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MENTAL TRAINING AND IMAGERY IN SPORT

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The terms "psychological skills training", "mental training" and "mental preparation" are equivalent. These terms refer to a type of training whose purpose is to enable athletes to regularly reach ideal performance conditions by learning and developing mental skills[1].

Mental training is a psychological intervention mode that is part of the set of Sport Psychology technical tools just like "clinical sport psychology". However, mental training takes a different approach: it is essentially focused on sport context and performance optimization, and assumes an educational focus and a psychopedagogical relationship between mental trainer and athlete.

Based on the information collected during a detailed psychological evaluation – in which structural aspects (personality) and contextual aspects (sport practice, family structure and social life, school-professional project)[2] have been assessed – and according to the interest manifested by the athlete, the type of psychological activity to be developed can be defined: mental training, when the goal of the intervention is the management of competition stress and performance improvement; psychological (clinical) follow-up, if athlete's needs go beyond the scope of sport performance only. If mental training is the selected activity, the current levels of sport mental skills will have to be assessed.

A mental training program involves several sessions and comprises three main stages: learning, training and application[3]. The **learning** stage involves learning different mental training techniques – through exercises – and identifying procedures that meet an athlete's needs within each one of the psychological skills that were included in the program. In its turn, training consists of a repetition of the selected techniques, operationalization (implementation of adaptations with the purpose of improving functionality), automation and integration of procedures to training and competition routine. The **training** stage comprises the guided training (with the mental trainer present) **as well as personal training** (unassisted, carried out between two sessions of guided training). In the training stage, athlete autonomy is reinforced to enable him/her to rely on himself/herself. Last, the **application** stage refers to the use of the mental training techniques, that have been learned and practiced, in competition situations (stress contexts).

To be successful a mental training program often requires (in a preliminary stage before the learning-training-application triad) raising the athletes' awareness of emotions and physical sensations and educating them about the influence of psychological skills on sport performance.

Although often neglected, an assessment of achieved results constitutes an important element of mental training programs[4]. Qualitative and quantitative data allow us to check the effectiveness of a given program. The qualitative information is collected from the oral feedback given by athletes during the psychological interviews, while the objective data may be collected in several ways, such as: through questionnaires – like the OMSAT-3 (Ottawa Mental Skills Assessment Tool)[5]; electronic instruments (depending on the psychological skill being investigated); and information on sport efficiency coming from performance monitoring (scouting).

Single-case research design is very useful to the assessment of the effects a mental training program has on psychological variables and sport performance. This type of methodology is based on the observation of a subject in his/her own environment over a long period of time. It is characterized by the existence of two phases: the pre-intervention phase, in which the initial level of a given skill is assessed; and the intervention stage, in which a "process of change" is introduced[6].

The structure of a mental training session comprises three phases: briefing, practical session and debriefing[7]. During the **briefing** phase, athlete and mental trainer talk about the events that happened since the previous mental training session, a technique is proposed and explanations about this exercise are provided to the athlete[8]. The technique is applied during the **practical session**[9]. And, in the debriefing phase, the effects of the performed exercise are analyzed, supplementary information may be offered, and guidance on personal training is provided[10].

Among the sport mental skills that can be included in a mental training program, the following can be mentioned: **goal setting** (definition of objectives and management of thoughts and behaviors in relation to the set goals), **relaxation** (voluntary control of muscle tone decrease), activation (voluntary increase of energy when the athlete is not sufficiently psyched up for effective performance before training and competition), **positive self-talk** (thoughts or actually uttered words that boost motivation and direct behavior), **concentration** (focusing attention on relevant information and keeping this focus throughout execution of the task) and **mental imagery** (or visualization).

> *Several theories have been formulated to explain the efficacy of imagery in learning and performance in sports*

Imagery is the most popular of the psychological skills used by athletes as well as the most widely studied ability in the mental training literature[11]. Imagery can be defined as "a multisensory experience that occurs in the absence of actual perception"[12] or "using all senses to create or reproduce an experience in the mind"[13].

It is said that the soviets were the first to employ imagery in competition simulations[14]. Allegedly this occurred during the period of preparation of athletes for the Montreal Olympic Games. This tale goes on to say that pictures of the competition venues were posted on the walls of Moscow training centers with the purpose of helping the athletes to get acquainted with these venues before their departure to Canada.

Imagery comprises several areas: **acquisition, practice and refinement of specific motor skills** (mental repetitions of technical gestures, identification of problems, and correction of mistakes), **reinforcement of motivation**[15] (selection of personal goals and boosting of the efforts required to achieve them), **changes to the level of arousal and emotional states** (using mental images with the purpose of achieving relaxation or activation as well as changing mood), **increase in concentration** (focusing attention on the task to be performed, preventing the mind from wandering), **repetition of tactical strategies** (learning new strategies and repetition of collective or individual strategies), mental simulation of competition situations (analysis of possible adversities and coping strategies), increasing self-confidence (using mental images of successful behaviors in order to increase confidence), improvement of the artistic qualities of sport gestures (use of imagery to improve the artistic or aesthetic aspects of movements in certain sports such as synchronized swimming and figure skating) and **management of the healing phase for athletes who have suffered injuries** (use of mental images of: cure; pain reduction; short, medium and long term goals; and technical and tactical skills – avoiding excessive degradation of sport capacity).

Several theories have been formulated to explain the efficacy of imagery in learning and performance in sports. The **Psychoneuromuscular Theory** argues that, through slight electrical impulses deriving from the mental images, imagery produces minimal muscle activity that leaves "traces". These traces are preserved and used when the time comes to actually execute the movement[16]. The **Symbolic Learning Theory** claims that imagery acts like a coding system, helping subjects to understand and acquire movement patterns. By mentally repeating an action the subjects get familiar with the task and increase their chances of successfully performing it. In its turn, the **Bioinformational Theory** claims that mental images are a set of propositions (statements) functionally stored in the brain. Imagery scripts containing the three types of proposition – stimulus propositions, response propositions and meaning propositions – help sport performance. And, more recently, the **Functional Equivalence Theory** advances the idea that imagery uses the same neural network utilized by actual perception and motor control[17]. The modern concept of "functional equivalence" brings together characteristics of the other three theories, and claims that imagery enables athletes to prepare and plan their movements.

Imagery has two perspectives or viewpoints that may be adopted by athletes according to their personal characteristics or the type of task performed[18]. The **internal perspective or first-person perspective** happens as if the individual had a camera on his/her head, watching the activity being performed just like in real life. This is the viewpoint of the "agent"; nothing is seen outside his normal field of vision. The external perspective or third-person perspective works as if somebody (an external observer) was holding a fixed camera and the athlete sees himself/herself performing the task from an **"outside-of-body"** or **"videotape" viewpoint**[19].

The ability to visualize is determined by two fundamental attributes: **vividness** of mental images and the level of **controllability**. A mental image is vivid when it has a high level of sharpness and realism[20]. Besides the visual elements – an idea already conveyed by the word "visualization" – athletes must add to the image the kinesthetic and auditory aspects as well as the emotional states. As much as possible, mental images must look like real images. Controllability consists of the ability to manipulate the images to make them do precisely what the subject wants them to do[21].

Before anything else, in order to improve imagery skills athletes must get used to creating mental images. Initially images of objects familiar to the athlete should be used. These images should be simple and static. Later on, images of movements, and images of oneself and others will be used. During the initial phase of the work, training is provided on different types of image manipulation: switching points of observation (of an object), changes in color, size and weight (object properties), spatial manipulation (rotating an asymmetric object, such as, for example, a racket) and changes of perspective.

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