

The influence of attention in increasing sports performance in football at the age of 7-10 years

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Abstract

Background. The concept of uniform training of children and juniors in football is a requirement that has been increasingly expressed by many technicians. The improvement of distributive attention and focused attention plays an important role in increasing sports performance.

Aims. The study aims to examine the relationship between attention and sports performance.

Methods. Attention was assessed using two testers: the EM – 05.48 C focused attention tester and the combined EM – 05.54, EM 05.55 distributive attention tester.

Results. Following the tests applied, it was found that football players' performance increased after the training program. Distributive attention registered the following results: the number of correct reactions at the final testing increased by an average of 1.26. The means were 130.27 at the initial testing and 131.53 at the final testing, with a percent increase of 1.0%. The number of erroneous reactions at the final testing decreased by an average of 1.66, the mean values being 5.13 at the initial testing and 3.47 at the final testing. The mean performance at the final testing increased by 0.34, the percent increase of the mean performance being 1.3%. During the experiment, the intervention on the five teams was performed three times a week for 20-25 minutes.

Conclusions. Distributive attention significantly improved following the intervention. Correct reactions increased by 1.26, erroneous reactions decreased by 32.5%, and there was a 1.3 increase in the mean performance at the final testing; the mean increase was not statistically significant, $p=0.300>0.05$, for $Z=-1.036$.

Focused attention improved following the intervention, correct responses increased by 16.6%, erroneous responses decreased by 67.8% at the final testing, and performance dispersion registered a decrease of only 3.1%, which means that it was not statistically significant, $p=0.887>0.05$, for $Z=-0.142$.

Keywords: football, sports performance, distributive attention, focused attention, sport.

Introduction

The study of attention is one of the most important fields in cognitive psychology and cognitive neuroscience, because it addresses fundamental questions such as “voluntary control and subjective experience which appear and regulate our behavior” (Posner, 2007).

Attention consists of orienting and focusing cognitive mental activity on an object or a phenomenon (Cosmovici, 1999).

Epuran et al. (2008) define attention as the basic requirement for the conscientization of the entire psychobehavioral life, supporting the idea that without attention, no external or internal information is received or processed.

According to the authors, attention is the function of selectively orienting and focusing mental activity

on objects and phenomena, with the aim of perceiving and understanding them for an effective organization of behavior (Epuran, 2008).

Attention is a distinct process having its own content and being an attribute of mental processes. Oscillation of attention occurs as an effect of protection inhibition; fixation of attention is easy in the case of action with moving objects (Iosif, 1996). Attention allows optimizing knowledge of an object by its separation from what surrounds it. The manifestation of attention causes effects that are extremely important for mental life. Of these, we mention the following:

- Focusing attention even on a weak intensity stimulus induces a perception of the stimulus as much stronger than it actually is.
- The increase in the clarity of an object or a phenomenon is also the result of focusing attention.

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- The rapid perception of a fact, an object or an event is another effect caused by the manifestation of attention.

In order to reach optimum sports performance, it is imperative for athletes to remain focused throughout the duration of a competition. If they manage to focus on essential information and avoid disturbing factors, they have a good chance to perform at the highest level (Crăciun, 2012).

Attention does not have a specific content. It rather designates a condition of mental life due to the fact that the environment in which we live is extremely complex, and we are quite limited in processing information. Depending on the presence or absence of the intention to be attentive, *voluntary attention* has been differentiated from *involuntary attention*.

Involuntary attention is defined by the fact that orientation and focus are spontaneous, involuntary and effortless. Voluntary attention does not occur naturally; it is intentional and consciously self-regulated. The selective direction of cognitive and psychomotor activity is based on the regulatory function of language. Attention is focused by self-command or command: "I should be attentive", based on an adequate motivational stimulus. Voluntary attention supports activity at all times, which is why many researchers consider that voluntary attention is decisive for the development of activity. During competition, attention is focused on the opponent, ready to communicate "key" actions or movements, important for the continuation of the competition. Waiting, anticipating and following the movements are orientations of both perceptual attention and action-based attention, as a preparatory motor attitude, as an anticipation of action (Epuran, 2001).

Researchers have studied the orientation of attention in sport and have found a number of results of which we mention the following:

- All studies show that subjects who participate in open skill sports, such as boxing (Nougier, 1989), hockey (Enns, 1997), pentathlon (Nougier, 1989), football (Lum, 2002), or volleyball (Castiello, 1992), had a higher attention level than novices for orienting their attention in the visual space. Athletes might prefer to pay proportionally less attention to highly probable events and more attention to less probable events. This is unlikely to be the case of athletes who practice closed skill sports (Nougier, 1996).

- Other studies demonstrate that professional athletes can modulate their attention according to the task-specific requirements (Castiello, 1992). More precisely, experienced volleyball players (Pesce, 1998) and professional skiers (Turatto, 1999) showed a better adaptation of attentional focus efficacy, which means that depending on the task, professional athletes are better than novices at modulating the attentional focus dimension.

- Physical exercise or submaximal load leads to a reduction of the reaction time among professional athletes, and especially, for non-valid indices, the attention reaction time decreased (Pesce, 2004).

- Attentional orientation may also have an influence on the control of a motor skill during its execution (Lépine, 1989) or the performance of a decision-making task specific to each sport.

Regardless of its form of manifestation (involuntary,

voluntary or post-voluntary), attention evidences a set of highly objectifiable and relatively rigorously quantifiable dimensions, based on which it can be analyzed, compared and evaluated. Among the most important dimensions we mention: volume, focus, stability, mobility and distribution.

"The volume of attention expresses the number of distinct "elements" or "entities" (letters, numbers, syllables, words, geometric shapes, images, objects) that a subject can embrace simultaneously with high and relatively equal clarity (on a perceptive or on a mental plane – representation, imagination)" (Golu, 2005).

Objectives

We aimed to study the relationship between attention and sports performance, more precisely, to show the fact that attention is an important predictor of sports performance in football starting with the age of 7-10 years.

Hypothesis

Following the psychological training program proposed for implementation, we assumed that football players might have a significantly higher post-test level of attention and sports performance compared to pre-test values.

Material and methods

Before initiating the study, the approval of the Ethics Committee of the Faculty of Physical Education and Sport of the "Babeş Bolyai" University in Cluj-Napoca was obtained, as well as the informed consent of the subjects and their parents' written consent.

Research protocol

a) Period and place of the research

The research was initiated on 1 August 2015, and the intervention program was applied until 20 July 2016. The research was carried out at the training facilities of the sports clubs. Initial testing was conducted in the period 1-10 August 2015. During the experiment, the intervention on the five teams was performed three times a week for 20-25 minutes. The final testing was conducted in the period 10-20 June 2016. During this period, the children had two holidays: from 23.12.2015 to 04.01.2016 and from 29.04.2016 to 16.05.2016.

b) Subjects and groups

The study was performed in 90 subjects, male athletes aged 9 years, members of the football clubs ACS Best Junior Cluj-Napoca, Star Mediaş, Viitorul Luduş, Armenopolis Gherla and ACS Satu Mare.

c) Tests applied

- *Focused attention* was measured using the *EM – 05.48 C focused attention tester*. The device controlled by microprocessors is designed based on modern electronic solutions. It is used to examine the stability and oscillation of attention, and it can provide information about the rapidity of observation and understanding, as well as about risk-taking willingness. This machine provides indications about dysfunctions in understanding the work tasks and about the observation capacity performance. The focused attention test can be used in all fields where sustained and continuous attention plays an important role in activity.

Examination using the focused attention tester can be included in the methodology of various studies because measurements also provide information about memory qualities, the focused attention capacity, as well as about the degree of resistance to monotony.

- *Distributive attention* was measured using the combined EM – 05.54, EM 05.55 distributive attention tester. This device for the combined testing of distributive attention, of the focused attention capacity and eye-hand coordination can be successfully used in skill testing, in activities involving a high level of attention. The machine as a testing instrument can also be used for educational counseling. There is a junction between attention and vigilance, which is why the results obtained are an important landmark in the evaluation of a subject's capacity. The tester can be used in the field of mental skill testing, as well as in scientific research.

Methods for the development of focused attention

The subjects were arranged in a line, each with the ball at their foot. Each player executed 3 shots from 8-10 m, at a fixed point: on the goal net, a red card was placed that each subject had to hit. Each subject was given time to focus without being disturbed by the other players. The exercise was performed simultaneously at the two goals, the subjects being divided into two equal groups.

Methods for the development of distributive attention

The subjects were placed in two lines facing the goal; each player executed 3 shots from 8-10 m, at a fixed point. Two subjects shot at the goal at the same time, trying to hit the card on the goal net. The exercise was carried out at one goal, while attempting to distract the attention of the two players as much as possible.

Exercises useful for distracting attention and developing distributive attention:

- at the moment of shooting, the coach whistles;
- at the moment of shooting, the coach shouts the name of a subject.

d) Statistical processing

The results were statistically processed using the SPSS software (variant V23) and Microsoft Office 2010, Word and Excel. Data were statistically processed using the Student t test.

Effect size

The tests for the verification of the statistical hypotheses, through the *p* threshold value, indicate whether there are statistically significant differences between the means of the two tests, but not the size of the difference. The effect size, assessed as small, medium, large, small to medium, etc., quantifies the size of the difference. The size of the difference between the mean results of the two dependent tests (same sample) was evaluated using Cohen's effect size index.

Results

Table I
Distributive attention – correct reactions, erroneous reactions and performance (progress).

Statistical indicators	TI	TF	Z	p
Correct reactions - Mean	130.27	131.53	0.974	1.26
Erroneous reactions	5.13	3.47	-2.728	0.006
Progress (mean performance)	26.05	26.39	-1.036%	0.300

Table II
Focused attention – correct responses, erroneous responses and performance (progress).

Statistical indicators	TI	TF	Z	p
Correct responses - Mean	21.73	25.33	-2.560	0.010
Erroneous responses	3.93	1.27	-3.191	0.001
Progress (mean performance)	19.53	18.92	-0.142%	0.887

Discussions

In conclusion, from a psychological point of view, attention is a form of mental life, which applies to various contents and consists of a focusing of consciousness on a limited area. Attention is a synthesis function, gathering all available data and resources around an object or a phenomenon. It is a state of relative monoideism facilitated by the intervention of motivation and emotions. A role is also played by previously acquired knowledge and skills. The solution of voluntary attention problems depends on the progress made in the study of volition.

The attention focusing capacity varies significantly from one individual to another. It is an expression of the entire personality, mainly expressing its aspirations (Cosmovici, 1996).

In Table I, it can be seen that the number of correct reactions increased at the final testing by an average of 1.26. The means were 130.27 at the initial testing and 131.53 at the final testing. The percent increase was 1.0%. The dispersion of the results of both tests was homogeneous. The difference between the means was small to medium. The increase in the number of correct reactions was not statistically significant, $p=0.330>0.05$, for $Z=-0.974$. The null hypothesis was accepted.

The number of erroneous reactions decreased at the final testing by an average of 1.66, the mean values being 5.13 at the initial testing and 3.47 at the final testing. The percent decrease in erroneous reactions was 32.5%. The dispersion of the data of both tests was inhomogeneous. The difference of the means was medium to large. The number of erroneous reactions decreased significantly, $p=0.006<0.05$, for $Z=-2.728$. The null hypothesis was rejected (Table I).

The mean performance increased at the final testing by 0.34, the mean values being 26.05 at the initial testing and 26.39 at the final testing. The percent increase in the mean performance was 1.3%. The results were homogeneously dispersed in the case of both tests. The difference between the means was small to medium. The mean increase was not statistically significant, $p=0.300>0.05$, for $Z=-1.036$. The null hypothesis was accepted (Table I).

The correct responses for focused attention increased at the final testing by an average of 3.60. The mean values were 21.73 at the initial testing and 25.33 at the final testing. The mean percent increase was 16.6%. The dispersion of responses was inhomogeneous at the initial testing and relatively homogeneous at the final testing. The difference between the means was medium to large. The mean increase of correct responses for focused attention was statistically significant, $p=0.010<0.05$, for $Z=-2.560$. The null hypothesis was rejected (Table II).

The mean number of erroneous responses for focused

attention decreased at the final testing by 2.66, the mean values being 3.93 at the initial testing and 1.27 at the final testing. The percent decrease of erroneous responses was 67.8%. The dispersion of the results of both tests was inhomogeneous. The difference between the means was large to very large. The decrease in the mean number of erroneous responses was statistically significant, $p=0.001<0.05$, for $Z=-3.191$. The null hypothesis was rejected (Table II).

The results recorded for the dispersion of focused attention decreased at the final testing by an average of 0.61, the mean values being 19.53 at the initial testing and 18.92 at the final testing. The percent decrease of dispersion was 3.1%. The results obtained were inhomogeneously dispersed in the case of both tests. The difference between the means was very small. The decrease in the dispersion of focused attention was not statistically significant, $p=0.887>0.05$, for $Z=-0.142$. The null hypothesis was accepted (Table II).

Conclusions

The results obtained following the two tests, initial and final, demonstrate that the introduced variable caused progress, focused attention as well as distributive attention being significantly improved at the final testing.

Distributive attention was considerably improved following the intervention. Correct reactions increased by 1.26, the number of erroneous reactions decreased by 32.5%, and there was a 1.3% increase in the mean performance at the final testing; the mean increase was not statistically significant, $p=0.300>0.05$, for $Z=-1.036$.

Focused attention improved following the intervention, correct responses increased by 16.6%, erroneous responses decreased by 67.8% at the final testing, and there was a decrease of only 3.1% in the dispersion of performance, which means that it was not statistically significant, $p=0.887>0.05$, for $Z=-0.142$.

Conflicts of interests

Nothing to declare.

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Education and Sport of the "Babeş-Bolyai" University in Cluj-Napoca.

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