

Case study: A mental coaching program for a high jumper

Anu Nässi

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<p>Author or authors Anu Nässi</p>	<p>Group or year of entry DP 7</p>
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<p>Teacher/s or supervisor/s Markus Arvaja</p>	
<p>The main focus of the thesis is based around a psychological skills training program which was introduced to a nationally ranked Finnish high jumper. The case study explores the process of designing this program and its impact on the competition results of this particular athlete. The goal was that the intervention would positively affect performance preparation and thus improve competition results.</p> <p>Previous research in this field suggests that the use of well structured psychological skills training programs and interventions result in better performance results. In addition, almost all elite athletes use some kind of mental training exercises. This suggests that psychological skills training is a key element to achieving success at the top level.</p> <p>The thesis covers the steps leading up to the implementation of this psychological skills training program and clearly describes the overall process. Data was collected both before and after the program in the form of competition results. The pre-intervention results were then compared with the post-intervention results to determine the impact of the program.</p> <p>The results suggest that the athlete's competitiveness did in fact improve as a result of the psychological skills training program. In addition, due to the athlete's feedback, the program was considered to be a success.</p>	
<p>Keywords Mental coaching, high jump, psychological skills training</p>	

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1 Introduction

In short, this thesis is a description of the process of designing and implementing a mental coaching program for a high jumper in Finland. Originally the idea for this thesis came from a class assignment in which we were asked to practice mental coaching by designing a program for an individual or a group. It was very easy for me to find a subject for my project as one of my closest friends is a high jumper. All I had to do was simply mention the assignment and she was onboard asking if I could design a mental coaching program for her. From this point on, everything appeared to fall into place as I realized I could expand this project to a much larger scale and use it for my thesis.

First, the high jumper in question is Laura Rautanen who was competing at the top level of the U23 age group in Finland, but had had little success at the very top level in Finland. I wanted to have a look at why the success at the junior level wasn't transferring over to the senior level competitions and explore ways to change this. She was very enthusiastic and open-minded which aided the overall process.

Before starting my investigations on this matter, I was sure to get the approval to do this from both her coach and Vilppulan Veikot, the athletics club which she represents. Both parties were pleased to hear about this endeavour and offered me their full support and assistance. The club was very generous to offer some financial assistance by means of covering some travel costs which made it possible for me to travel all over Finland to watch many of the competitions; something which was an important part of the process.

Ultimately the goal of this case study was to create a psychological skills training program that would better prepare the high jumper for specific competitions. The success of the program was measured by comparing the results of the 2009 season with the results of the 2010 season; with special focus on the Elite Games League competitions and the outdoor Finnish Championships.

The thesis is structured in a manner that will hopefully provide a clear depiction of how the psychological skills training (PST) program for this high jumper was planned and implemented. The theory section should provide sufficient information to understand not only the PST program and the mental skills used, but also the sport of high jump. Then in the methods chapter, I try to provide a complete picture of how the planning phases and implementation of the program happened and why certain actions were taken. I did not want to go into all the specific details of everything that happened as I felt that would take away from the complete picture and purpose of this case study. The results are then presented in a manner to simply demonstrate with quantitative data whether or not improvements occurred and some qualitative results were given to provide a more holistic critique of the program from the view of the athlete. Finally, these results are discussed in the final chapter in a means to try and examine their validity and implications.

2 Basics of High Jump

To fully comprehend the task, it appears to be only natural to cover both the theory of sports psychology related to this case study and to explore the sport at hand, which is high jump. This chapter will explore both the psychological, technical, tactical and physiological requirements of high jump. In addition, the chapter will start with an overview of the rules and processes of a typical competition.

2.1 Competition rules and procedures

The aim of the high jump event is fairly simple, it is to clear the crossbar from the greatest height. On the part of the athlete, a competition can be broken down into four parts, general warm-up, sport-specific warm-up, competition and cool down (Rautanen, 2009). The general warm-up and the cool-down are typically done individually outside the competition area. The other two parts take place in the competition area under the supervision of up to four on-site judges (IAAF 2010).

The competition area is shown below in figure 1. The runway has to be at least 15 meters long and the length of the crossbar is 4 meters; it is supported by two upright posts (Rosenbaum 2011b). The minimum measurements for the landing area are 5 meters long by 3 meters wide (IAAF 2010, 171).

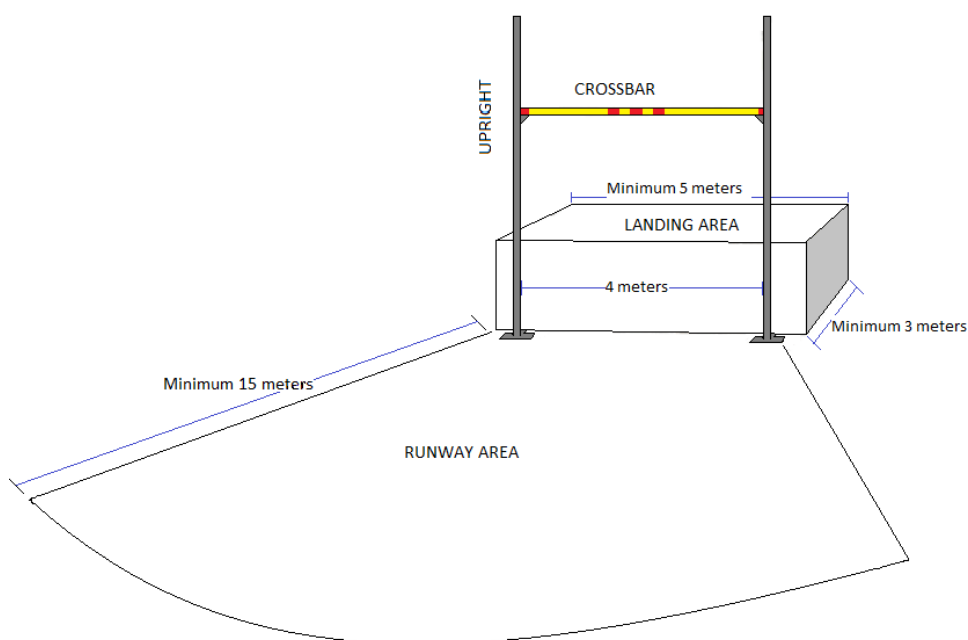


Figure 1. The high jump area-layout

Both the sport-specific warm-up and the competition take place in a competition area described above. Prior to the start of the actual competition, the sport-specific warm-up takes place, during which athletes are allowed to take several practice jumps and put up to two markers on the runway (IAAF 2010, 161; Rosenbaum 2011b). These markers are used as visual guides during the approach run (IAAF 2010, 161). Following this, the competition begins with the crossbar set to a fairly low, predetermined height for the first round (Rosenbaum 2011a). Competitors may begin at this height, or they may choose to start at a later height (Rosenbaum 2011b). A successful jump is one in which the take-off was done with one foot and the crossbar remains on the uprights when the jumper has left the landing area (IAAF 2010, 169). A competitor is eliminated from the competition when they have failed to clear the crossbar in three consecutive jumps at either the same height or a combination of heights (Rosenbaum 2011b). First place is awarded to the athlete whom has cleared the greatest height during the competition. In the event of a tie, there are several tie-breakers: the fewest misses at the tie-height; or the fewest misses throughout the competition (Rosenbaum 2011b). Should there still be a tie, a jump-off occurs, which resembles a sudden-death penalty shoot-out in football, they each get one attempt at different heights, the moment one clears it and the other fails the competition ends. (Rosenbaum 2011b). Overall, the procedures and rules of a high jump competition are fairly simple and straightforward.

2.2 Technical and tactical preparation and needs

The sport of high jump, like other sports, has both technical and tactical aspects to the sport. Due to the nature of the sport, the technical requirements tend to outweigh the tactical side. Tactical preparation refers to the development of a competition strategy, which includes gathering strategic knowledge. Technical preparation refers to effectively acquiring the skills needed for optimal performance. (Blumenstein et al. 2007, 10-11.)

The tactical aspect of high jump is very straightforward due to the nature of the sport. It is an individual sport in which the competitors cannot directly influence the athlete's performance as everyone has their own timeframe and space to perform. Therefore, tactically the aim is to jump over the bar every single time. However, towards the end

of some competitions several tactical options may arise when the opponent clears a height on an earlier attempt. In this situation, the remaining attempts will be used for the next height rather than current height. This is done because it keeps the athlete in competition for the medals. (Wallinheimo, 21.3.2011.)

The technical requirements are much more important and complex than the tactical needs. The execution of a jump can be broken down into three different phases: approach or run-up, take-off and flight (Jacoby & Farely, 3). Possibly the most important and technically challenging phase is the approach phase. An effective approach includes proper speed, the correct angular momentum and the correct hip height. It is the curved path of the run that causes many technical challenges; this is why up to 90% of the technical focuses on the run-up technique. While the flight phase is an important part of the execution, the actual flight path is set the moment the athlete leaves the ground. The next phase is the take-off phase, when the switch from horizontal movement to vertical movement occurs. From a technical perspective, it is important that the body posture is aligned correctly, and that the jumper rotates forward and laterally because this rotation causes the body to propel over the bar. Finally, in the flight phase the athlete follows the flight path set by the approach and take-off. During this phase the body is rotated and the back is arched. The execution of the jump ends when the athlete lands on the landing mat. (Jacoby & Farley, 89-91.)

The aim of perfecting the technical skills is to transfer hip movement from a horizontal direction to a vertical direction without bothering the acceleration or tempo of the run (Jacoby & Farley, 89). That is essentially what high jump is, a change from horizontal movement to vertical movement to lift the body above the bar.

2.3 Physical preparation and needs

With physical preparation for any sport, it is crucial to develop the relevant fitness components needed for competition (Blumenstein, Lidor, & Tenenbaum 2007, 9). High jump is a sport which places emphasis on a powerful lower body.

Periodization is at the core of an athlete's training plan as it is a method by which training is broken down into smaller segments. The purpose of this is to ensure that an athlete will reach peak performance during important competitions. Typically the year of an athlete is divided into three main sections: preparatory, competitive and transition. Of these three, the preparatory and competitive phases can be further divided into sub phases. These sub phases are general and specific for the preparatory phase and for the latter, precompetitive and competitive. One cycle refers to the completion of these phases. Since track and field athletes typically compete twice a year (indoor and outdoor seasons), they follow a bi-cycle plan in which means they go through each phase twice during the year. (Bompa & Haff 2009, 125-127, 132).

High jump is a cyclical sport that ends in an explosive take-off and a relaxed flight phase. Power development of the legs is very important in high jump and as a result, and is often the focus of physical training. The aim is to increase explosive strength and power with as little hypertrophy as possible as excess body weight is detrimental to lifting one's centre of gravity. An increase of one kilogram in weight can decrease the height of a jump by as much as five centimetres, given other variables remain constant (Aura 1984, 7, 64.)

To achieve the proper physiological adaptations, high jumpers spend many hours in the gym weight training to achieve these results. In addition, explosive-ballistic strength training and plyometric exercises are used to help the athlete pounce forcefully upward at take-off. (Turner 2007, 3.)

2.4 Psychological preparation and needs

Due to the nature of the sport, mental preparation is a key element for success in high jump competitions (Shunk 2010). While there are limited published articles related to the psychological environment of high jump competitions, some conclusions can be drawn from research in similar fields.

When a comparison was made between track events and field events, one study suggested that mental training plays a larger role in outcomes for field events than in track

events. In addition, field athletes tend to use visualization more frequently and had strong physical sensations associated with imagery. This could be due to the breaks during field events which allow for more opportunities to stop and focus on imagery. (Ungerleider 2005, 16-17.) The mental focus during these breaks can play a crucial role as it is an opportunity for the mind to wander. A golf study demonstrated that the professional players were able to refocus on the task after a break between shots much better than inexperienced players (Thomas & Fogarty, 3).

Finally, Shunk (2010) has made several suggestions in terms of what high jumpers should focus on. Goals set in high jump should be process oriented rather than outcome oriented as the athlete has very little control over their rank for an event. Also, since it is such a technical sport, most of the goals should relate to technique. Furthermore, Shunk stresses the importance of routines. One reason why high jumpers choke during big competitions is because they view and approach them differently from previous competitions. It is important to create a clear plan and routine to be used in all competitions. Moreover, pre-jump routines are also important to help block out distractions such as simultaneous running events (IAAF 2002). Overall, it is crucial to prepare both mentally and physically for the challenges posed by a high jump event.

3 Psychological skills training

In this section, an overview of psychological skills training (PST) will be given. This includes the definition, aims, advantages of PST, and guidelines for a PST program can be implemented into an athlete's training regime. The implementation of sports psychology training for an athlete is recommended as it helps in areas where excellence and pressure are present (Jensen 5.11.2009).

PST is the systematic and consistent practice of mental skills for the purpose of increasing enjoyment, enhancing performance or achieving greater sport and physical activity satisfaction. Typically many of the methods and techniques used in PST come from a variety of areas of psychology such as behaviour modification, cognitive theory, rational emotive therapy, goal setting, attentional control, progressive muscle relaxation and systematic desensitization. Comparable to physical skills training, it is paramount that mental skills are practiced systematically. (Weinberg & Gould 2007, 250-251.)

3.1 Aims and focus of psychological skills training

The most common aims of psychological skills training are performance enhancement, and increased enjoyment, and the ultimate goal of a PST program is self-regulation (Weinberg & Gould 2007, 257). Mental preparation provides an athlete with techniques to overcome both mental and emotional barriers (Blumenstein et al. 2007, 11). Also, the focus of PST can vary greatly depending on the needs of the athlete; the program can be comprehensive or simply focus on one or two skills (Weinberg & Gould 2007, 251).

The most frequently sought after result from PST by athletes is performance enhancement. To reach this aim, many athletes use goal setting, imagery, relaxation, concentration and self-talk. These skills will be discussed fully in section 4 (pages 14 - 23). Since thoughts have been shown to influence behaviour, using mental skills and learning to control one's thoughts are a very direct manner to further excel in competitions. (Kornspan 2009, 41- 43)

Other aims of PST programs are to increase enjoyment and exercise adherence. However, these goals are more common when the participant is part of the general population rather than an elite athlete. As a result of increased enjoyment and adherence, a person is much more likely to live a more physically active life. (Kornspan 2009, 14.) Furthermore, these may be the main focuses for an injured athlete. Unable to practice and compete, many athletes may react very poorly to their injury, thus a PST rehabilitation program can be designed to help them remain positive and motivated during recovery. (Driediger, Hall & Callow 2006, 269).

Beyond the scope of better performance and higher levels of enjoyment, the ultimate goal of PST is self-regulation on the part of the athlete. This would mean the athlete is capable of working toward long-term and short-term goals by monitoring and managing her thoughts, feelings and behaviours without the constant direction of a coach. An athlete has reached this aim if they are successfully able to progress through Kirshenbaum's five stage model. The five stages of this model are problem identification, commitment, execution, environmental management and generalization. First, in the problem identification stage, an athlete is not only able to recognize an issue but is also able to realize that change is possible, and they take responsibility for the solution. Next, during the commitment stage, an athlete must remain persistent regardless of the speed of progression and must make an effort to practice skills regularly. In the execution stage, the athlete should actively carry out self-evaluation, self-monitoring and self-reinforcement. In addition, she needs to develop realistic expectations and maintain effort especially when setbacks occur. In the environmental management stage, the athlete should prepare methods to manage both social and physical environments. Basically, an action plan is needed to cope with factors that may mentally affect them. These include factors such as spectators or poor weather. Finally, in the generalization stage the athlete should maintain these efforts over time and extend these behaviours to new environments and conditions. For example, using relaxation methods to deal with anxiety caused by other aspects of life. Many researchers support this model and have found that many elite athletes engage in the behaviours listed in this five stage model. (Weinberg & Gould 2007, 257-259.)

Overall, when a PST program is designed correctly in an individualized and multimodal manner all the aims mentioned above should be reached. However, it must be noted that mental training is only one component of an athlete's training; it is not a panacea for performance improvements.

3.2 Advantages

There are many reasons to implement psychological skills training into an athlete's regular training program. Many advantages have been reported in studies, these advantages include performance enhancement, emotional and mental well being, and better coping abilities.

First, there have been a plethora of studies which suggest that in use of PST does increase performance. According to Blumenstein, Lidor, and Tenenbaum, psychological interventions have been proven to increase performance when comparing athlete's who have received PST with non-intervention athletes (2007, 11). One reason for this is that PST tends to target characteristics found in successful elite athletes. Common characteristics found in successful athletes were high confidence, self-regulation of arousal, an in-control but not forcing it attitude, great ability to concentrate and focus, and high determination and commitment. (Weinberg & Gould 2007, 255.) In addition, prior to the 1988 Olympics, Steven Ungerleider and Jacqueline Golding interviewed 1200 track and field athletes who participated in the US Olympic Trials. They found that all of the athletes trained hard, ate well, received sufficient rest and consumed little alcohol and other intoxicants. The difference between the athletes who made it to the games and those that didn't was that the successful athletes used more time on mental practices. (Ungerleider 2005, 4.) When Weinberg and Cormar conducted PST programs for 45 athletes in 1994, 85% demonstrated positive performance effects. More recent studies show even greater results, possibly because today programs tend to be multidimodal, focusing on a combination of psychological techniques and not just one aspect. (Weinberg & Gould 2007, 256.)

The advantages of PST are very significant when the impacts of mental and emotional components on performance are considered. According to Weinberg, mental and emo-

tional components often overshadow the purely physical and technical aspects of performance. In most sports this ratio is considered to account for as much as 50% of performance when competing with athletes of similar capabilities. For some individual sports (figure skating, golf) it has been suggested that the impact of the mental components are even greater, accounting for 80% to 90% of performance. (Weinberg & Gould 2007, 251.) Therefore, since mental components can play such a crucial role in sports, the advantages of improving these qualities are clear.

Furthermore, PST helps athletes with motivation, releasing tension, choking problems, and helps them get “in the zone”. Also, following PST many athletes are more able to cope with pressure (in athletics and normal daily life), they tend to rebound better following failure, and are more persistent. Yet another advantage of PST is that it helps build and develop mental toughness which is perceived to be the most important determinant of success in sport. (Weinberg & Gould 2007, 251.)

To recapitulate, the advantages of implementing a PST program are overwhelming. Numerous studies conducted during many decades indicate the positive effects of using various psychological skills in addition to regular physical training.

3.3 Procedure for designing a PST program

When designing a psychological skills training program there are various recommendations which should be followed. There are many considerations which should be taken into account, such as the nature of the sport, the needs of the individual, the periodization of physical training and the time available.

First, there are several suggestions regarding which topics to choose. Various experienced athletes and coaches listed relaxation training, concentration, imagery, team cohesion, attention training and self-talk strategies as important topics for PST programs (Weinberg 2007, 255). However, a program does not need to include all of those topics, there is no set PST package as each one should be individualized based on the needs of the individual and sport (Brookfield 2009).

In terms of timing, it is important to consider the periodization of the physical training when planning a PST program (Blumenstein et al. 2007, 9). The ideal time to start a PST program is during the off-season as there is more time to focus on mental training (Weinberg 2007, 260). In addition, during this phase the athlete is not under competitive pressure, skill acquisition is maximal because the stress level is low (Blumenstein et al. 2007, 35). During the preparation phase, it is important to fully learn these mental skills and prepare for the competitive phase both mentally and physically. During the competitive phases of the annual plan, the aim for the mental training should be to bring it all together. Following this is the transition phase is a time for a break from both mental and physical training. (Blumenstein et al. 2007, 10).

According to Weinberg and Gould, a PST program should consist of an education phase, and acquisition phase and a practice phase (2007, 256). A similar approach is suggested by Murphy who believes the PST is a partnership between the coach and athlete with an introduction, education phase and action (2005, 287).

The goal of the education phase is to familiarize the athlete with PST and sport psychology in general. The duration of this phase depends completely on the individuals involved, it can be conducted in an hour or it can span several sessions. A good starting point would be to ask about the athlete's current knowledge of PST, and about their current practices (do they use mental training and how often). From there, the person running the session can use follow-up questions and correct any misunderstandings. The next logical step would be to introduce various topics such as goal setting, imagery, concentration (any topics relevant to the PST program). Finally, one technique to help emphasize the importance of PST, examples can be given of how the athlete's role models use different mental skills. At the end of the education phase, the athlete should have a much better understanding of PST and its importance. (Weinberg & Gould. 2007, 256.)

The next phase is the acquisition phase during which, the focus is on strategies and techniques used for learning the different psychological skills. For example, imagery could be taught through guided imagery sessions. This phase should span over several

sessions to ensure that the athlete fully learns and understands the technique. The phase should consist of both informal and formal meetings. Informal meetings are good because the atmosphere is more relaxed and this can help with building rapport with the athlete. Also they tend to be shorter and easier to schedule, they can be used to check up on the athlete's progress and to answer any queries. Formal meetings are useful when a clear structured session is needed in teaching the skills. Finally, it is important to individualize the learned techniques to the needs of the athlete to help them relate to it so they will then learn it much faster. (Weinberg & Gould. 2007, 257, 267.)

Following the acquisition phase is the practice phase. The aims of this phase are to use overlearning to automate the skills, to teach the athlete how to incorporate the learned techniques into performance situations and to stimulate skills they will want to apply in actual competitions. In comparison to the acquisition phase, the practice phase will have fewer meetings with the sports psychologist, as the aim is to practice the skills on their own. An example would be moving from guided imagery used during the acquisition phase to self-directed imagery. With less frequent meetings, it is recommended that the athlete keeps track of progress and perceived effectiveness of the techniques in a training journal. This can produce tangible evidence for the athlete to see what techniques work the best and to see her own progression. Also, training journals are effective as time on a task is much higher when they are used (Blumenstein et al. 2007, 56). Overall, the crucial factor during this stage is repetition to help the athlete thoroughly learn and understand her own responses to the new skills. (Weinberg & Gould. 2007, 257.)

In conclusion, there is no one correct way to design and implement a PST program. Some key factors in designing a PST program include implementing education, acquisition and practice phases, incorporating the mental training practices with other areas of training and individualizing the program. In the end, to increase the effectiveness of a program, it has to be a well-controlled, outcome-based intervention in a competitive environment (Weinberg & Gould 2007, 256).

4 Overview of Mental Skills

The following section will cover some of the most common mental skills taught during a psychological skills training program. As mentioned earlier, the most common mental skills taught during PST are concentration, goal setting, imagery, self-talk and relaxation. Since the main focus of this particular psychological skills training program for the high jumper is on concentration, this topic will be discussed in further detail than the other mental skills.

4.1 Imagery

Imagery is a technique using all senses, thoughts, feelings, emotions and sensation to recreate an experience in your own mind. It is a skill used by some of the world's best athletes every day. (Yukelson 2006, 1.) Research shows that imagery works, those who mentally practice their performance perform better than athletes who do not (Miller 2003, 33). However, it is rather important to follow certain methods to avoid some of the potential problems associated with imagery.

First, there are countless uses and benefits for imagery. Possibly the greatest advantage is that everyone has the ability to do it and that it can be done almost anytime and anywhere; it is a skill that must be practiced and developed (Yukelson 2006, 1). Different uses for visualization include practicing a specific skill in the mind, improving confidence and positive thinking, rehearsing tactics and problem-solving, controlling nerves, review and analysis, preparation and it can be part of a performance routine (Bull & Shambrook 2004, 65).

Furthermore, there are many studies which support these benefits and demonstrate them at the neural level. Electrical activity in the muscles and brain associated with the movement take place during mental rehearsal. The brain mimics firing the muscles in the patterns that are needed to execute the skill, but not at the level where the body actually moves. (Bull & Shambrook 2004, 70; Yukelson 2006, 1.)

A similar response occurs when observations are made of other people performing a certain action, this adds learning benefits to watching role models in action. This is called scenario performing which can help skill acquisition (Jensen 5.11.2009). Mirror neurons trigger certain patterns when an athlete watches, for example, their role model perform. Then these same patterns are reactivated when the athlete performs the observed behaviour. (Bergland 2007, 100.) Every time a movement is done or rehearsed, that neural pathway becomes stronger. The opposite is also true, if a certain pathway is not used it will eventually atrophy. This means that if negative images are consciously blocked out and replaced by positive ones, negative images are less likely to emerge during future mental rehearsals. (Murphy 2005, 133; Bergland 2007, 53.)

Next, there are two main perspectives which are used during imagery: an inside perspective or an outside perspectives. The internal perspective is when the images are seen from the first-person point of view and the external perspective is like watching oneself on a TV. The internal perspective develops a better quality of the 'feel' component, while the external perspective is good when reviewing performances and objectively assessing it. It is good to try both methods, there is no conclusive evidence that would suggest that one is better than the other. (Bull & Shambrook 2004, 66; Murphy 2005, 130.)

When imagery is first being practiced there are several useful guidelines for beginners. The location should be someplace quiet where interruptions won't occur. It is important to incorporate all the senses, the most important one is kinaesthetic feelings such as balance, and weight movement as this helps the brain recall images from within the memory stores. Also, it is important to practice mainly in real-time as this prepares the athlete for a full-paced situation. Also, focus should not be on past mistakes, as this increases the likelihood of their reoccurrences. (Bull & Shambrook 2004, 70-73)

Moreover, it is important to visualize difficult situations, this way the athlete can rehearse certain responses and then react appropriately should something go wrong in a competitive situation. Anticipation is the main entity, knowing what to do if something happens. Also the focus should be on the process of the performance and not on the

outcome, but occasionally imagining a successful end result during practices can be a good motivator as it is a reminder of what the athlete is working towards. (Miller 2003, 36-39)

Finally, there are several aspects which should be taken into consideration with imagery because it is possible to harm an athlete's performance if certain situations are overlooked. First, it is important to remember that images can hold a personal meaning which is different for each individual. For example, when figure skaters were asked to visualize a golden ball, some saw a calming aura while others were and blinded and stressed by it. In addition, relaxation imagery can have a detrimental effect in strength events. Also, imaging the end result during the competition can distract from the process. Other potential problems include a lack of imagery control, when unfavourable images are seen. This is dangerous as the effects of negative images are stronger than the positive effects of appropriate images. Fortunately, almost all problems can be overcome with an appropriate approach of replacing negative images with positive ones and using self-talk and relaxation to help. (Murphy 2005, 136; 150-151.)

Overall, using mental rehearsal is a great manner for the mind to communicate with the body as the body only speaks image, therefore it is a tool which should be used by all athletes (Jensen 5.11.2009). However, it is important that athletes have realistic expectations as imagery only has the potential to improve skills if the athlete believes in the process and practices often (Yukelson 2006, 2). The importance of practice and repetition is the most crucial aspect of imagery as it is the best way to improve this skill as it leads to greater vividness and control of the images (Murphy 2005, 144). Finally, this practice also causes the skills to be hardwired into the brain; a lack of practice will lead to reverting to old habits under pressure situations (Bull & Shambrook 2004, 69).

4.2 Relaxation

The competitive environment of sports can be rather stressful, it is for these purposes that relaxation skills are used as an aid to relieve some of these pressures. If an athlete is tense, the tension can weigh them down and lead to much faster fatiguing during a competition. The first steps to releasing this tension and learning to relax is to learn to

release and breathe, and learning to create good feelings and a positive focus. (Miller 2003, 52 & 56.)

There are many different relaxation methods which can be used to control this performance debilitating anxiety. Some of these methods include progressive relaxation, biofeedback, meditation and breathing techniques. First, progressive relaxation is a method in which muscle groups are individually tensed and then relaxed. This leads to a calm and relaxed state. A sample transcript for this practice has been provided (attachment 1). The next method is biofeedback which uses technology as a guiding tool. Electrodes or a heart rate monitor can be used to monitor, and show an athlete the physiological symptoms of tension. The task is then to try and lower the heart rate or muscle tension by means of a conscious effort. This provides instant feedback regarding the effectiveness of different techniques. (Kornspan 2009, 48.)

The next two techniques are meditation and breathing techniques. Breathing techniques are effective because breathing unites mind and body and it brings focus to the present (Miller 2003, 44). There are a variety of different breathing exercises, the main aim of all of them is to bring focus to this process of breathing which is something that often goes unnoticed. These exercises include imagining different compartments in the lungs, breathing in and out to a count and many others. The final relaxation method is meditation. There are no set meditation methods, one technique involves repeating a single word, such as “calm.” The idea is to let other thoughts pass without notice and this leads to a more calm and relaxed state. (Kornspan 2009, 48.)

To recapitulate, the use of relaxation techniques is a good method to reduce an athlete’s anxiety in competitions and in practice. To be able to achieve the maximum benefits of these exercises, they should be practiced regularly for at least a couple months (Weinberg & Gould 2010, 279).

4.3 Goal setting

According to Kornspan (2009, 44) when optimal performance is the aim, goal setting is one of the most important skills taught to athletes. There are several different types of

goals an athlete can have, also there are several essential goal setting guidelines which should be followed to produce effective results.

In short, goal setting is the process of personal planning. It brings focus to important details, mobilizes efforts, prolongs persistence and helps an athlete develop new strategies (Weinberg & Gould. 2007, 348). Goal setting is often taught to athletes who are struggling with motivation as it helps bring purpose to training and competition (Robson 2007). One of the most recommended guidelines is to follow the principles set by the SMART acronym. Goals should be specific, measurable, attainable, realistic and within a set timeframe. (Kornspan 2009, 45; Robson 2007.)

There are three types of goals: outcome goals, performance goals and process goals. Outcome goals are related to specific results of a competition or one's performance compared with others. Performance goals are related to individual performance, independent of others. Process goals are related to performance goals as they are the steps one must take to achieve the performance goal. There are several different types of process goals which are, tactical, technical, physical and psychological goals. For example, wanting to increase leg strength by 10% is a performance goal and aiming to go to the gym three times a week to make this happen is a physical process goal. (Kornspan 2009, 44; Robson 2007.)

Finally, there are several methods which can be used make the most of goal setting and to increase the likelihood for success. Writing down the goals and keeping a training journal have been shown to improve commitment to the goals. In addition, sharing the goals with others can also have a similar effect. Another important factor is evaluation. Tests should be done regularly to be able to keep track of progress, and it provides the athlete with feedback regarding their methods for achieving the goals. (Robson 2007.) Overall, goal setting is an important skill to learn as it bring focus to various tasks and can improve motivation.

4.4 Self-talk

Self-talk is the act of talking to oneself, this can be done out loud or by thought. Therefore, anytime an athlete thinks about something, she is “talking to herself” and this is a type of self-talk (Ungerleider 2005, 24; Weinberg & Gould 2010, 378.)

The process of self-talk has three phases: an environmental stimulation, followed by a perception or evaluation which results in certain emotional, physiological and behavioural responses. In this process, self-talk is a mediator between an event (environmental stimulation) and the final response to this situation. This suggests that the response to an event is influenced by self-talk, meaning that the same event can result in a response that is either defeating or helpful. An example of two contrasting perceptions to a missed shot in a tennis game could be, “What an idiot—I’ll never win this game now!” and “Keep your eye on the ball—this match isn’t over.” The first statement results in anger, hopelessness and increased muscle tension while the latter statement nurtures increased concentration, optimism and calmness. This process of self-talk portrays the importance of developing and controlling this psychological skill. (Weinberg & Gould 2006, 382.)

Therefore, in an attempt to modify an athlete’s responses to certain situations, positive self-talk is often used. When athlete’s use this type of self-talk, they are less easily distracted, their mind is more receptive and more of their focus on the present and the competition. Misguided thinking leads to poor performance, positive self-talk can be used to correct those thoughts. (Ungerleider 2005, 25.) Furthermore, other benefits of this technique include enhanced concentration, it is a tool for breaking bad habits, it is a manner of initiating action and sustaining effort and can be used to help skill acquisition (Weinberg & Gould 2010, 378).

The first steps to building a more positive attitude to nurture better performance is for an athlete to become aware of their thoughts (Kornspan 2009, 51). Once an athlete is more aware of her thoughts, the negative self-talk should be written down and alternative, more positive sentences should be written down and then used as replacements for the negative statements (Weinberg & Gould 2010, 382). Furthermore, simply re-

peating positive statements can lead to a more positive overall mental attitude, it is however important to remove the negative and not simply add more positive statements (Bull & Shambrook 2004, 67; Kornspan 2009, 50-51).

As with the other mental skills, practice is a vital component in transforming defeating self-talk to helpful and positive self-talk. This method appears to be fairly simple, however meticulous effort is required to reap all the benefits.

4.5 Concentration

Concentration is a mental skill which can play a crucial role in sports however, it is not an easy skill to learn (Kornspan 2009, 49). Like the other mental skills, it can be enhanced with practice and should be treated like a physical ability (Bull & Shambrook 2004, 76). To portray a complete picture, key terms related to concentration will be defined, also methods of improving this mental skill will also be covered.

4.5.1 Definition

First, concentration in sports is a fairly complex concept and can be defined as maintaining selective attention over time, having awareness of the situation and shifting attentional focus when needed. The definition can be broken down into four parts which are, selective attention, maintaining attentional focus, awareness of the situation and shifting attentional focus when needed. (Weinberg & Gould 2010, 364-365.)

Selective attention is focusing on relevant environmental cues and disregarding irrelevant cues. Preferential information is selected and the rest is ignored; errors occur when focus turns towards distractions. These distractions can be noise, the behavior of other athletes, visual distracters or weather conditions. (Murphy 2005, 119-121.) In addition, research suggests that performance suffers the more you focus on yourself or things near you. This means athletes should aim for external focus rather than internal focus. For example, in hockey it is better to focus on the path of the puck rather than the stick. Finally, when skills become automated, they require less attention and focus can be directed to other relevant cues which will further better performance. When

learning to dribble, beginner may need to look at the ball constantly. However, when this skill is improved, constant eye contact with the ball is not needed and the athlete can focus on other relevant cues such as the movements of opponents. (Weinberg & Gould 2010, 365.)

The next part of the definition is maintaining attentional focus. Maintaining concentration during a competition can prove to be a challenging task since the average length of time that thought content remains on target is 5 seconds (Weinberg & Gould 2010, 365). Concentration should be thought of as a volume dial or light switch, the level needs to be adjusted. It is something that can be toned down or turned off during breaks and switched back on when needed. It is impossible to remain 100% focused for the entire duration of an event. Different cues can be used to help with switching in and out. These cues can be verbal, visual or physical (slapping legs, deep breath). (Bull & Shambrook 2004, 84.)

The third part of the definition is maintaining situation awareness. This is the ability of the athlete to understand what is happening here in terms of game situations, and opponents in order to make the appropriate decisions. Often these decisions must be made under competitive pressures. When athletes become skilled at this, it may often seem as if they are always one step ahead of their opponents and this is simply because they are more aware of their opponents and the situation. (Weinberg & Gould 2010, 367.)

Shifting attentional focus is the final part of this definition. During an event it is often crucial to shift between the different types of attentional focus since, most errors related to concentration happen because an athlete does not shift to another style of attentional quickly enough (Bull & Shanbrook 2004, 79). Attentional focus can be looked at on two dimensions: direction which can be internal or external, and width which can be broad or narrow (Nideffer in Kornspan 2009, 49). When it is external, attention is directed outward toward an object or opponents. Internal focus is directed inward to thoughts and feelings. This is the appropriate direction of focus when a high jumper prepares to start the approach run. A broad attentional focus allows an athlete to

perceive multiple incidents simultaneously. A narrow focus happens when an athlete only responds to one or two cues.(Weinberg & Gould 2006, 373.) Finally, when these two dimensions of Nideffer's model (in Kornspan 2004, 49) are combined, the following four categories emerge:

- External broad: Focus on multiple outside cues, assessing a game situation.
- External narrow: Focus on a single object or person.
- Internal broad: Analysis or development of a game plan.
- Internal narrow: Controlling an emotion or mentally rehearsing an upcoming performance.

4.5.2 Methods to improve concentration

There are a plethora of different methods for improving concentration. Some of these methods can be used during the competition while others are done in a controlled environment.

One method is the use of imagery as its use increases ability to maintain concentration over a period of time and on staying focused on what is important. (Bull & Shambrook 2004, 74). Focusing on the appropriate aspects ensures that the athlete remains in the moment during the task (Kornspan 2009, 49). Another fairly simple method to improve concentration in competitions is by improving general physical fitness. Poor fitness and nutrition leads to fatigue and makes concentration a larger effort for the athlete, this can play a fairly large role towards the end of a competition. (Bull & Shambrook 2004, 83)

Creating pre-performance routines is a way to bring focus to the task. These routines should be written down so that the athlete can refer to them during the competition, should something go wrong. They are good for track and field events, such as high jump, which have self-paced components. (Kornspan 2009, 50.) In addition, this practice improves concentration as routines prepare the mind and body to be able to execute skills with maximum focus and belief. Finally, the pre-performance routine should

be clear and simple because it is then easier to recall during the game and concentration is thus more readily achieved. (Bull & Shambrook 2004, 83, 88).

Another method to improve concentration during a competition is to become more self-aware. Not only is it imperative to have the appropriate focus leading up to the competition, but it is equally as significant to be able to quickly recognize if concentration is lost and at this point everything must be done to try and regain it as quickly as possible. Remaining focused means remaining in the present as past and future events are irrelevant and take away from the current task. (Bull & Shambrook 2004, 77, 81).

Moreover, the concentration grid exercise is a highly recommended tool. The grid consists of numbers from 00 to 100 in random order and the aim of the exercise is to find as many numbers as possible, in order, within a certain time limit. It should be done in a quiet area without distractions, but these should be incorporated later to make the task more challenging. (Kornspan 2009, 50; Weinberg & Gould 2007, 381.)

Other techniques include thought stopping and thought parking. Thought stopping involves controlling negative energy which may lead to poor performance. The idea is that every time a negative thought is noticed, this is stopped using self-talk. When the negative thought is stopped, the athlete disassociates from it and is then available to focus on the performance. (Ungerleider 2005, 65) Thought parking uses a similar approach, however it often incorporates imagery as a means to store an irrelevant thought for later. For example, following a mistake, an athlete can imagine storing the thoughts related to the mistake in a parking lot, or storage file and decide to go back to it later, after the game when there is time to think about it. (Bull & Shambrook 2004, 82.)

Overall, it is very clear that concentration plays a key role in performance success and this is why it has become such a central part of this thesis and case study. To finish off with the words of Murphy (2005, 123) which truly demonstrate the importance of improving concentration. "In reality, there is no distraction until we recognize it internally."

5 Purpose of the study

5.1 Aims of the study and intervention

The aim of this case study was to examine the effects of a psychological skills training program on the competitive performance of a nationally ranked high jumper in elite level competitions.

Naturally, the main aim of the intervention was to positively affect the elite level competition results of the high jumper as she appeared to be struggling during these specific competitions. This was determined by comparing the results of elite competitions from the 2008-2009 season with the results from the 2009-2010 season. In addition, another goal was to affect the athlete's knowledge of psychological skills and their uses.

It was hypothesized that the PST program would have a positive effect on the athlete's performance during elite level competitions and the results would more closely match the results in regular competitions. Furthermore, the athlete's knowledge of mental skills would increase significantly.

5.2 Research question

Relating to the aims mentioned above, there was one main question:

- Does the use of a structured PST program lead to an increase in competitiveness in elite competitions for this particular athlete?

To clarify the research question, the terms competitiveness and elite competitions will be defined. Competitiveness refers to the athlete's ability to compete for higher ranks in a competition. In high jump the rank is directly linked to the result which means that these two are directly related, especially since the comparisons are done between only elite competitions, which are frequented by the same competitors. However, the idea is not to simply perform better in a single competition, but to do so in a consistent manner.

The elite competitions refer to the senior level Finnish Championships and the Vattenfall Elite Games league. The Vattenfall Elite Games league is a series of five competitions which took place throughout the summer; they can be compared to the IAAF's Golden League only on a much smaller scale. These competitions were frequented by international participants thus, the level of competition was much higher than in typical Finnish competitions.

6 Research methods

Despite being a case study thesis, the majority of the data which was analyzed was quantitative. The data used for analysis were results from all the competitions the athlete competed in. These results were readily available online, which made the data collection process very simple and easy. For comparison purposes, the results from both the 2008-2009 and 2009-2010 seasons were collected and analyzed. The first season occurred prior to the program and the latter was in conjunction with the PST intervention.

Some qualitative data was also collected however this data was mainly gathered as a precaution. After each competition the athlete answered an open-ended questionnaire, kept a fairly informal training diary for psychological skills sessions and multiple meetings. Since the case study only involves one athlete, qualitative data was collected in case of injury, when the quantitative data would not have been available. In addition, interviews were conducted through-out the research process as they were a part of the PST intervention. Due to a request from the athlete, none of the competitions reports or interview transcripts will be attached to the thesis. They were written in confidence and to respect this, they will not be published.

The study can be separated into two main phases, the pre-intervention phase and the intervention phase during which the PST program was implemented. The entire procedure lasted approximately 16 months from June 2009 until September 2010.

6.1 Participant background

The athlete is Laura Rautanen, a Finnish high jumper and heptathlete. She has been involved in sports for most of her life and competes at the national level in Finland, in senior level competitions and during the course of the study she also competed in the U23 age category. During the past several years, Rautanen has chosen to compete less in heptathlons and focus on the high jump event. During the intervention, she was at a crucial point in her athletic career as she was transitioning from the Junior level to participating exclusively in Senior level competitions.

The physical and technical abilities of Rautanen are evident from past successes in her sporting career. Prior to the start of the intervention, her indoor record for the high jump was 174cm and her outdoor record was 179cm both of which she achieved during the 2006-2007 season. She had not won any medals for high jump at the Senior Finnish Championship level however, at the Junior Finnish Championship level she had won a total of 5 gold and 4 silver medals in both indoor and outdoor competitions. She was also a member of the Junior Team Finland training program and had represented Finland at the Junior level on five different occasions in international competitions. (Tilastopaja OY.)

Prior to the implementation of the PST program, Rautanen had not taken part in any organized mental skills training programs. While she had heard of psychological skills training, she was not very familiar with it. Her clear interest in sports psychology was one of the reasons she was chosen as the participating athlete for this study. In addition, she is very open minded and committed to her sporting career, these were promising signs that great performance enhancements could occur with this intervention.

6.2 Pre-intervention phase

The pre-intervention phase consisted mainly of observations and a couple informal interviews. The purpose was to become more familiar with the athlete, the sport and to gather a baseline of competitions results. This phase lasted approximately 17 weeks from the start of Rautanen's outdoor competitions in 2009 until the end of her 2008-2009 season, according to her annual training plan (attachment 2). This was done so that when intervention phase started, it would be easier to take into consideration her physical and technical training. In addition, the final two weeks of this phase were during part of her transition phase of the training plan, which gave plenty of time to plan the intervention with some input from the athlete.

During this phase, the researcher was present at a total five competitions. As mentioned earlier, the purpose was familiarization with the sport and competitive environment. Therefore, some passive observations were made and friendly support was given

but no form of mental skills training or advice was given. Before and directly after these competitions, some informal meetings took place. The purpose of these was to get a better understanding of the athlete's thoughts. Finally, simply being present and spending more time with the athlete helped build rapport and trust.

Once the competitions ended in mid-September, all the results from the entire season were collected from Tilastopaja OY's online database of track and field results. Then the different competitions were grouped into two different categories, regular competitions (RC) and elite competitions (EC). Senior level Finnish Championships and the Elite Games were grouped as EC. These were considered EC as they were typically much larger events than most other competitions, and they received wide media attention in Finland and all the Elite Games included international competitors. Another factor which made these competitions more important for Rautanen was the presence of members from the Finnish Athletics Association (SUL). All other competitions were considered RC. These competitions are much smaller and competitions Rautanen was used to competing in, such as her hometown Championships where she was often the only competitor for the high jump event, and Junior level Finnish Championships.

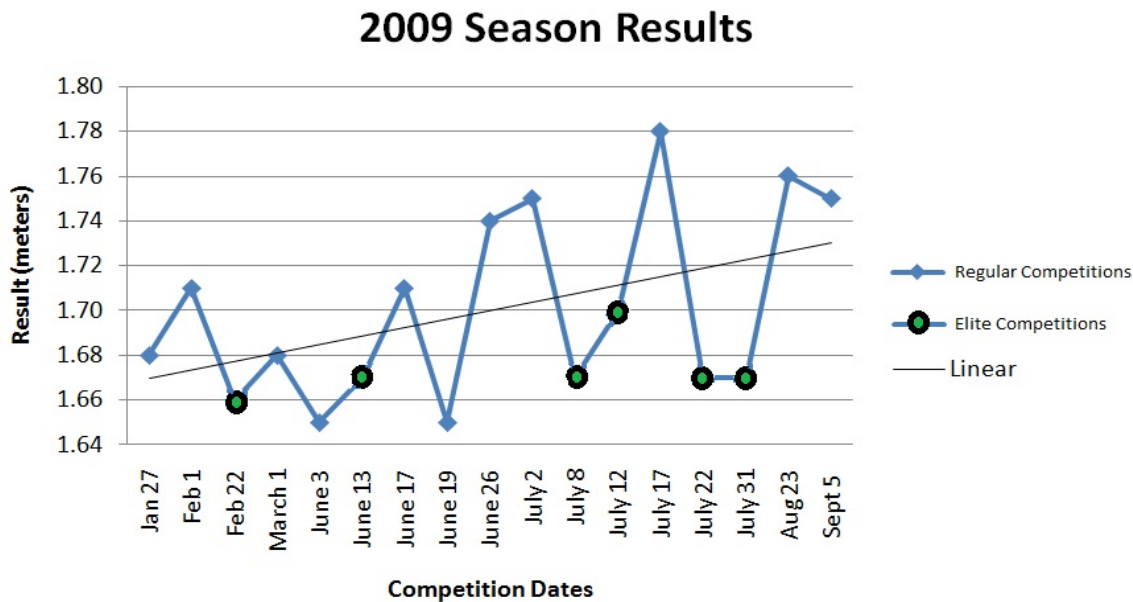


Figure 2. Summary of Rautanen's high jump results from 2009

Next, these results they were chronologically organized into a line graph (figure 2). In addition, a linear trendline was added to demonstrate the progression of the athlete's results throughout the season. As can be seen, Rautanen took part in 17 competitions,

six EC and eleven RC. Some basic observations which can be made about this season are that she did not improve her indoor record of 1.74m or her outdoor record of 1.79m. All of the EC results fall below the linear trendline. Furthermore, the average result of RCs between June 26 and September 5 (the last five RCs of the season) was 1.76m (rounded up from 1.756) and the average result from this same time frame for ECs was 1.68m (rounded up from 1.6775). That is a difference of 8 centimetres on average that her result suffers during EC in comparison to RC. In such a short time-frame, and without the incidence of injury, physical factors were not the cause of the lapses. The analysis brought a clear focus to the intervention, to improve Rautanen's competitiveness in ECs. This is crucial for her athletic career's future.

No further analysis of this data was conducted in terms of more in depth statistical analysis as the purpose was simply to get the baseline results and a direction and focus for the PST intervention. However, to narrow down the focus of the PST program further, a couple informal meetings were set up to discuss this observation and a checklist of performance states was conducted for the last EC which was freshest in her mind, and possibly her worst competition of the season, the Senior level Finnish Championships 2009. Rautanen's results for the checklist are displayed below (table 1). It was considered the worst competition of the season because for the first time, she did not make it past the qualification to the final despite being in great physical form.

Table 1. Checklist of performance states for the 2009 Finnish Championship competition. Adapted from Weinberg & Gould 2007, 275

Played extremely well	1	2	3	<u>4</u>	5	6	Played extremely poorly
Felt extremely relaxed	1	2	3	4	<u>5</u>	6	Felt extremely anxious
Felt extremely confident	1	2	3	<u>4</u>	5	6	Felt extremely unconfident
Felt in complete control	1	2	<u>3</u>	4	5	6	Had no control at all
Muscles were relaxed	<u>1</u>	2	3	4	5	6	Muscles were tense
Felt extremeley energetic	1	2	<u>3</u>	4	5	6	Felt extremeley fatigued
Self-talk was positive	1	2	<u>3</u>	4	5	6	Self-talk was negative
Felt extremely focused	1	2	3	4	<u>5</u>	6	Felt extremely unfocused
Felt effortless	1	2	3	4	<u>5</u>	6	Felt great effort
Had high energy	1	<u>2</u>	3	4	5	6	Had low energy

Focusing on the extremes (responses of 1-2 or 5-6), Rautanen felt very anxious, unfocused, the performance felt like a great effort, yet her muscles felt relaxed and she had

high energy. The purpose of this exercise was to get a better idea of how she experienced her worst competition of the season, it served as a great platform for follow-up questions. In one meeting she expressed that in the days leading up to the competition she felt very hopeful regarding the competition and was looking forward performing well in the final. Thus, she simply expected to coast through the qualification round. Her thoughts were focused on future events, which can prove to be very detrimental to performance as her focus was elsewhere and not in the present moment.

In addition, when asked about her thoughts regarding the Elite Games League, she felt as if she had to perform well in those competitions as these were the competitions in which she would gain recognition due to the media coverage and international participants. As with the Finnish Championships competition, her thoughts were on events and consequences which may occur in the future, rather than the actual competition. Another behaviour which appears to detract from her performance was the habit of watching the other competitors. She would watch her competitors perform, and felt bothered if she missed something while looking the other way. Finally, one competition which stood out in my mind was the RC on June 19th. It was her lowest result of the season 1.65m but that is not what was interesting, instead her attributions for the poor results were some of the first indications that she may need help with improving concentration. After the competition she complained about the light rain, and the positioning of the landing area. These issues bothered her from the moment she saw the competition area and distracted her during the competition. From these observations, it became apparent that the PST program should focus on developing her concentration skills.

6.3 A description of the PST program

As mentioned earlier, the idea was to connect this PST program to the athlete's annual training plan for the 2009-2010 season. Therefore, a simplified version Rautanen's training plan of the 2008-2009 season was used as a guide (attachment 2). The 2009-2010 training plan was not used as it was not complete at the time the program design took place. The idea was to move from the acquisition phase to the practice phase at least a couple weeks prior to the competition phase as then she would be familiar with

the techniques by the time she had to compete. The PST program for this case study started in early October 2009 and ended in late September 2010. Since Rautanen's physical training follows a bi-cycle annual training plan, it was decided to organize the PST program in a similar manner. Thus, the program was initially planned up until the end of the first competition phase (end of cycle one). The rest of the program was planned after an evaluation of the program was conducted following cycle one.

The main focus of the PST program was to improve the athlete's concentration skills. Since the mental skills seem to be linked, other skills such as imagery and self-talk also played a fairly central role in this program. The idea was to introduce multiple exercises to Rautanen and after practicing them for several weeks (acquisition phase), she would choose her favourite ones and continue using them during the practice phase.

6.3.1 Cycle one

While the first cycle of the program started well, it did not go quite as planned. Rautanen sprained her ankle during training in January and it kept her out of most of the indoor competitions. Fortunately, this injury did not impact the PST program in a harmful manner, some modifications were made to better suite her situation.

A basic summary of the first cycle of the program is depicted in figure 3. The figure demonstrates how the mental training was practiced in relation to the physical training, including the time she spent recovering from an ankle sprain.

Month	PST Phases	Physical Training
October 2009	Education	Preparatory phase 1
November 2009	Acquisition	
December 2009	Practice	
January 2010		Injury rehabilitation
February 2010		Competition phase 1
March 2010		Program evaluation

Figure 3. Design of cycle one in relation to physical training

Education phase 1

This phase started in October 2009, lasted three weeks with three formal meeting sessions. The first meeting lasted approximately 30 minutes and consisted of a basic overview of psychological skills training, a look at the program and the researcher took the time to answer any questions Rautanen had regarding the program and PST in general. The second meeting started with a review of the previous meeting. Following the review, an in depth look at concentration was taken, with details regarding the theory, the advantages of good concentration skills and methods of improving this skill. The final session of the education phase started like the second one, with a review of the previous meetings' topics. The topics for the final meeting were imagery and self-talk which were discussed in more detail. In addition, her goals for the upcoming season were discussed. At the end, it was agreed to start the acquisition phase of the program the following week.

Acquisition phase 1

This phase spanned seven weeks from October to mid-December with a total seven formal meetings. These meetings lasted approximately 20 minutes per session, and the purpose was to introduce different skills to Rautanen and practice the skills with her. This way any errors could be spotted and she could easily ask questions about the tasks. During the first meeting Rautanen was given a two-page handout which contained methods from improving concentration and tips for using self-talk (attachments 3 and 4). Each week one or two different exercises from that handout were reviewed, then she was to practice the skill on her own during the week. Below is a basic summary of the meetings during the seven weeks of this phase:

- Week 1: Concentration grid and parking thoughts.
- Week 2: Rehearsing game concentration (guided imagery).
- Week 3: Learning to shift attention.
- Week 4: Distraction training and Self-talk tips.
- Week 5: Changing negative thoughts to positive.
- Week 6: Learning to maintain focus and creating a “What if” list.
- Week 7: Establishing a competition routine.

Practice phase 1

Started in mid-December and continued until March, there were a total of five meetings during this 12 week span. During the practice phase, meetings were fairly irregular as the aim was for the athlete to learn to practice the acquired techniques individually and at times which seemed optimal for her. The first meeting was very short and rather informal as the start of this phase, and its aims were simply discussed. One aim was for her to focus less on what others were doing, both in competition and during camps. As mentioned earlier, Rautanen sprained her ankle during this phase and it led to some changes from the original plan. The day after the injury, a second meeting was held and healing imagery was introduced, also her goals for the indoor season were modified. The aims were to simply recover properly and not set any outcome goals for any possible competitions.

The final three meetings took place in relation with the two RC that she was able to take part in. One meeting before the first competition, the second midway between the two competitions, and the third meeting took place after the final competition. During these meetings several things were discussed, such as her any worries she may have had. Also, her adherence to the healing imagery and concentration practices were followed-up on. In addition, in the final meeting the indoor season was reviewed.

Evaluation phase 1

During the evaluation meeting, Rautanen was asked to provide feedback regarding the first cycle of the PST program. This feedback included dissatisfaction with the weekly schedules, because for physical training she was given daily schedules which she felt worked better for her. When exercises were given on a weekly basis, she said that occasionally she would forget about some of the exercises and complete them all on a Sunday. In addition, all the feedback from the practice sessions was verbal, so there was nothing written down, no tangible record of her practices. Furthermore, she mentioned that she felt pretty anxious during her two competitions and was not sure how to deal with these emotions. On the contrary, she enjoyed the structured meetings and the variety of different exercises. Overall, she rated cycle one at a 8.5 out of 10.

Due to this feedback, several changes were made to the program for cycle two. The first was to add some relaxation techniques which were introduced during a second, much shorter education phase. Moreover, a training log was also included as a regular part of this program. The aim was to further increase adherence as this tool was very familiar to her from physical training.

6.3.2 Cycle two

Fortunately, cycle two of the PST program was injury free and the program went as planned from the start. A summary of this phase is depicted in figure 4. This cycle started in April of 2010 and continued until the end of September 2010. Similar to cycle one, there were four phases, however since there were less new skills to learn, the education and acquisition phases were considerably shorter.

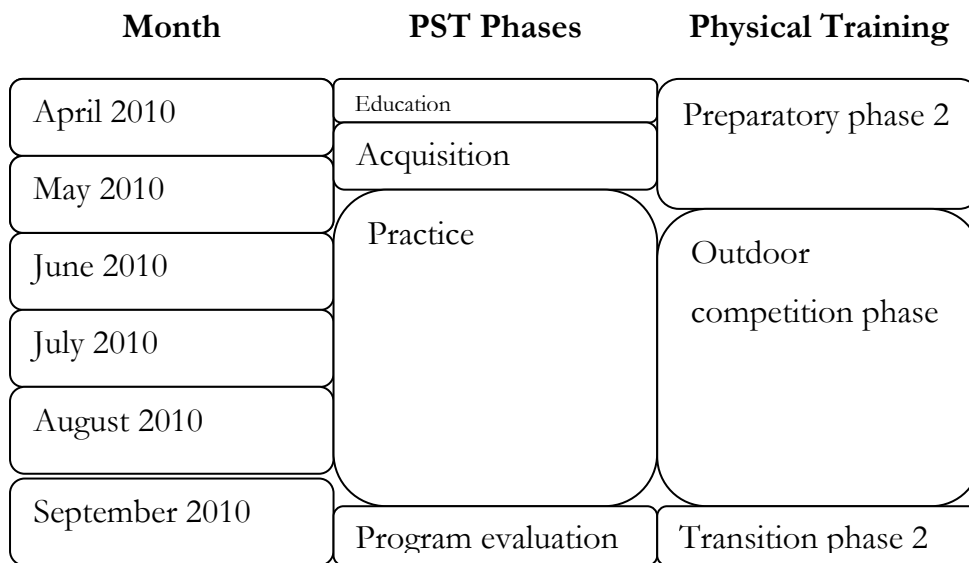


Figure 4. Design of cycle two in relation to physical training

Education phase 2

Consisted of one meeting in early April. The main focus of the meeting was the introduction of relaxation techniques. During this meeting, an additional handout was given to Rautanen (attachment 5). This handout described the three main exercises to be used for relaxation (breath control, progressive relaxation and relaxation response).

These three methods and their importance were reviewed but not practiced during this meeting as time was fairly limited.

Acquisition phase 2

During the following three weeks, the aim was to become familiar with the three relaxation techniques. Each of these methods were practiced during a certain meeting and then Rautanen was responsible for practicing only that certain skill during the time between meetings. In addition to acquiring these methods, Rautanen was asked to continue practicing the exercises from cycle one, and recording feedback from these practices in a training log.

Practice phase 2

The longest phase of the program at 19 weeks from May until September, consisted of five formal meetings. Similar to the first practice phase, there were not many formal meetings during this period. Most of the practices were done individually by the athlete and most questions or concerns were addressed in an informal setting. On one occasion, a meeting was held during a practice session for her physical training. The aim of this session was to simulate the competition environment by introducing additional distracters, distraction training (attachment 3). The other four formal meetings took place a day or two before certain competitions. There was one meeting in late May before her first competition, one in June before the Elite Games started, one meeting before the Finnish Championships and one before the Finland-Sweden Athletics International competition. During each of these meetings Rautanen's goals for the season and events were reviewed and she was prompted to create and modify cue cards to suit the specific competitions. Finally, in addition to these meetings, prior to the Finnish Championships, Rautanen was given a highlight video which included footage of her best jumps of the season, images of role models and newspaper articles about her and background music of her choice.

Evaluation 2

Due to certain circumstances, a face-to-face meeting was not set up for the evaluation of the PST program. After Rautanen's last competition in September, a discussion re-

garding the program was conducted online. In addition, Rautanen wrote a report about her season and the PST program. The contents of the report will be discussed in the results chapter.

7 Results

The aim of this case study was to observe the impact of a PST program on the competitiveness of a nationally rank high jumper for elite competitions. Both quantitative and qualitative data was collected. The purpose for analysing the quantitative competition results is to answer the research question. Some qualitative data in the form of a written report was summarized to provide some insight on the success of the program from the athlete's point of view.

7.1 Competition results 2010

The competitions results for both the indoor and outdoor seasons are demonstrated in figure 5. The main difference between this graph and the one shown for the 2009 season is the addition of a new category of competitions, National Team (NT). Due to a successful season, Rautanen was given the honour of representing Finland in two international competitions. These were grouped separately from the Elite Competitions (EC) because the program was not designed to prepare the athlete for these competitions.

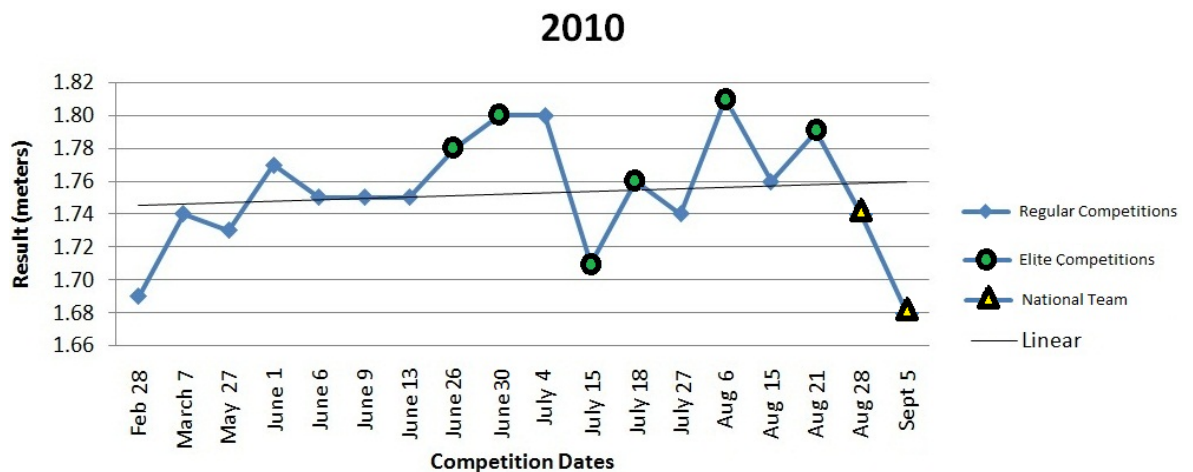


Figure 5. All of Rautanen's high jump competition results in 2010

During the 2010 competition seasons, Rautanen competed in 18 competitions, ten of which were RC, six EC and two NT representations. The first two competitions were part of the indoor season and the other 16 competitions were a part of the outdoor season. The linear trendline represents the progression of the average throughout the competitions. The best result of the season was 1.81m, which was also her new per-

sonal best, the lowest result was 1.68m and the season average was 1.75m (rounded down from 1.752). In addition, Rautanen equalled her indoor personal best of 1.74m.

7.2 Comparison of the 2009 and 2010 seasons

The results of the Elite Competitions for the 2009 and 2010 outdoor seasons are depicted in figure 6. The Elite Games (EG) competitions, Finnish Championships (FC) and the averages of these competitions for both years are represented. For both seasons there were five Elite Games however, Rautanen only competed in four of them in 2009 due to scheduling conflicts. In addition, the indoor FC competition has been excluded since Rautanen was unable to compete in 2010 due to her ankle injury.

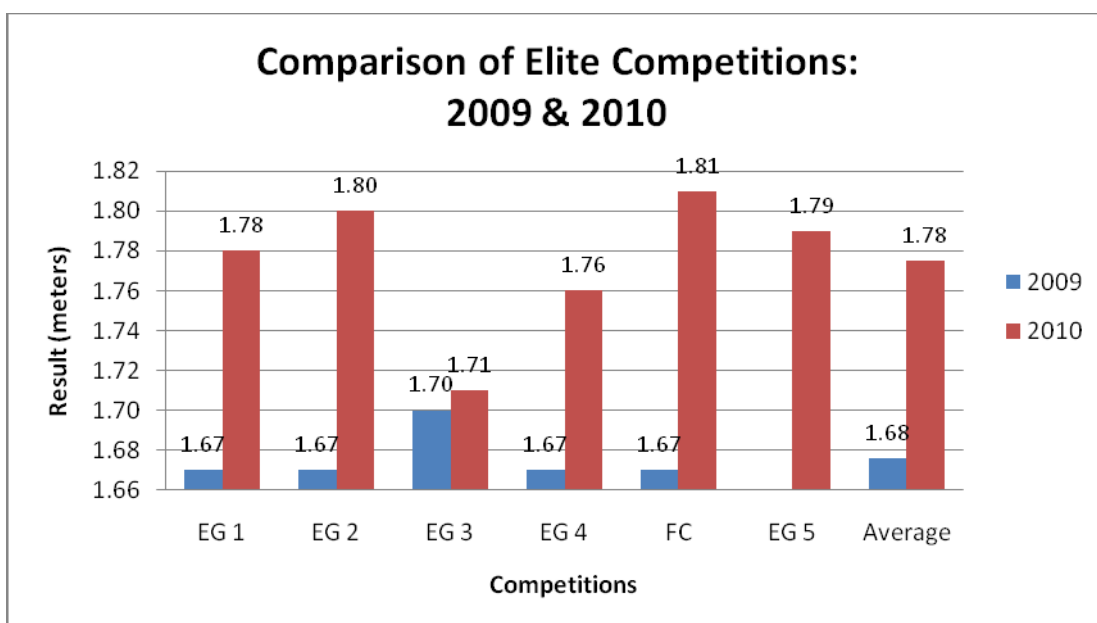


Figure 6. A comparison of the 2009 and 2010 elite competition (EC) results which include the Elite Games League (EG) and Finnish Championships (FC)

The T-test for repeated measurements is one of the most commonly used parametric tests to demonstrate if the differences between two sets of data are statistically significant (Nummenmaa 2004, 164). The average of the 2009 EC results was 1.68m with a standard deviation of 0.0134 and the average of the 2010 EC results was 1.78m with a standard deviation of 0.0361. Visually there appears to be a clear difference in the results from 2009 and 2010 and this is also supported by the numbers as the average result increase of 10cm is a statistically significant change ($p= 0.0143$).

7.3 PST program evaluation

The following text is a summary of a free-form written evaluation report completed by the athlete on the 14th of September 2010. The report has not been attached to this thesis due to a request from the athlete.

The athlete provided an overall rating of 8.5 out of a possible 10 for the program. Rautanen felt as though the intervention was a success and that there were many positives and several improvements. In addition to these insights, the athlete also discussed some of her personal struggles during this process.

First, Rautanen truly enjoyed this learning experience for several reasons. She learned about the important cues to focus on both during practice and in competitions. She was surprised by the amount of research that had been done in the field of sports psychology and found some studies helpful as they provided answers to some queries. She also mentions that this season may have felt more mentally draining, but sees this as a positive because she believes she was able to get more out of herself. Finally, she enjoyed the positive support and the researcher's presence at competitions and the post-competition analysis interviews and reports.

At the start of the program she had trouble getting in the routine of performing mental skill practices often and on a regular basis. However towards the end of the program she began to feel almost addicted to them because she attributed the success of her season to the PST program. One reason for the slow start could have been from the lack to being told in detail all the benefits of the tasks, instead she was doing them because she was told to do them.

Next she suggests some improvements. The lack of the training diary at the start was something that really bothered Rautanen, and she really enjoyed it when she was finally given clear schedules and a training log. In addition, she wants more variety in terms exercises and tasks. She recommends that I communicate more with her coaches so that they can become more involved in this process and the mental side would be incorporated better with her physical and technical training.

8 Discussion

The aim of this case study was to investigate the impact of a psychological skills training program on the competitiveness of a nationally ranked high jumper in elite competitions. These findings can be used to then evaluate the effectiveness of the PST program and the entire intervention in general.

8.1 Quantitative results review

The results of the study demonstrated that the use of this particular psychological skills training program may have led to an increase in the athlete's competitiveness in elite competitions. The research question for this study was: Does the use of a structured PST program lead to an increase in competitiveness in elite games for this particular athlete? A simple answer based upon the statistically significant increase in performance results is "yes". However, there are many factors other than the program which could have led to the result increases. These include possible technical improvements or the increase sport-specific muscle strength. To better account for the contributions of these factors, physical tests and technical analyses could have also been compared.

One difference between the two sets of data which does indicate that the PST program did in fact have a positive influence is shown in the differences between the averages of the EC in comparison to the RC for the two seasons. In 2009, the average result of all EC was 1.67m which is 4 centimetres below the average of all the RC which was 1.71m. Conversely in 2010, the average result of all EC was 1.78m, which is 3 centimeters above the average of all the RC which was 1.75m. This suggests that Rautanen was better prepared for the more important competitions in 2010 than in 2009, when she underperformed based on her skill level at the time. In addition, past research regarding the effectiveness PST supports that these types of interventions lead to performance increases, thus it is a valid claim to say that this program did contribute to the increases in performance for this particular athlete, but how much it contributed remains unknown.

Overall, the results were rather surprising as they went beyond the expectations of the hypothesis in which it was inferred that following the intervention, the EC results would be at the same level as the RC result. Instead, on average, Rautanen performed better in EC than she did in RC.

8.2 PST program review

I have found the process of implementing this psychological skills training program to be a very rewarding experience. Looking back at it, it is clear that while it was successful, there is still plenty of room for improvement.

The methods for scheduling tasks were fairly irregular and not very interactive. During the practice phases I had the habit of suggesting various techniques and exercises for the week during phone calls or text messages. In addition, my follow-up on some tasks could have been more frequent. As mentioned in the first evaluation phase, Rautanen complained about the lack of scheduled practices and a training log as she did not always complete the tasks because nothing was written down. This was a fairly large issue because these skills need to be practiced often to produce the most effective results. Following this, a training log was introduced and I got into the habit of sending her a weekly email with day-specific exercises for the upcoming week. This did increase the adherence to the tasks. Despite these changes, I never followed-up on what she wrote in the training logs until after the season was over so I missed out on some aspects of her practices. In the future, I will be sure to take a more active approach to the training log.

Another factor which I seemed to overlook was the need to test the athlete's abilities in different mental skills. While I know that mental skills should be treated like physical skills, it did not occur to me to test the participant at the start of this intervention and to make these tests regular to view her progression. I did conduct interviews and made observations to explore the level of her skills, but only using these subjective methods has several limitations which includes subjective bias. More objective tests could have included the Test of Attentional and Interpersonal Style, and Test of Performance Strategies. (Weinberg & Gould 2007, 264.)

A third limitation with the program was that relaxation techniques were only introduced mid-way. I possibly overlooked this mistake at the start, simply because the athlete had not reported issues with muscle tension during her worst events. The importance of relaxation skills is clear because it allows for the athlete to control anxiety during high pressure situations (Kornspan 2009, 47). Ideally these techniques should have been introduced at the start as it can take several months to learn a simple breathing technique.

From my personal point of view, probably the best aspect of the design of the program was the addition of the evaluation phase mid-way through the program. This is one aspect which is often overlooked in PST programs (Weinberg & Gould 2007, 267). To me this seems like a crucial mistake as the feedback I received from this evaluation phase could have made all the difference in the success of the program. Prior to the evaluation phase I had not taught any relaxation skills, and not all skills were practiced regularly due to the lack of a training log. It is very possible that these gaps in the program could have otherwise gone unnoticed until the very end of the intervention.

On the whole, it appears as though the program was a success due to the overall satisfaction and positive performance results of the athlete. This process has also fuelled my personal motivation to continue working with this athlete and improving the overall collaboration.

8.3 Practical implications

This study aimed to provide information regarding the use of a PST program to improve performance for the coaches, and the athlete. The findings of this study suggest that the effects of PST were positive, and have provided a better understanding of the athlete in general. I believe this study was beneficial to all parties involved because brought greater attention to the importance mental side of high jump, when in the past almost all of the focus has been put on the physical and technical aspects of the sport. While the coaches and athlete were all aware of PST prior to the intervention, nothing had ever been implemented in a structured manner and this study provided a great platform to bring attention to how this is done.

In the larger picture, the practical implications of this study are fairly limited as the case is based upon one particular individual. However, it has provided me with a great learning experience in applied sports psychology. I now have a much better understanding of how the theory of sports psychology can be effectively applied for a competitive athlete.

8.4 Future directions

Future directions for this study would be to continue working with the athlete and aid in preparations for future competitions. This first program can be used as a foundation for the future program as it has provided many insights. Since the athlete is now at a different point in her career than when we started the intervention, the focus of the following interventions need to change. Some areas which need to be considered for the new program would be the influence of expectations on performance. Following this successful season, Rautanen had mentioned some concerns of living up to the expectations of herself and others in the following season. In addition, another focus should be on preparations for the National Team competitions. The ultimate goal of these programs would be self-regulation. Another consideration would be to increase the involvement of the coaches in this process as their competitive background and sport-specific knowledge are great resources which were only minimally explored during this intervention.

Since it was rather difficult to find any PST intervention studies related to high jump, a topic for future research would be to conduct PST programs for a larger group of high jumpers. In addition, to the larger participant number, the other variables such as technical skills and physiological changes should be taken into account. Moreover, this study should also include tests for the different mental skills, so that progress on this front becomes more tangible.

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Attachments

Attachment 1. Transcript for progressive relaxation

Instructions for Progressive Relaxation

In each step you'll first tense a muscle group and then relax it. Pay close attention to how it feels to be relaxed as opposed to tense. Each phase should take about 5 to 7 seconds. For each muscle group, perform each exercise twice before progressing to the next group. As you gain skill, you can omit the tension phase and focus just on relaxation. It is usually a good idea to record the following instructions on tape; you might even invest a few dollars in buying a progressive relaxation recording.

1. Find a quiet place, dim the lights, and lie down in a comfortable position with your legs uncrossed. Loosen tight clothing. Take a deep breath, let it out slowly, and relax.

2. Raise your arms, extend them in front of you, and make a tight fist with each hand. Notice the uncomfortable tension in your hands and fingers. Hold that tension for 5 seconds; then let go halfway and hold for an additional 5 seconds. Let your hands relax completely. Notice how the tension and discomfort drain from your hands, replaced by comfort and relaxation. Focus on the contrast between the tension you felt and the relaxation you now feel. Concentrate on relaxing your hands completely for 10 to 15 seconds.

3. Tense your upper arms tightly for 5 seconds and focus on the tension. Let the tension out halfway and hold for an additional 5 seconds, again focusing on the tension. Now relax your upper arms completely for 10 to 15 seconds and focus on the developing relaxation. Let your arms rest limply at your sides.

4. Curl your toes as tight as you can. After 5 seconds, relax the toes halfway and hold for an additional 5 seconds. Now relax your toes completely and focus on the spreading relaxation. Continue relaxing your toes for 10 to 15 seconds.

5. Point your toes away from you and tense your feet and calves. Hold the tension hard for 5 seconds; then let it out halfway for another 5 seconds. Relax your feet and calves completely for 10 to 15 seconds.

6. Extend your legs, raising them about 6 inches off the floor, and tense your thigh muscles. Hold the tension for 5 seconds, let it out halfway, and hold for another 5 seconds before relaxing your thighs completely. Concentrate on your feet, calves, and thighs for 30 seconds.

7. Tense your stomach muscles as tight as you can for 5 seconds, concentrating on the tension. Let the ten-

sion out halfway and hold for an additional 5 seconds before relaxing your stomach muscles completely. Focus on the spreading relaxation until your stomach muscles are completely relaxed.

8. To tighten your chest and shoulder muscles, press the palms of your hands together and push. Hold for 5 seconds; then let go halfway and hold for another 5 seconds. Now relax the muscles and concentrate on the relaxation until your muscles are completely loose and relaxed. Concentrate also on the muscle groups that have been previously relaxed.

9. Push your back to the floor as hard as you can and tense your back muscles. Let the tension out halfway after 5 seconds, hold the reduced tension, and focus on it for another 5 seconds. Relax your back and shoulder muscles completely, focusing on the relaxation spreading over the area.

10. Keeping your torso, arms, and legs relaxed, tense your neck muscles by bringing your head forward until your chin digs into your chest. Hold for 5 seconds, release the tension halfway and hold for another 5 seconds, and then relax your neck completely. Allow your head to hang comfortably while you focus on the relaxation developing in your neck muscles.

11. Clench your teeth and feel the tension in the muscles of your jaw. After 5 seconds, let the tension out halfway and hold for 5 seconds before relaxing. Let your mouth and facial muscles relax completely, with your lips slightly parted. Concentrate on totally relaxing these muscles for 10 to 15 seconds.

12. Wrinkle your forehead and scalp as tight as you can, hold for 5 seconds, and then release halfway and hold for another 5 seconds. Relax your scalp and forehead completely, focusing on the feeling of relaxation and contrasting it with the earlier tension. Concentrate for about a minute on relaxing all of the muscles of your body.

13. Cue-controlled relaxation is the final goal of progressive relaxation. Breathing can serve as the impetus and cue for effective relaxation. Take a series of short inhalations, about one per second, until your chest is filled. Hold for 5 seconds; then exhale slowly for 10 seconds while thinking to yourself the word "Relax" or "Calm." Repeat the process at least five times, each time striving to deepen the state of relaxation that you're experiencing.

Exercises for Improving Concentration

E1. Learning to Shift Attention

1. Pay attention to what you hear. Take each separate sound and label it. Next, listen to all the sounds around you without attempting to label them. Listen to the blend of sounds as if it were music.
2. Now become aware of body sensations. The feeling of the chair, or bed supporting you. Label each sensation as you notice it. Before moving on to the next one, let each sensation linger for a moment- consider its quality and source.
3. Thoughts and emotions. Let each emotion or thought simply arise; do not try to specifically think about anything. Remain relaxed and at ease, no matter what you are thinking or feeling. Now try to experience each of your feelings and thoughts one at a time. Finally, see if you can just let go of all these thoughts and emotions and relax.
4. Open your eyes and pick an object across the room and directly in front of you. While looking straight ahead, see as much of the room and as many objects there as your peripheral vision allows. Now try to narrow your focus of attention to just the object centered in front of you. Now expand your focus little by little, widening your perspective until you can again see everything in the room. Think of your external focus as a zoom lens; practice zooming in and out.

E2. Parking Thoughts

Negative thoughts are “parked” into a safe and nondistracting place until after a performance. Parking is typically accomplished by some form of self-talk or visualization. When a thought has been “parked”, you can continue to compete without that distracting thought. The idea is to deal with it later.

E3. Learning to Maintain Focus

Find a quiet place with no distractions. Choose an object to focus on. Hold it in your hands. Get a good sense of how it feels, its texture, color, and any other distinguishing characteristics. Now put it down and focus your attention on it, examining it in great detail. If your thoughts wander, bring your attention back to the object. Record how long you can maintain your focus on the object. It isn't easy to stay focused on one object. Once you are able to maintain focus for at least 5 minutes, start practicing with distractions present. Record all of your times.

E4. Searching for Relevant Cues (Grid)

Start at 00 and find as many numbers in order on the grid within 60 seconds. Practice this with and without distractions. Record all your results.

E5. Rehearsing Game Concentration

Picture yourself completing at least 10 jumps from various heights in a competition. Only visualize successful jumps. You can't do what you can't imagine, so practice seeing success and it will occur.

E6. Distraction Training

Add distractions to your training sessions. This includes trash talking or taunting, physical intimidation (spitting, pinching), environmental conditions, or internal distracters (anxiety, regrets, worries about evaluation).

Techniques for improving Self-Talk

6 rules:

1. Keep your phrases short and specific
2. Use the first person and present tense (minä)
3. Construct positive phrases
4. Say your phrases with meaning and attention
5. Speak kindly to yourself
6. Repeat phrases often

Thought Stopping

Create a trigger to stop negative thoughts. It can be an image (STOP sign), a word or an action.

Changing Negative to Positive

Think of a positive substitute for your negative statements. Ex. "I never jump well when it's windy" → "It's windy for everyone. This just requires extra concentration."

Techniques for Improving Concentration (on site)

1. Use Simulations in Practice

Try to make a practice more like a competition. Only give yourself three attempts at one height. Add different distractions into your practice. Train in different weather conditions... etc.

2. Use Cue Words

The aim is for a single word (or a couple) to trigger a certain response. They should be instructional or motivational to help focus on the task. Ex. "Explode" before a jump to try and really jump up with power.

3. Use Nonjudgemental Thinking

Do not judge a performance as good or bad. Instead look at it objectively.

4. Establish Routines and Competition Plans

The routine should be done right before a jump, and should also be used in practice. Competition plans should be made to direct focus during a competition.

5. Eye control

Be aware of where you look. Try to look at things which are relevant to the task.

Avoid looking at irrelevant actions (movement in the crowd, other competitors etc.)

Relaxation Techniques

1. Progressive Relaxation

Listen to the recording in a quiet place with no distractions.

2. Breath Control

Take a deep, complete breath, and imagine that the lungs are divided into three levels.

Focus on filling the lower level of the lungs with air, first by pushing the diaphragm down and forcing the abdomen out. Then fill the middle portion by expanding the chest cavity and raising the rib cage. Finally, fill the upper level by raising the chest and shoulders slightly.

Hold this breath for several seconds and then exhale slowly by pulling the abdomen in and lowering the shoulders and chest. Inhale for 4 counts and exhale for 8 counts.

3. Relaxation Response

Find a quiet place and a comfortable position (do not lie down). Focus your attention on a single thought or word and repeat it over and over. Choose a word such as “rauha” or “rento”. Every time you exhale, repeat the word. You have to learn to let it happen, allowing the thoughts and images that enter your mind to move through as they will, making no attempt to attend to them. If something comes to mind, let it go and refocus on your word. Try to practice for about 10-20mins a day.