The Effects of a Mental Skills Training Package on Gymnasium Triathlon Performance

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The present study examined the effects of a mental skills training package on gymnasium triathlon performance. Five participants took part in a single-subject multiple baseline across individuals design, which was used to evaluate an intervention package including goal setting, relaxation, imagery, and self-talk. The results of the study indicated the mental skills package to be effective in enhancing triathlon performance for all five participants. Additionally, all participants increased their usage of mental skills from baseline to intervention phases. Follow-up social validation checks indicated all participants to have perceived the intervention to be successful and enjoyable, and all were satisfied with delivery and content of the package. In conclusion, the findings provide further evidence to suggest mental skills training packages to be effective for endurance performance.

One major aspect of mental skills training that has received considerable attention in recent years is the effect of mental skills training packages on performance. Studies (e.g., Kendall, Hrycaiko, Martin, & Kendall, 1990; Lerner, Ostrow, Yura, & Etzel, 1996; Patrick & Hrycaiko, 1998) suggest mental skills training is an effective intervention for the enhancement of athletic performance. It has also been concluded by Greenspan and Feltz (1989) that educational relaxation-based interventions and basic cognitive restructuring techniques are most effective in improving collegiate and adult athletes’ performance in competitive situations. Despite what appears to be considerable support for the use of mental skills train-

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ing packages, there have been calls (e.g., Weinberg & Gould, 1999; Weinberg & Williams, 1993) for more controlled studies before more definitive conclusions can be made.

Much of the early research utilizing prescriptive mental skills packages did so using individual mental skills. Of late, however, it appears more effective to employ a combination of mental skills within a package. In acknowledging this, several single-subject studies have been initiated to assess the impact of mental skill training packages on selected sport specific skills (Kendall et al., 1990; Swain & Jones, 1995), closed skill performance (Lerner et al., 1996; Shambrook & Bull, 1996), and sports requiring muscular power (Wanlin, Hrycaiko, Martin, & Mahon, 1997).

In addition, Patrick and Hrycaiko (1998) examined the effects of a mental skills training package on the endurance performance of four runners. Via utilization of a single-subject multiple baseline across individuals design, the results indicated that the package, which consisted of relaxation, imagery, self-talk, and goal setting, enhanced 1,600m running performance. Although Patrick and Hrycaiko (1998) reported mental skills packages to be advantageous for performance, future research is required to inform athletes, coaches, and practitioners of the potential benefits of such packages for competition (Wanlin et al., 1997).

Although there is evidence suggesting mental skills packages are advantageous for sporting performance, as yet, no research has indicated as to the combination of skills that are required for endurance performance. Despite researchers (e.g., Burhans, Richman, & Bergey, 1988; Bull, 1989) suggesting that endurance activity can be enhanced by utilizing mental imagery, self-talk, and relaxation strategies, no rationale for the choice of skills has been forwarded.

Intuitively, it could be suggested that for each mental skill to be included within a package, a rationale for its inclusion is necessary. The first mental skill commonly included within previous “package” research includes that of relaxation. Although Bull (1989) found support for the use of relaxation strategies for the ultradistance runner, it was not made clear as to what the benefits were. Many endurance performers report the need to continually be able to focus on bodily feelings such as muscle tension and breathing patterns. Introducing relaxation strategies to the performers may enable them to focus on task relevant thoughts in their attempt to complete the endurance event. Similarly, relaxation strategies may enable performers to become fully prepared for their presentation, and during their appearance, they would have a strategy whereby they are able to maintain their optimal relaxation state despite the potentially conflicting cognitions and feelings of pain (Bull, Albinson, & Shambrook, 1996).

Another skill often integrated into a mental skills package is that of mental imagery. Researchers (e.g., Bull, 1989; Patrick & Hrycaiko, 1998) have suggested that mental imagery may be beneficial to endurance performance. With the exact reason for this conclusion yet to be forwarded, it would appear that imagery may be beneficial to performers when they become tired. More specifically, they may utilize imagery to see themselves completing the event, or seeing their muscles working to counter the build up of lactic acid, thus acting as a motivational construct. Although dated, previous research (e.g., Suinn, 1977; Weinberg, Seabourne, & Jackson, 1981) has reported that imagery when combined with relaxation strategies is more effective than imagery alone. Performers, therefore, may require the use of relaxation prior to an event to imagine themselves successfully completing the course or seeing their process goals working effectively.
A third mental skill typically included in mental skills package interventions is that of self-talk. Research has demonstrated that self-talk can have positive effects for improving performance in cross-country skiing (Rushall, Hall, Roux, Sasseville, & Rushall, 1988) and rowing (Rushall, 1984), which can both be classed as endurance events. Similarly, Bull (1989) and Patrick and Hrycaiko (1998) included self-talk in the intervention package for the ultradistance runner and endurance performance, respectively. The rationale for the use of self-talk within an intervention package for endurance performance can be three-fold. First, the use of positive self-statements allows for negative statements to be countered; second, self-talk can be combined with imagery in that it allows for focus on correct cues; and third, self-talk allows for appropriate focus on goals that have been set (Kendall et al., 1990; Sellars, 1997). Furthermore, self-talk can be utilized both prior to and during presentations to enable the performer to be in the appropriate “frame of mind.”

A fourth mental skill, which may warrant inclusion within a mental skills package, is that of goal setting. While Patrick and Hrycaiko (1998) employed goal setting within their study, no rationale was provided. Intuitively, the use of goal setting may allow two benefits for the endurance performer. First, improved goal-setting techniques may enable enhanced feelings and perceptions of control. Indeed, contemporary research within the area of sport psychology has focussed on goal-setting strategies. Moreover, it has been suggested that effective goal-setting strategies include a combination of process, performance, and outcome goals (e.g., Filby, Maynard, & Graydon, 1999; Kingston & Hardy, 1997) in sporting settings, which may also allow for a combination of mastery and ego goal perspectives. Indeed, the adoption of multiple goal-setting strategies is suggested to benefit the performers by enabling them to have feedback mechanisms throughout the event rather than a sole reliance upon outcome measures. For example, during a program, performers are able to focus on progress goals, which allow for attention to be directed to the task in hand rather than onto uncontrollable outcome performance measures.

While empirical investigations continue to examine the goal types that are best suited to enhance sporting performance, practitioners have also forwarded the notion that goal setting includes a motivational element for both competition and training. In particular, practitioners have focussed on setting smarter goals, which are specific, measurable, attainable, realistic, time phased, exciting, and recorded (Locke & Latham, 1985, 1990; Locke, Shaw, Saari, & Latham, 1981). Such a notion allows for the performer to become involved in the goal-setting process, subsequently increasing motivation to achieve the goals, while having a knowledge as to exactly what their goal is, be it an outcome, performance, or process goal, or a combination of goal-setting strategies. Despite the inclusion of goal setting in their intervention package, Patrick and Hrycaiko (1998) did not attempt to set process goals or combined goals. Instead, the performers were requested to set long-term performance outcome goals and then daily performance goals. Therefore, it may have been advantageous for the participants to set process goals to focus on in addition to the daily performance goals. Consequently, it would seem reasonable to suggest that goal-setting techniques are a fundamental requirement within a mental skill package to allow for enhanced feelings of control and increased motivation for the task.

Despite the mental skills having relatively little empirical evidence for their inclusion in the intervention package for endurance performance, further research
is required to establish what skills are necessary and how they should be utilized. There were four main aims to the study. The first aim was to examine how well a mental skills training package, which combined goal setting, relaxation, imagery, and self-talk, enhanced gymnasiuim triathlon performance. A second purpose of the study was to further extend the use of mental skill packages and their influence upon subsequent endurance performance as opposed to the more traditional method of employing single mental skill interventions. A third aim of the study was to extend the study of sport endurance performance to the gymnasiuum triathlon. A fourth and final purpose of the present study was to develop further the applied sport psychology literature by employing an idiographic single-subject research method as opposed to the more traditional nomothetic group design.

**Method**

**Participants**

The participants were five male members of a local gymnasiuim located in the south of England (mean age 24.2 ± 4.56 years, range = 20-32 years). Each of the five participants were recreational athletes who occasionally competed in local road running competitions. None of the athletes had actually participated in a full competitive triathlon event. They regularly completed a gymnasiuim triathlon, organized by the local gymnasiuim, whereby members are able to “try out” for their best time and subsequently monitor improvements via completion times. While the participants reported having a knowledge of sport psychology and the potential benefit of using mental skills, none of the participants had experience using mental skills training packages in a systematic manner. Furthermore, the participants reported that although they utilized what they considered to be mental skills during the gymnasiuim triathlon, they had not experienced a structured mental skills training program.

**Experimental Design**

A single-subject design, the multiple baseline across individuals (Kratochwill, 1978; Martin & Pear, 1996), was used to examine the effects of a mental skills training package on participants’ gymnasiuim triathlon times. Bryan (1987) and more recently Hrycaiko and Martin (1996) have advocated such a research approach in sport psychology. The intervention was introduced sequentially on a predetermined week to all five participants, which allowed for the staggering of the intervention (i.e., Participant 1 received the intervention between Weeks 3 and 4, Participant 2 received the intervention between Weeks 4 and 5, etc.). In the weeks preceding the delivery of the intervention, participants were instructed to complete the gymnasiuim triathlon as though they would normally.

**Task**

Traditionally, triathlon races are competitive events whereby performers coact in striving to achieve successful performance. The present study utilizes a gymnasiuim triathlon, which is completed by gymnasiuim members in an attempt to monitor fitness in terms of time taken to complete the task. Although the participants did not compete at the same time (thus casting doubts over the ecological validity of
any subsequent findings), competitive conditions were created via the introduction of an incentive. Specifically, participants were informed that the fastest time on any one trial would win a prize. Incentive to win the prize offered was measured by asking the question, “How much of your motivation to compete in this experiment is governed by the chance to win the prize offered?” The participants had to respond on a 9-point Likert-type scale, where 1 = not at all motivated and 9 = very much motivated (Greenlees, Graydon, & Maynard, 1999). A second Likert-type scale question was asked following each time trial as to what level of exertion the participant exerted for each trial, where 1 = very little exertion and 9 = maximal exertion.

**Dependent Variables**

The main dependent variable within the study was that of the total time to complete the gymnasium triathlon. All participants completed the stages of the triathlon in the same order on every trial, these being rowing, cycling, and finally, running. Participants were informed that the time to move between equipment for the differing activities would be included in the total triathlon completion time. Following the completion of each gymnasium triathlon time trial, performers were provided feedback on their performance to enable them to monitor their progression throughout the ten-week testing period. Additionally, a “Mental Skills Assessment Questionnaire,” used by Patrick and Hrycaiko (1998, p. 297), was administered following the completion of each gymnasium triathlon performance. Slight modifications were made to the questionnaire in that the word “run” (as used by Patrick & Hrycaiko, 1998) was replaced with “performance.” The questions asked whether the participants set goals prior to and/or during each performance, whether they performed a relaxation technique before and/or during each performance, whether they employed imagery strategies before and/or during the performance, and whether they utilized positive self-talk statements before and/or during performance. The questionnaire was employed in an attempt to assess the use of mental skills prior to and during each triathlon performance. As yet, there are no reliability or validity measures for the questionnaire, and at present, it is used as a checklist procedure.

**Treatment: A Mental Skills Training Package**

The mental skills training package consisted of goal setting, relaxation, imagery, and self-talk. Each of the intervention components was introduced via a series of workbook exercises with accompanying exercises for follow-up work after the initial delivery session.

The first mental skill was that of goal setting, where long and short-term goals were discussed. The participants were encouraged to provide examples of each type so that reinforcement or correction from the experimenter could take place. At this stage, the participants were informed as to the benefits of setting “smarter” goals (Locke & Latham, 1985, 1990; Locke et al., 1981). Having achieved an understanding of long and short-term goals and how to set smarter goals, and in keeping with recent research (Filby et al., 1999), the participants were educated on the use of outcome, performance, and process goals (Burton, 1989; Hardy, Jones, & Gould, 1996) and the importance of maintaining a balance between the three types of goals. To enable participants to achieve effective goal setting, the workbook
provided information that reinforced the material discussed in the session in addition to allowing the participants to carry out goal-setting exercises.

The second mental skill was that of relaxation, which was delivered in a three-stage approach. The first stage enabled the participant to feel what it is like to relax, using Progressive Muscle Relaxation (PMR; Jacobson, 1938). The second stage was that of centering as described by Hardy and Fazey (1990), which was used when the participants are stretching and getting ready for the performance. This technique is a relaxation strategy that requires participants to change their center of consciousness from their head to their center of gravity (a point just below the naval). Centering provides a mechanism for quick and effective relaxation while focusing attention on what needs to be done and how it is going to be achieved (Hardy & Fazey, 1990). The final stage of the approach was to enable participants to relax during performance. This stage employed breathing strategies as outlined by Hogg (1995) where the participant is able to monitor breathing and tension levels. To enable learning each skill, participants were requested to monitor their tension levels prior to and following the relaxation session by responding to a series of bipolar descriptors on a scale from 0 (very tense) to 10 (very relaxed). Employing such strategies allows the participants to develop their understanding and self-awareness of their tension levels (Bull et al., 1996).

The third mental skill was that of imagery. The session was designed and based on research within sport psychology and included internal and external imagery (Murphy, 1994), differing temporal aspects, whereby the participants were encouraged to image in real time and slow motion (Andre & Means, 1986), vividness and controllability (Murphy & Jowdy, 1992), images of competition mastery (Moritz, Hall, Martin, & Vadocz, 1996), physical simulation (Meacci & Price, 1985) and successful execution of skills (Paivio, 1985). The workbook covered all material discussed with additional exercises to supplement the session with the examples of how to use imagery being provided as outlined by Hale (1998). More specifically, each participant was encouraged to develop a competition-specific imagery script, which encompassed all previously mentioned aspects of imagery. Participants were instructed to record imagery sessions on a series of Likert scales for timing (where 0 = out of time and 10 = perfect timing), vividness (where 0 = blurred and 10 = totally vivid), controllability (where 0 = uncontrollable and 10 = totally controllable), and physical simulation (where 0 = could not feel anything and 10 = felt all movements).

The final mental skill was that of self-talk. This was employed via a two-stage approach. The first involved the construction and use of appropriate positive self-talk, via use of key words and competition affirmations. All participants listed positive self-statements that would be of benefit to them either before or during a competition. The second stage consisted of being able to control negative self-statements and then reconstructing them in a positive manner (Hamilton & Fremouw, 1985; Maynard, Smith, & Warwick-Evans, 1995). The second stage was also conducive to the participants being able to use the negative thought to trigger a reactive strategy (Hanton & Jones, 1999). There were three components to this routine: breath (relax), talk (regroup/refix), and play (Maynard, 1998). Participants were encouraged to work through all components of the workbook, which attempted to consolidate the material discussed in the session.
Intervention Procedure

Initial contact was made with the participants on a volunteer basis, where a notice was placed in the gymnasium asking members (both male and female) to enroll to participate in a sport psychology research project. A total of five gymnasium members forwarded their names and all were subsequently invited to participate in the study. Participants attended individual conditioning training sessions for an average of three occasions per week prior to the study. For all participants, one of the training sessions included completing a gymnasium triathlon, which includes rowing for 2,000m on a Concept II Indoor Rower, cycling for 5,000m on a Powersport Evolution Cycle Ergometer and running for 3,000m on a Powerjog J Series Running Ergometer, where they attempted to achieve a personal best. The remaining training sessions included general aerobic (including rowing, stepping, running, and cycling) and anaerobic maintenance training (general weight training). Despite no specific measures being taken as to how well conditioned the participants were prior to the study, attendance to conditioning training sessions was monitored, with all participants attending a minimum of three sessions per week. Furthermore, participants were requested to ensure that all conditioning sessions during the testing period were similar to those prior to the study. The reason for this was that similar training loads pre and during the testing period would reduce the potential for improved conditioning being a determinant for improved gymnasium triathlon times. Similarly, the participants were asked not to complete the time trial triathlon during the testing period unless it was for the purposes of the study. All participants were informed of the nature and extent of the investigation, and all gave their consent to participate.

While the participants did not actually complete each time trial at the same time, the time trials began in the same week. Each participant completed their time trials exactly one week after each other throughout the testing period. Having previously determined that each participant would receive the intervention on a staggered weekly basis, participant one received the intervention between weeks three and four. When each participant’s turn came to receive the intervention, it was administered over a four-day period. On the first day, goal setting was covered; on the second day, relaxation skills were introduced; on the third day, imagery skills were administered; finally, on the fourth day, self-talk skills were taught. Each of the sessions was conducted at the gymnasium center during off-peak times and lasted for a maximum of one hour. Each participant met with the experimenter on the four consecutive days at the same time of day. The experimenter worked through a series of workbook exercises with each participant at each meeting to enable enhanced learning (Patrick & Hrycaiko, 1998). Following completion of intervention delivery, the participants were informed that they should contact the experimenter should there be any further questions with regard to the content of the intervention and exercises in the workbooks.

Treatment of Data

The raw performance score data obtained from the participants was plotted according to how long it took each participant to complete the triathlon (in seconds). The scores from the mental skills questionnaire were plotted according to whether they used the skills or not. In accord with the recommendations forwarded by
Martin and Pear (1996), the researcher used visual inspection of the data and the following criteria to establish the occurrence of any experimental effects: (a) the number of overlapping data points between the pre-intervention and post-intervention phases, where fewer overlaps suggest stronger experimental effects from pre- to post-intervention; (b) the immediacy that an effect was observed following intervention; (c) the size of an effect after intervention, which indicates whether the intervention improved performance considerably or only slightly; (d) when baseline performance is stable or in the direction opposite to that predicted for the effects of the treatment; (e) the number of times that effects were replicated across the participants, where increased consistency indicates a generalized pattern of the experimental effects.

Social Validation

Following completion of the study, a social validation questionnaire was administered to the participants. Many intervention researchers have called for social validation to assess participant reactions to treatment procedures and experimental outcomes (Kazdin, 1982; Kendall et al., 1990; Pates, Maynard, & Westbury, in press). The questionnaire was designed to provide information concerning the importance of the study and the effectiveness of the intervention. Specifically, participants were asked the following questions: (a) “How important is an improvement in performance to you?” with responses ranging from 1 (not at all important) to 7 (extremely important); (b) “Do you consider the changes in performance to be significant?” with responses ranging from 1 (not at all significant) to 7 (extremely significant); (c) “How satisfied were you with the mental skills training program?” with responses ranging from 1 (not at all satisfied) to 7 (extremely satisfied); (d) “Has the intervention proved useful to you?” with responses ranging from 1 (not at all useful) to 7 (extremely useful). In an attempt to elicit information regarding the precise impact of the intervention, participants were also asked to consider potential underlying reasons as to why the intervention procedure was a success or failure. This was assessed via an open-ended question, which read, “If from your perceptions, the procedure has contributed to enhancing/hindering your performance, can you state why you perceive this to be the case?”

Results

Incentive to Win and Physical Exertion

The results of the question regarding the incentive to win suggested that the five participants were very much motivated to win the prize (mean score of 7.80 ± 1.30). The second question given to the performers with reference to level of exertion put forth for each trial showed all mean scores for the five participants to be greater than 7.6, suggesting that on all occasions, participants were wielding maximal or near maximal exertion.

Procedural Reliability Evaluations

All participants completed the exercises within each of the mental skills workbooks. A trained assistant verified that all aspects of the behavioral checklist were applied consistently and correctly to each participant by recording when a new
mental skill was introduced and what activities were completed in the work- 
book. Additionally, a qualified gymnasium instructor was made aware of the 
purposes of the study and verified the triathlon times for each participant's 
ten trials.

**Intervention Effects**

The results of the competition gymnasium triathlon performance data for each 
participant are presented in Figure 1. The mental skills usage across baseline and 
interventions can be seen for each participant in Figure 2. For all five participants, 
the triathlon performance time can be seen to have improved during the intervention 
phase, with Participant 1 showing the greatest difference from baseline to 
intervention.

Upon receiving the intervention, Participant 1 experienced an immediate 
effect. However, the first triathlon time postintervention overlapped with one time 
during the baseline phase. Overall, Participant 1 demonstrated a 68 sec decrease in 
time to complete the gymnasium triathlon throughout the intervention phase when 
compared to the baseline phase. Additionally, Participant 1 showed a significant 
increase in usage of mental skills throughout the intervention in contrast to the 
baseline.

Participant 2 also showed an immediate effect in time to complete the triathlon 
when introduced to the intervention. When in the intervention phase, Participant 
2’s average times decreased by 30 secs compared to the baseline phase. Furthermore, Participant 2 demonstrated an increase in usage of mental skills from 53% 
to 97% during the intervention phase.

Participant 3 also demonstrated an immediate effect after the introduction of 
the intervention. Although there were two data points in the intervention phase 
that overlapped with a data point from baseline, the baseline data point was the 
fastest time during baseline. Overall, Participant 3 showed a 16 sec increase in 
performance times from baseline to intervention. The usage of mental skills also 
increased 52% from baseline to intervention for Participant 3.

Following the introduction of the intervention, Participant 4 showed an im-
mediate effect with performance time being significantly faster. Overall, there was 
a 20 sec decrease in time to complete the triathlon from baseline to intervention. 
There was, however, one overlapping data point in the intervention phase. Particip-
ant 4’s usage of mental skills also increased from a 43.7% average during baseline 
to 100% throughout the whole of the intervention phase.

Finally, Participant 5 demonstrated an immediate effect following intro-
duction of the intervention. There were no overlapping data points and an average 
increase of 29 secs was witnessed from baseline to intervention phase. Addition-
ally, there was an average increase of 62.9% for use of mental skills from baseline 
to intervention phases.

**Social Validation**

The results of the social validation questionnaire indicated that all five participants 
perceived themselves to have improved significantly in their triathlon performance. 
Additionally, they all indicated that they were satisfied with the delivery and con-
tent of the intervention, suggesting that the intervention was useful and that they 
would proceed with mental training for competitive performance.
Figure 1 — Time taken for each participant to complete the gymnasium triathlon during the baseline and intervention phase.
Figure 2 — Mental skills usage before and during triathlon time trials for baseline and intervention phases.
Discussion

The results of the present study indicated that the mental skills training package consisting of goal setting, relaxation, imagery, and self-talk enhanced gymnasmium triathlon performance. The overall evaluation demonstrates that all participants improved performance times following the introduction of the intervention. Similarly, all participants’ usage of mental skills increased considerably from the baseline to intervention phase. Additionally, while the assessment procedure in the present study failed to examine real-life competition, some extension of the endurance performance literature (from running) to triathlon has been made. Future research is therefore required to replicate the study but with the assessment comprising actual competitive triathlon performance.

A second aim of the study was to evaluate a mental skill package on performance. Having received a mental skills package, the results revealed that the participants were able to utilize a variety of strategies prior to and during performance. Such a finding suggests that the “package approach” positively influenced performance and further suggests that research is required to examine the efficacy of mental skills packages as compared to the more traditional method of employing a single mental skill intervention. As discussed previously, researchers have advocated that mental skills should be combined with each other (e.g., Kendall et al., 1990; Lerner et al., 1996; Patrick & Hrycaiko, 1998). However, future research appears warranted to elicit how performers interchange from one mental skill to another. Specifically, researchers need to examine how a combination of mental skills may benefit each other to enhance athletic performance.

The results of the study also add further support to the evidence suggesting that mental skills packages can be beneficial for endurance events. Indeed, Bull (1989) reported that for ultra-distance runners, a mental skills package including relaxation, self-talk, and imagery was beneficial. Furthermore, and more recently, Patrick and Hrycaiko (1998) observed improved 1,600m performance following the introduction of a package including the same strategies as utilized in the present study. More importantly, though, research is required whereby the performers are actually engaged in competition (Kendall et al., 1990; Wanlin et al., 1997). Furthermore, the utilization of a competitive environment would allow the mental skill package to be examined while participants race against each other. In acknowledging that the performers raced individually within the present study, it may be that performers’ anxiety levels or other mental states were not affected because they were not able to view their competitors. It could also be argued that despite an incentive being offered in the present study, real-life competition may invoke differing mental states than those invoked when competing for an experiment.

A weakness of the present study was the use of a gymnasmium triathlon, which lacked ecological validity. Despite this, all participants were striving for their fastest times in anticipation of winning a prize (as measured by the Likert-type scale question). Although competing individually, all participants reported exerting maximal or near maximal effort on each competitive trial. Indeed, this can be reflected in the improvements in performance shown in Figure 1. While performers, coaches, and sport psychologists alike view performance improvements from utilizing mental skills in training as critical, it is only when performance improvements in competition are witnessed that mental skills training can be viewed with greater credibility (Patrick & Hrycaiko, 1998; Weinberg & Comar, 1994). In
response to such claims, future research is required to demonstrate the benefits of psychological skills training on competitive athletic performance. Furthermore, such future research may wish to continue the trend of adopting more idiographic methods of data analysis whereby researchers are able to identify the experimental effects on each participant within the study.

Although qualitative information was not reported within the results section, brief discussions with the performers following each triathlon time trial added weight to some of the quantitative findings. More specifically, Participant 2 experienced his worst performance during the intervention phase on Triathlon 9. The comments by the participant following the triathlon indicated that he had an excessive workload at that time, which suggests that other factors (e.g., those unrelated to the triathlon) were detrimental to the performance. Interestingly, while having an immediate effect following the introduction of the intervention, Participant 1’s performances gradually improved. This coincided with a gradual increase in the usage of mental skills, which suggests further that the usage of the mental skills influenced performance enhancement.

Unfortunately, follow-up testing was not possible due to the rigid time demands placed on the participants. Such testing would have allowed further examination of potential performance improvement over time and equally as important, whether the adherence to the usage of mental skills was maintained (Shambrook & Bull, 1999). Indeed, this needs to be addressed with some urgency within future research. Despite the aim of the study being to assess the performance changes following a mental skills package, future research is required to establish whether certain mental skills are more advantageous than others. This may shed light on whether there needs to be a specific ordering of mental skills when placed in a package for an intervention. Initially this may appear counter to the rationale for using a package approach, however, some mental skills may have beneficial effects earlier and therefore may warrant delivery prior to other skills.

To conclude, the present study demonstrated that a mental skills training package combining goal setting, relaxation, imagery, and self-talk was beneficial in enhancing gymnastics triathlon performance. Despite using a laboratory test as the dependent variable, the notion of competition was introduced via an incentive. Therefore, future research needs to examine the efficacy of mental skill packages on ultra-endurance competitive events in a real-life, ecologically valid setting. The results also provide further support for the use of mental skills packages as compared to single skill interventions in addition to extending the use of single-subject research designs to monitor the effects of intervention programs on competitive performance.

References


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