4.2 Visualization and Imagined Practice

Introduction

In this unit, we will look at strategies for psychological training that have been very prominent in the training world in recent years. Visualization and mindfulness are important to high athletic performance sports due to their usefulness as methods of mental control.

Both practices offer a new perspective on what is understood as behavior and how to manage emotional states. They are not passing fads. Rather, they are theoretical entities, backed by scientific research, that have begun to find their place in sports, with the foundation for their application with potential improvements in athletic performance.

Coaches and psychologists dedicated to high performance work with athletes are searching for ways to improve and the resources to do so. On the psychological side, the main objective is to identify strategies for managing the interferences that encroach upon the subject during competition and training. The goal is to understand the subject, the sport they practice and find the psychological variables that affect their personality profile based on the characteristics of the sport.

Every intervention on the part of the sports psychologist should have a clear objective with the purpose of improving a specific skill in the athlete. Working on visualization or mindfulness in sports requires previous study of both practices. In this case, we will provide the theoretical-practical support tools to begin to introduce the framework of these techniques and how to apply them in the sports field. The objective is to provide the athlete with the possibility of improving their athletic performance.

In summary, before applying new intervention strategies, we must first: understand the complex dynamics of the sport being practiced; know the history of the athlete and their relationship with psychological interventions; analyze the work team in charge of training the athlete and their relationship (experience) with areas such as sports psychology; and meet the parents and work with them to be a support outside of the athletic institution. When

applying something new, and even more so if it is a psychological intervention, it should be understood that the at first it may seem more difficult than it's worth. Even though psychological interventions have begun to be applied in athletic institutions, such interventions are not yet common across all sporting contexts. Athletic coaches often believe they are best placed to understand what their athletes need. With that, it often takes twice the work to develop intervention strategies appropriately.

The sports psychologist may meet resistance when trying to implement a visualization task or techniques such as mindfulness, not only because they are new, but also because of the way they are implemented.

4.2.1 Visualization

There are several strategies that athletes can use in regards to mental control. In this case, we are discussing visualization or imagery as a resource for mental psychological training.

Visualization deals with the creation of an experience in the mind, retrieving segments of information from the memory that can be stored to create images that represent something. It is experienced internally and generates a product in the memory in the form of a recollection of a past experience or event.

It can also be said, more specifically, that it deals with a form of simulation. It is implies living an imagined experience, as if it were real. Visualization to recreate an experience is a resource utilized by a large number of the wider population. Many times, in order to experience an emotion, and feel something that we have felt before, we turn to our imagination. In this case, it is about having the ability to imagine and visualize productive potential to be applied to sports.

The mind has the ability to create events that have not yet happened. Even though visualization uses the memory, it can also be used to prepare for potential experiences based on fragments.

Using the senses

When discussing visualization, all the available senses should be put into play to create a high level of meaning and mental representation. Smell,

touch, hearing, and the kinesthetic system should be present when visualizing. The senses generate a feeling of being in a place and, particularly with kinesthetics, they generate the possibility of going through the movements as if they were really happening, since tendons, muscles, and joints are involved.

The majority of athletes that find success in their discipline utilize visualization as a training resource. Few athletes can give a detailed explanation of its application, but some are able to. Jack Nicklaus, one of the world's best golfers, talks about visualization in the following way:

> "I never hit a shot, not even in practice, without having a very sharp, in-focus picture of it in my head. It is truly like a color film. I see the ball where I want it to end up. Then I see the ball reaching its destination. Then I see myself making the kind of swing that will turn the previous images into reality" (Nicklaus, 1974).

Visualization is a cognitive intervention. Vealey and Greenleaf (2001) define visualization as creating a mental experience with the senses. That can be summarized as:

- A mental image can be created without the presence of external stimuli.
- An image may be created using one or all of the senses.
- Images are created using the information stored in the working memory or long-term memory.

Block (1981) holds that visualization is one of the greatest resources in cognitive science. Based on this, two interesting theories have been developed that we will present. The first maintains that mental imagination is a product of images that already exist in the brain. The created images are as real as those that we see. The second theory considers that such mental images do not exist, and when a scene is imagined in the mind, it is not really an internal image. It is, rather, a result of the vivid nature of language, generating what is seen as a real image created by the mind. Thoughts create an image that is so real we think we see it.

Regardless of the theoretical explanations, mental images seem real to the subject. Imagery is considered the language of the brain. Fisher (1986) holds

that the brain does not differentiate between a real or imagined image based on the same event. For this reason, the act of working with athletes through visualization, motor skills, or experiences is worthwhile. In a study published by Hale and Whitehouse (1998), completed with professional soccer players, it was concluded that visualization and, thus, the images observed, influence emotions and athletic performance.

4.2.2 Visualization and Sports

Imagery is understood as a cognitive process applied to improve athletic performance and learn motor skills. It is a practice that should be developed alongside the practice of athletic skills and as a complement to them. It is recommended that athletes dedicate a portion of their time to practicing visualization for the execution of certain skills. These visualization practices should first be applied to athletic training.

In terms of improved performance, the benefits can be seen in:

- The athlete's skill level: in a study by Fletz and Landers (1983), visualization was seen to benefit experienced athletes more than those with less experience. This can be related specifically with the quantity of experience accumulated. The greater the motor repertoire in the memory, the easier it will be to evoke images related to the movement. An athlete with little experience does not have the quantity of motor resources to be able to imagine movements. In order for visualization to assist with athletic performance, an experience base is needed. The more skills an athlete has mastered, the more useful they will find visualization.
- Cognitive component of ability: this refers to the usefulness of mental practice in those tasks that require previous planning. Motor skills are differentiated by the quantity of information processing that each one requires. The more complex the motor activity, the more useful it will be to apply visualization. This reduces the level of difficulty when executing said task.
- Time and practice: mental practice is more effective if it precedes motor skills practice. It is suggested that visualization or mental practice does not exceed three minutes.

Like every practice that appears and emerges in the world of athletic training, it is accompanied by a theoretical framework that lays a foundation

for its applicability. Next, the theories that validate the practice of visualization will be described in detail.

We should ask the following question: How is it possible that imagining a movement before doing it can improve the subject's performance? This is what many sports psychologists ask themselves and what these theories try to answer.

Psychoneuromuscular Theory

This theory states that visualization generates neuromuscular patterns with great similarity to the patterns in actual practice. The brain sends messages to the muscles related to the imagined movements; the muscle doesn't move, but the brain generates the same nerve connections. The neuromuscular system puts the movement patterns into practice without the movement actually happening.

During visualization, electrical activity is detected in the muscles involved in the imagination, according to Smith and Collins (2004). The psychoneuromuscular theory best explains the relationship between visualization and improved performance.

Symbolic Learning Theory

In this case, the benefits of visualization are attributed to the fact that the movements are imagined before they are carried out. Prior planning and anticipation decreases the margin of error. With athletic movements, previously imagining the entire motor sequence – with set objectives and possible alternatives – improves the result and, therefore, the performance. This theory recommends prior familiarization with the motor skill to be developed. The mental plan of the movement must be detailed for it to be executed successfully. Motor skills require motor and cognitive components; when dealing with the visualization of a cognitive component, this resource is an extremely useful complement to training.

Theory of establishing attention and arousal

In this theory, cognitive and physiological variables are combined. The cognitive level deals with sequencing and previous planning of the task to

be executed; the physiological level deals with arousal and recruitment of electrical activity from the brain to the muscles.

From its practical application and with the objective of improving performance, it is recommended that it is used in conjunction with both variables.

Conceptual models

Paivo (1985) states that visualization has a cognitive and motivational objective. With regards to the former, and as previously mentioned, it is the act of planning the skill before carrying it out. The motivational objective refers to experiencing a feeling of success once the task has been carried out, from which the athlete gets the initial energy for the task.

Martin, Morits and Hall (1999) suggest five types of visualization:

- Specific motivation: the athlete imagines themselves in a very motivating moment or in a special situation. It could be winning a match after a crucial moment.
- General-refinement motivation: the athlete imagines themselves showing off their motor skills. It could be thinking positively every time they are going to execute a penalty shot.
- General-arousal motivation: the athlete imagines themselves with mastery and control over their anxiety levels.
- Cognitive specific: the athlete imagines themselves completing a motor skill correctly.
- Cognitive general: the athlete imagines themselves reviewing the actions that are to be completed.

The six questions for visualization:

Where and when: Athletes use visualization in competition or training. In competitions, it is done before, during, and afterwards. Usually, prior visualization through mental practice is most common.

Use and function: In this case, it is hoped that visualization generates the desired results. The athlete should put visualization to use both cognitively and motivationally. The relationship between visualization and improved performance will be related to the quantity of information that is provided to

the athlete during this type of training. It not only improves performance as a product of anticipating the action, but also helps with pre-competition anxiety and stress.

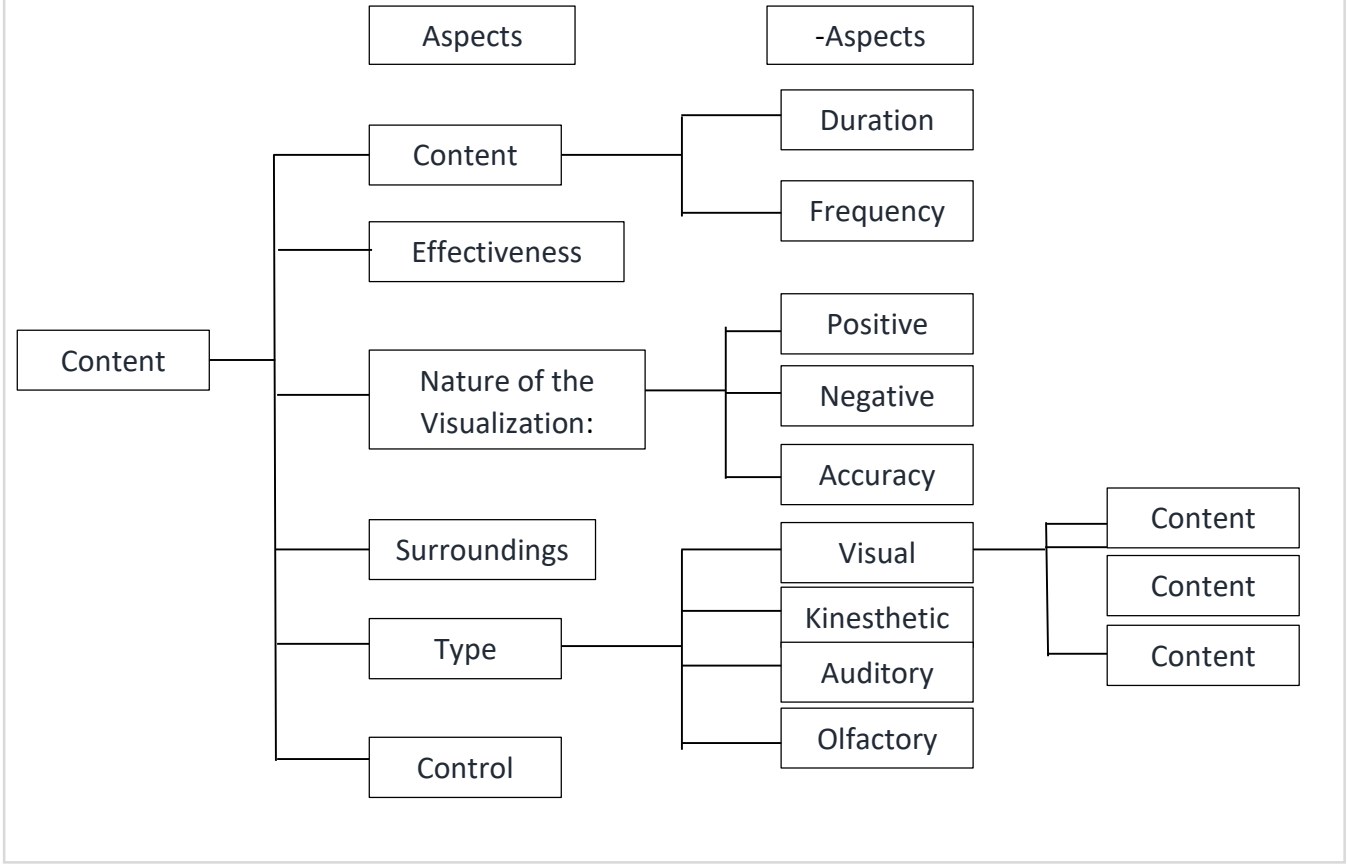
Content and quality: considers that visualization can be presented as facilitating or weakening performance, based on the "what" of what is visualized. In relation to this, Ram and McCullagh (2003) looked at two modalities:

- Using writing in the visualization of a successful movement.
- Observing a video of themselves carrying out a successful motor action.

By applying these two variables, it was concluded that observing the video had better results for sports practice. Observing one's self via video is referred to as self-modeling.

In the following table, the content of visualization is presented along with the different aspects and specific divisions, with the intention of clarifying the "why" of visualization.

Figure 3: Visualization content



Source: Munroe, K.J., Giacobbi, P.R. Jr., Hall, C., & Weinberg, R. (2000). Retrieved from Cox (2009). Psicología del deporte. Conceptos y sus aplicaciones. 6th Edition. Ed, Panamericana.

To investigate whether visualization benefits athletic performance, the researchers divided results into three different types: athletes' anecdotes, case studies, and scientific experiments.

In the case of anecdotes, there is no validity without scientific evidence. It can be said that many athletes use visualization strategies, and many agree that the tool improves their performance.

In regard to case studies, applying longitudinal follow-ups, it can be demonstrated that visualization directly contributes to an improvement in performance. In one case study with three basketball players, they underwent visual training programs to improve their free throw shots in stressful situations. They demonstrated improvement in performance: two

players by 11% and the third by 15%. They experienced a loss of concentration in the moments before the shot, because of the crowd. In this case, there were improvements in performance with visualization programs. Experimental tests have greater scientific impact. There are studies that show the applicability of visualization in different athletic disciplines such as golf, basketball, tennis, skiing, etc. There are two variables which show that visualization techniques can improve performance: the characteristics of the task and the athlete's motor skill level. Tasks that demand a cognitive component (decision-making) benefit from previous training with visualization techniques. Through mental training, a review of the possible situations that will need to be resolved is completed, thus anticipating their execution. Based on the experience of the athlete, the experimental tests can have positive results in the application of visualization techniques for athletes with little experience, as well as with experienced athletes. An evaluation must be made in this respect: in the case of athletes with little experience, visualization contributes to the act of imagining how they would like to complete a task and imagining themselves doing it with the correct movements. With expert athletes, visualization techniques help improve technique and decision-making. Nevertheless, as previously mentioned, an experienced athlete has a greater repertoire of motor skills, which means that their motor programs are more developed.

4.2.3 Skills for Working on Visualization

Trainings oriented toward working on visualization must employ certain initial conditions in order to be effective. Before beginning specific visualizations for a sport, doing other types of interventions is suggested as a warm-up:

- Work in places that are comfortable and calm. Optimal relaxation states should be reached before beginning.
- Visualize a house – it could be your own house – and begin to describe in detail what's inside it: sounds, colors, textures, smells, decorations, etc. Maximize the senses.
- Imagine a three-dimensional glass which is filled with liquid. Then, add ice and write a descriptive phrase below it.
- Practice imagining a colorful circle that occupies your entire field of vision and which shrinks progressively until it disappears.
- Choose a certain number of scenes and then visualize each one in detail. The scenes can be related to the sport you practice.

- Visualize a person while completing a skill; then be the one executing the same task.
- Visualize a skill being done correctly. Choose a skill for the sport you practice and imagine yourself completing it perfectly a minimum of 20 times, maintaining the technical details.
- Control your abilities. Visualize a skill with mistakes. Observe the errors and then imagine executing it correctly. Mastering control is being able to visualize a skill executed correctly and incorrectly.
- End the task with a deep breath, and begin to adjust to the environment again.

Skills gained:

- Developing concentration. By working on skills that are carried out later, visualization allows you to focus on the task.
- Generating confidence. It allows you to mentally practice an ability and lower anxiety levels when completing it.
- Stabilizing emotions. Visualization is the anticipation of an act. If a certain situation generates anger, for example, this can be eased if it is anticipated in the training sessions.
- Improves athletic skills. It allows for the tasks and technical details associated with a complex skill to be mentally reviewed. Visualization of the correct execution stimulates motor patterns, and generates nerve connections for new movements.
- Improving the application of game strategies. Visualization allows us to work on individual or team objectives and practice what the coach expects for a particular competition.

To develop this ability, the athlete should work on and train that particular objective in order to refine in detail what they are hoping to achieve. Athletes that are able to master this ability use all their senses and the images they visualize are detailed. They are able to create images with a high level of reality, which makes them easier to transfer to real life practice.

During visualization training, in addition to what was already mentioned, the characteristics of the environment where the athlete is going to compete or train must be described. Details should be gathered in regards to: the crowd, dimensions of the space and playing area, emotions that they tend to be experienced in those situations, anxiety and thoughts that are generated in

competitive contexts, etc. With this, more tools are available to refine visualization.

Another ability that should be developed in visualization training is being able to manipulate the images. For some athletes, controlling the image is difficult, and when they are visualizing, they see themselves repeating errors.

From here, we will look at another technique which is emerging in sports psychology.

4.2.4 Mindfulness

Kabat-Zinn (1990) defines mindfulness as the ability to voluntarily become aware and pay attention to what is happening in the moment, and to the way it appears, without making value judgments or reacting. It means to respect what is happening, while it happens, and how it happens. It can also be defined as attention or complete awareness. This term is of Buddhist origin and was introduced to the West by Jon Kabat-Zinn.

According to this author, when completing mindfulness tasks, several characteristics should come together:

- Do not make initial judgments: abandon any judgment you have about what is happening at the time it is happening.
- Patience: allow reality to manifest in due time and live it like it is.
- Beginner's mentality: every moment should be lived as if it were the first.
- Confidence: in oneself and in what you are capable of.
- Do not fight or compete: put aside expecting to change what happens and what could occur.
- Acceptance: see reality as it is, without the necessarily enjoying it.
- Allowing it to happen: the practice of detachment.

In the words of Germer, Siegel and Fulton (2005), complete attention should be understood as a theoretical construct that encompasses all attempts to define the term mindfulness and its components. It is used in a meditative way as a practice for developing complete attention, working on breathing awareness and consciousness of internal processes. It is also a

psychological process that allows us to work with cognitive and emotional questions in order to respond efficiently to stressful situations.

Sanz (2009) summarizes the benefits of incorporating mindfulness in a person's life:

- Increases concentration, resulting in decreased distraction.
- Improves self-awareness.
- Decreases suffering.
- Improves psychological, physical, and immune system well-being.
- Contributes to relaxing the body and mind.
- Matures a commitment to take care of personal health.

Mindfulness and athletic performance

This new trend that is gaining popularity in sports psychology is founded on a new paradigm with respect to variables such as: control over thoughts, self-talk, visualization, control of arousal, etc. It proposes that, while these correspond to favorable results in terms of optimizing performance, they pose an energy expenditure because the athlete is permanently evaluating their emotional state to assess which psychological strategy to use for stabilizing those emotions. In mindfulness, reality is simply lived and experienced, stripping the athlete of previous judgments and thus helping them to live their experiences. This technique does not try to eliminate, for example, a negative thought. Rather, it teaches us to accept the thought in a radical way. It abandons fighting and control, adopting a contemplative position. In summary, it is the art of accepting the experience instead of fighting against it.

Jon Kabat-Zinn (2007) developed a training program known as Mindfulness-Based Stress Reduction (MBSR). The techniques used in this program are:

- The raisin exercise: this consists of tasting slowly and consciously, using all the senses while you eat.
- Complete attention on breathing: begin with ten minutes. Over time, you can reach twenty-five minutes. The athlete first focuses on their breathing, then on their body, and finally on the environment. The task is progressive.

- Observing body sensations: through different chants, the athlete should pay attention to different parts of the body sequentially from the feet to the head.
- Yoga: use several yoga exercises so that the athlete can focus on their mind and body while they move.
- Meditate while walking: reach a state of awareness while the athlete walks, with the intention of perceiving sounds and stimuli in the environment.
- Complete attention on daily life routines: eating, driving, walking, getting dressed.

Another technique (Franco, 2009) used in mindfulness training is called flow meditation. This technique consists of stopping the attempt to control thoughts and change them; on the contrary, the idea is to be free and open to any thought, feeling, or emotion that comes up spontaneously.

The meditation flow technique incorporates the use of a three-syllable word with the emphasis on the last syllable (any word), which should be said mentally and gently, while attention is directed to the abdominal area to identify how air enters and leaves the body. The use of this technique contributes to improved athletic performance by positively influencing anxiety, depression, chronic stress, hypertension, and fibromyalgia; it reduces athletic burnout and improves the athlete's resilience.

Another well-known technique with much application in the athletic training world is Mindfulness-Acceptance-Commitment (MAC). This technique consists of increasing awareness of the present and concentration on the task to be completed. It promotes the execution of motor skills and is composed of five components: psychoeducation, mindfulness, identifying values and obligations, acceptance, and integration and practice. It is closely related to flow, which is considered to be the state of fusion between action and awareness.

In athletic training, the first mindfulness interventions occurred with Olympic rowers from the United States (medal winners in Los Angeles in 1984). These athletes improved psychological variables: coping with a competitive situation, fatigue, and athletic recovery. These variables combined with an improved performance to obtain a medal in the Los Angeles games.

As previously mentioned, the goal of the mindfulness technique is not to oppress thoughts, feelings, or emotions. Rather, it is to let them appear and experience them as temporary events. The subject learns to observe their emotions and go beyond what is happening. In letting emotional states and thoughts happen, the subject stops assigning identities to them and begins to treat them as brief and passing. It is a different way to relate and react, where they don't have to reflect on the reality of the present. Within the field of applied sports training, having resources like mindfulness techniques available is a responsibility that corresponds to team psychologists and coaches.

References

Birrer, D. & Morgan, G. (2010). Psychological Skills Training as a Way to Enhance an Athlete's Performance in High Intensity Sports. *Scandinavian Journal of Medicine and Science in Sport*. Vol. 20 No. 2 [p. 78-87].

Block, N. (Ed.). (1981). *Imagery*. Cambridge: MIT Press.

Fisher, A. C. (1986). *Imagery from a Sport Psychology Perspective*.

Fletz, D. L., & Landers, D. M. (1983). The Effects of Mental Practice on Motor Skill Learning and Performance: A meta-analysis. *Journal of Sport Psychology*. Vol. 5 [pp. 25-57].

Franco, C. (2009). Efectos de un programa de meditación sobre los niveles de creatividad verbal de un grupo de alumnos/as de Bachillerato. *Suma Psicológica*. Vol. 16. [pp. 113-120].

Germer, C.K., Siegel, R.D. & Fulton, P.R. (2005). *Mindfulness and Psychotherapy*. New York: Guilford Press.

Hale, B. D., & Whitehouse, A. (1998). The Effects of Imagery-manipulated Appraisal on Intensity and Direction on Competitive Anxiety. *The Sport Psychology*. Vol. 12 [pp. 40-51].

Hanin, Y. L. (2000). *Emotions in Sport*. Human Kinetics.

Jacobson, E. (1938). *Progressive Relaxation*. University of Chicago Press.

Kabat-Zinn, J. (1990). *Full Catastrophe Living*. New York: Delacorte.

Kabat-Zinn, J. (2007). *La práctica de la atención plena*. Barcelona: Kairós.

Martin, K. A., Morits, S. E., & Hall, C. R. (1999). Imagery Use in Sport: A literature review and applied model. *The Sport Psychologist*. Vol. 18. [pp. 75-82].

Nicklaus, J. (1974). *Golf My Way*. New York: Simon & Schuster.

Paivo, A. (1985). Cognitive and Motivational Functions of Imagery in Human Performance. *Canadian Journal of Applied Sport Science*. Vol. 10 [pp. 225-285].

Pozo, A., Cortés, B., & Martín-Pastor, A. (2013). Conductancia de la piel en deportes de precisión y deportes de equipo: Estudio preliminar. *Revista de Psicología del Deporte*. Vol. 22. No. 1 [pp. 19- 28].

Raglin, J. S., & Hanin, Y.L (2000). Competitive Anxiety. In *Y. L. Hanin (Ed.) Emotions in sport* [pp.93-112]. Champaign: Human Kinetics.

Ram, N., & McCullagh, P. (2003). Self-modeling: Influence on Psychological Responses and Physical Performance. *The Sport Psychologist*. Vol. 17 [pp. 220-241].

Reeves, C. W., Nicholls, A. R., & McKenna, J. (2009). Stressors and Coping Strategies Among Early and Middle Adolescent Premier League Academy Soccer Players: Differences According to Age. *Journal of Applied Sport Psychology*. Vol. 21 [pp. 31-48].

Smith, R. E. (1999). Generalization Effects in Coping Skills Training. *Journal of Sport & Exercise Psychology*. Vol. 21 [pp. 189-204].

Smith, R. E. & Collins, D. (2004). Mental Practice, Motor Performance, and the Late CNV. *Journal of Sport and Exercise Psychology*. Vol. 26 [pp. 412-426].

Tenenbaum, G., Corbett, M., & Kitsantas, A. (2002). Biofeedback: Applications and Methodological Concerns.

Vealey, R.S. & Greenleaf, C. A. (2001). Seeing is Believing: Understanding and Using Imagery in Sport.