Applied Sport Psychology
A case study report of a self directed cognitive-behavioural intervention programme

Abstract

The present case study was performed to assess the effects of the intervention of a combination of cognitive and behavioural strategies on improving 3000 metre running performance over a 28 day period. A single subject design was utilised and the participant was a 21 year old male recreational runner. Following an assessment of psychological strengths and weakness' a range of strategies were implemented. Goal setting, imagery, relaxation and self talk techniques were all incorporated. Over the four week period there was a significant decrease in 3000m time from the initial 11:11 to 10:52 in the last week. In addition to the performance improvement scales of psychological skills also increased over the intervention period. Particularly imagery ability which increased 8 points on subscale measures and the effectiveness of the relaxation techniques utilised. Post- Intervention performance profiling revealed the most substantial increases occurring in his ability to relax, his pacing ability, goal setting, commitment and concentration.

Introduction, Target identification

My client is a recreational long distance runner wishing to improve his performance. He has completed several half marathons in the past and is currently in training for a similar endurance event in September.

Prior to prescribing any psychological techniques it is important to gauge the athlete's current psychological strengths and weaknesses and identify possible areas which may be assisted by the intervention of psychological skills and techniques. Several exercises were chosen; initially a self analysis interview was conducted in order to highlight past experiences and possible psychological strengths and weaknesses (appendix a). To follow on from this and to ascertain the athlete's current status and identify areas he desires this intervention to improve on, an assessment of what my client felt were important qualities of a good distance runner and the meanings he associated with them was conducted (appendix b). The most important of these were used in the performance profile technique (Butler and Hardy, 1992). Evidence of this

is shown in appendix c. The performance profile technique was also used as an evaluative tool to assess and measure possible improvements post-intervention along the sub-scales identified by the athlete.

As a bench mark for the performance profile my client rated himself on the qualities identified on a one to ten scale to what my client envisaged as his ideal performance state. Following this my client set a level that he would like to reach by the end of the intervention period. This provided the basis on which to set goals.

Due to the short time frame available for this intervention I deem it inappropriate to judge the effects on any psychological intervention strategy on the individual's actual event, the half and full marathon, due to the need of a sufficient number of trials in order to obtain data with which to judge improvement. This is due to risks of overtraining combined with insufficient time to recover from such events. Therefore, I proposed the use of the shorter distance of 3000 metres but with the intention of ensuring the strategies implemented will be relevant and applicable for use in longer distance races. To provide a quantifiably basis to gauge improvement, several base measures of my client 3000m time were recorded prior to initiation the interventions.

Description and Justification of strategies chosen

Goal Setting

The interview and performance profiling identified that compliance to any habitual training regime was not evident and his goal setting skills were low. It was evident though his opinions and thoughts that there is some degree of a negative cycle. In some respects he is unmotivated to race due to his physiological condition and state of

fitness which is well below what he views as his potential performance level but without the focus and deadline of a competition his training succumbs to the pressures of academic work particularly at this time in the final stretch of his degree. It is therefore essential a weekly routine is established and as an additional motive to train, mid-term targets are set in advance of his major event in September. This was done through his commitment to compete is several races in the coming months which were identified.

Three practical sessions were incorporated into his week. Two 3000m runs which will serve as measures for the effects of the psychological techniques to be implemented and one longer distance run each week which will progressively increase week by week. To ensure consistency between the weeks a protocol for the testing was made and can be seen in appendix G

Weekly performance goals for the 3000m run were set. Following the baseline measures of what time he was currently achieving over this distance a five second improvement goal was set to be met by the end of each progressive week. i.e. His baseline time of 11:09, provided a goal of 11:04 for the end of week 1. This goal is hard but realistic and perceived achievable by the client.

Use of Imagery

Pacing

The performance profile highlighted the clients desire to improve upon his pacing skills. To combat this imagery was used. A script was generated to create his perfect 3000m race through visualising himself on a running track my client was familiar

with from an internal perspective (appendix J, 2). Practice from an internal perspective was encouraged over external perspective due to evidence that it create more neuromuscular activity (Hale, 1982; Harris & Robinson, 1986). Through such a method he was able to visualise his position on the track and knowing that 3000m is 7½ laps he was then able to imagine the distance remaining during time trial session (appendix J, 2)

This method was utilised three times a week and also provided an opportunity to incorporate his performance goal for that week. During each session a stop watch would be running and the completion of the laps would correspond to the goal pace. Every practise would see the successful attainment of the week's goal providing a mental experience of the time it takes and pace necessary.

Concentration

Through an analysis of the current cognitive processes during a usual training run and his performance profiling it was found that his level of concentration, particularly in a gym setting easily fluctuated. Current literature over the effects and benefits of associative and disassociate strategies suggest several reoccurring findings from the literature (Masters and Ogles, 1998). Namely, associative cognitive strategies are significantly associated with greater pace and disassociate strategies were related to greater increases in endurance. From my clients personal perspective, he found that at various times in training and competition there was a realisation of poor breathing practices and therefore this could be addressed though a associated strategy aimed at focussing on a smooth, deep breathing pattern throughout his performance.

This problem was addressed using the completion of every lap as a mental reminder to re-centre and check breathing responses. As well as actually performing this in the time trials it was also a central theme of the time trial imagery script (appendix J, 2)

Motivation

It is evident that my client has had many positive experiences through running and these provide an opportunity to aid motivation and prevent possible relapses back into sporadic training. From the initial self analysis interview one of his most positive experiences was the finish of the Nottingham Half Marathon which he competed it last September. Before each of the longer runs scheduled in his training he was instructed to recreate that positive situation using all of his senses. This imagery script is presented in appendix J, 1.

In order to assess any improvement with my client's imagery ability over the intervention period a weekly evaluation was conducted (appendix K). This consisted of a-g subscales measuring his ability to incorporate all his senses, mood, internal and external imagery ability and controllability of the image. These were ranked on a 1- 5 scale (1= no image present to 5=extremely clear image) and a weekly score was calculated through a summation of his subscale ratings.

Use of relaxation techniques

The performance profile identified a low ability to relax and reduce anxiety at key moments. The ability to consciously regulate his responses to certain situations and maintain an optimum level of performance is essential. Through greater awareness of the athlete to learn and identify which mental-emotional and bodily states and feelings accompany superior performances he will be better able to re-enact that state for

subsequent performances. To improve my clients skill in this domain Progressive Relaxation (P.R) was practiced (appendix e) originally developed by Jacobson (1930, 1964). This was incorporated daily, first thing in the morning before practicing the imagery of his goal achievement.

Due to the length of this activity it was deemed inappropriate to also use this to reduce anxiety before the time trials so a 5 to 1 breathing technique was incorporated into his stretching regime before each race. (appendix H). Both of these techniques were monitored for changes by rating pre relaxation technique level of relaxation (-10 = extremely un-relaxed to 10 = extremely relaxed), any immediately following completion of the technique post levels were recorded. This was done separately for the P.R and Breathing (appendix F and I respectively).

Use of Self Talk

During analysis of the clients event it is apparent that this is a solely individual event with no communication with others and depending on the distance covered there is a substantial time in which to think and more significantly for things to go wrong, this heightens the importance of good thought control during actual performance.

During the pre-intervention baseline trial my client was asked to monitor and record any of the self talk that occurred during that time. These are displayed in appendix L. From this analysis of the common self-talk statements that seemed to arise several counter statements were generated in order to combat the negative effect the self talk may be having on performance.

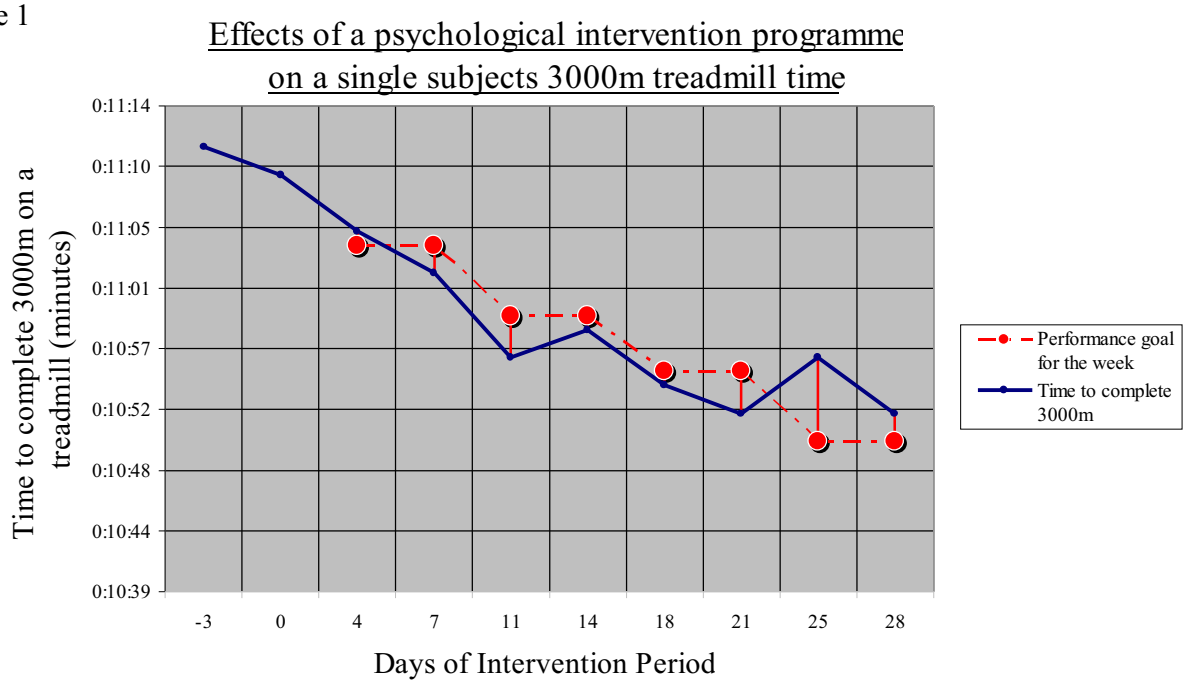
The outline of the intervention period can be seen in appendix D.

Results and back up evidence

Overall Performance

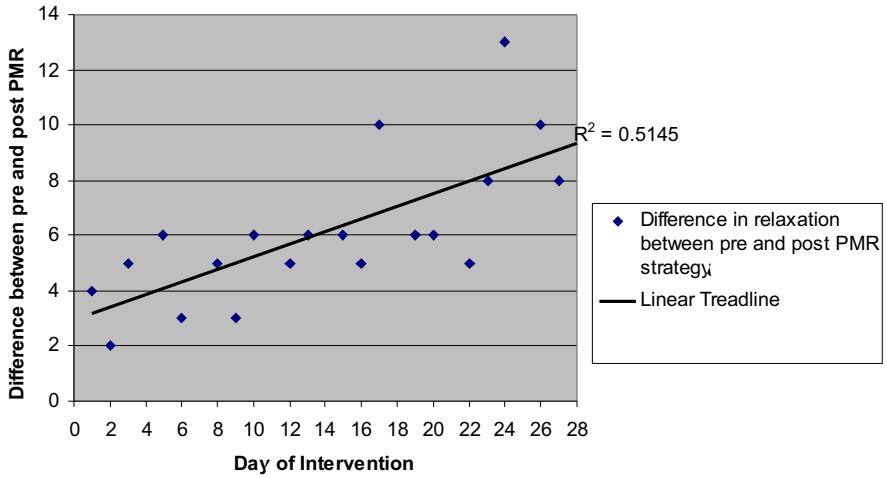
First and foremost the actual performance time to compete the 3000m decreased by 19 seconds over the four week intervention period. The actual performance times

Figure 1



steadily improved through the intervention period and the times closely followed the performance goals set for each week as can be seen in figure 1 above. All the performance goals set were met except for the final week's performance which failed to improve on the previous week's performance and was 6 and 2 seconds off the 10:50 goal set for the week.

Figure 2 **Progressive Muscular Relaxation Effect Evaluation**



Psychological Measures

The overall performance benefit is clearly mirrored by an improvement in the measures of psychological skills which were evaluated over this period. It is evident that the client's ability and awareness of tense muscular states significantly improved as there was an increase in the difference between pre and post levels of relaxation as the intervention period progressed, illustrated in figure 2. The relationship had a significance of $R^2 = 0.5145$.

In addition to the daily P.R measures, there was also a difference evident in the pre-time trial breathing relaxation method (figure 3). The incidence of a falling difference between pre and post measures should not be seen as a failure of effect of the method used. This is due to the absolute level of relaxation upon initiating the time trial significantly increasing (R2=0.7414). It appears that the levels of relaxation coming to the time trial gradually increased thus it was difficult to achieve high differences in affect when the margin for improvement was lower. This may have been caused by a knock on effect of the daily P.R practiced which was possibly able to reduce overall anxiety thus increasing levels of habitual relaxation.

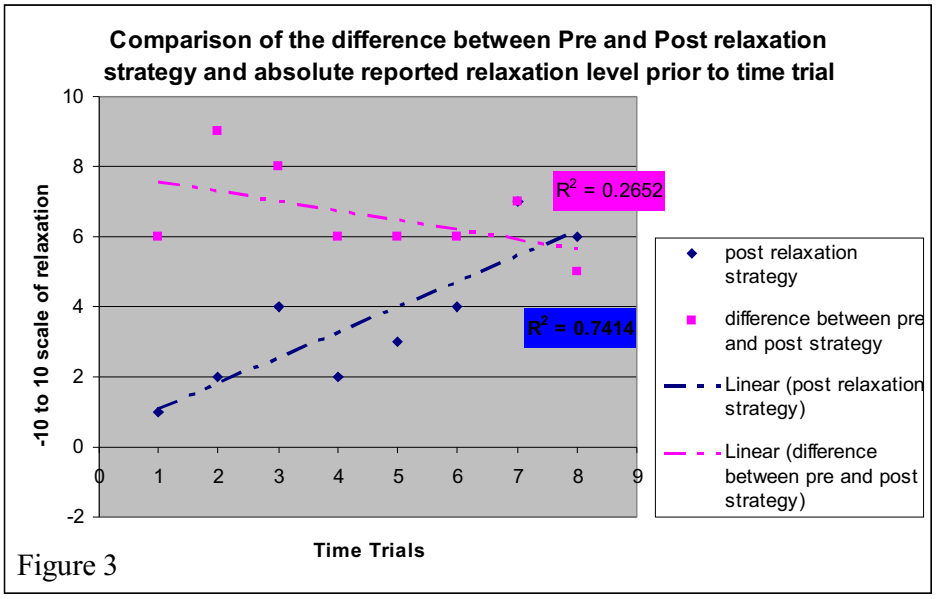
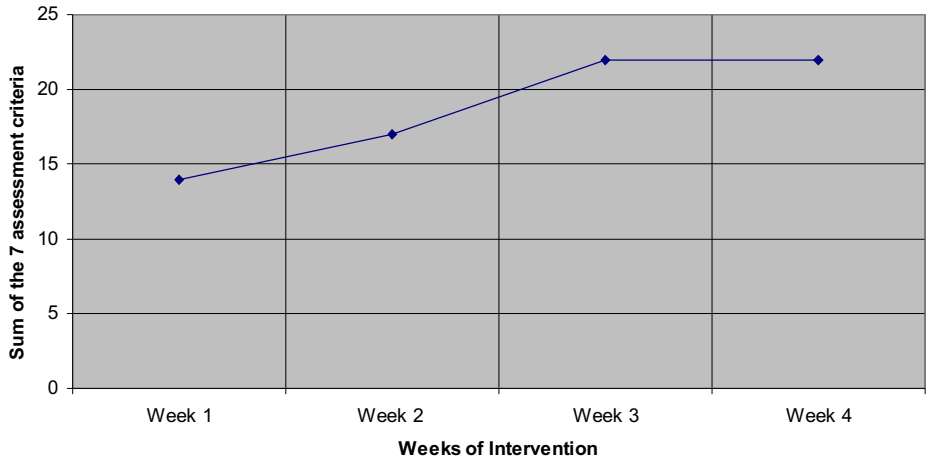


Figure 3

The weekly assessment of imagery ability showed a clear increase in the sum of the seven subscales used in the assessment from the initial score of 14 in week one to 22 in week four (figure 4).

The greatest change in ability seemed to occurring in the first two weeks. Following that time, there is evidence of a plateau in imagery ability although it is difficult to conclude this from only two weekly measures but if the intervention had continued this would probably have been the case.

Figure 4 Assessment of Imagery Abilitiy during the intervention period



Reference to table 1 demonstrates although my client was able to visualise and control an image from an external perspective he found it more difficult to use internal

imagery and his awareness of mood during the sessions were particularly low. These are possible areas which a sport psychological would spend time in developing in future work with the client.

Table 1

Imagery Evaluation Scores					
	Week 1	Week 2	Week 3	Week 4	Total
Ability to See	3	3	4	4	14
Ability to Hear	2	3	3	3	11
Ability to Feel	2	2	3	3	10
Aware of mood	1	1	2	1	4
Internal Perspective	1	2	2	3	8
External Perspective	2	3	4	4	13
Control of image	3	3	4	4	13
Total Score for Week	14	17	22	22	

The post intervention performance profile (appendix c) revealed that the client considered his level in all but 4 of the 18 qualities were advanced to varying degrees following the intervention, most substantial increases occurring in his ability to relax, his pacing ability, goal setting, commitment and concentration.

Summary and critical reflection

The relatively large improvement in performance may be explained by the relatively low level of performance before starting the intervention and the previous lack of psychological skills. These factors provided a greater potential for improvement than if the client was an elite performer.

It is also possible that the improvement in performance time may have a greater association with the changes in physiological status rather than the psychological improvements. In reality however, I consider it is probably a combination of both these factors. This uncertainty may have been reduced through the use of a control which only participated in the physical training and none of the psychological

methods. Although still this does not account for the possible inter-individual differences which are often present in responses to the same psychological interventions.

Ideally several more baseline measures would have revealed any initial physiological improvements or improvements due to greater familiarisation with the event. Ideally only when the baseline measures levelled should the psychological intervention been initiated. This is crucial in determining whether changes that occurred between the baseline and intervention are caused by the actual intervention or would have occurred regardless.

The problem with implementing a package of psychological skills masked which may be having the desired effect and which are ineffective or possible counter productive. It also maybe the case that some of the skills implemented work best in certain combinations and are mutually supportive i.e. goal setting and imagery. In order to ascertain this information a group of individuals would have been needed and interventions with single elements and combinations are necessary to assess their effectiveness.

The use of such group studies does not come without several complications. The single subject design utilised in this study eliminates the potential disadvantage of average affect measures of a group, whereby some may increase; others decrease, while some stay indifferent. Although statistical significant improvements may have occurred in individuals, the average is masked by the group data.

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Appendices Contents