-3.17E-02	.739
Q7	-6.94E-02	.669
Q5	-4.68E-02	.654
Q11	.233	.611
Q13	.145	.592
Q3	-.180	.480

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.