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Topographical memory and the concentration of attention in top female tennis players

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Abstract

The purpose of this study consists of analyzing the existing correlations between the topographical memory, the concentration of attention under slow and fast speed conditions and the sports performance of the top junior female tennis players. The MT and TAC computerized tests, included into the PSISELTEVA battery, developed by RQ Plus, evaluates the topographical memory and the concentration of attention, expressed through specific parameters. The subjects who took part in this study are 8 junior female tennis players, taking part of the elite of the Romanian and of the European players. Using the Spearman correlation there have been important relations highlighted between the topographical memory coefficient, the concentration of attention under fast speed conditions and the sports performance, expressed through the ranking position (the official ranking system).

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1. Main text

As a mental function, attention accompanies mental activity being the one that leads to the modelling of the nervous tonus which is compulsory in developing all the other mental processes; it appears as a background condition for the developing of knowledge processes, auto-analysis and auto-evaluation processes, as well for motor actions; it consists in orientating and concentrating of the mental activity on an object or phenomenon, thus optimizing the knowledge of a sector of the surrounding reality or of the inner, subjective life – it ensures the triggering, maintaining and optimization of the cognitive processes (Horghidan, Mitrache, & Tudos, 2001). Through

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attention we realize an important selection of the stimuli. As a property of conscience, attention implies the existence of a certain degree of focalization on a region which becomes central in relation to the rest of the ensemble, which comes to occupy a marginal position. Attention appears during the state of active standby and concurs with the optimum level of performance in a given task. Through attention: an event is perceived with a higher speed; the clarity of an object or activity grows (by increasing the conscious process); a selection of certain impressions is made (while others are more fading). Researches indicate the need of a high level of attention to obtain successful performance in sport (Hsieh, Huang, & Hung, 2010). Athletes differ at staying focused on performance and avoiding distraction. Studies (Furley, Bertrams, Englert, & Delphia, 2013) are demonstrating that an athlete's capability to focus attention relies on the situational availability of self-control strength. It is also mentioned that motor memory depends on attention's concentration capacity (Grigore, 2001). Topographical memory requires retaining for a period of time a certain route and to use this information in a predetermined purpose. Such a task includes orientation in space, focusing, cognitive efficiency, risk taking, etc. The topographical memory represents a kind of knowledge stored in the form of spatial representations (Zlate, 1999), being essential for a better adaptation to the environment. This ability to temporarily retain and manipulate information concerning the visual and spatial layout of the perceived environment is an essential cognitive process in human working memory (Pearson, Ball, & Smith, 2014). Having a special importance in the psychomotor, mental organization, in organizing the external and internal space, along with the movement memory, topographical memory is decisively influenced by the level and quality of the psychomotor stimulation in childhood, by systematically practicing physical exercises specific to various types of sports. Specialized literature (Epuran, Holdevici, & Tonita, 2001) mentions the importance of spatial memory in sports based on the understanding of the complex situation, reported to the athletes own action.

2. Organization of the research

2.1. The purpose of the research

The scope of our research was to investigate the topographical memory, expressed through some related parameters (topographical memory coefficient, the time in which the participant has executed the test, performance coefficient), the attention concentration (under slow speed conditions and under fast speed conditions) and the sports performance of the top junior female tennis players.

2.2. Subjects

A number of 8 elite female tennis players have participated at the study, aged between 14 and 16 years and having a competitive experience comprised between 5 and 8 years. The female athletes are ranked in the top 10 junior players in Romania and half of them were ranked in the top 10 players in Europe under 16 years at the end of the 2013 competitional year.

2.3. Methods

To solve the research issues, we used: observation, conversation, test – MT Test and TAC Test, within PSISELTEVA tests, elaborated by RQ Plus, statistical processing methods - SPSS and data interpreting.

2.3.1. Description and development

The MT test is conceived as a labyrinth itinerary, which offers many possibilities to move through the space between 2 points placed in the extremities of the image. The test consists in giving, in a limited time, responses based on the memorized information. Image content: a labyrinth itinerary marked with yellow arrows, a starting point placed in the left upper side of the screen marked with a red circle, an arrival point situated in the bottom right part of the screen and marked with a green circle. As response devices one can notice a desk on which there are three central buttons and a side button. Concerning the dynamics of the test, for a determined duration of time, one of the

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