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THE EFFECT OF PLAYING CHESS ON FOCUSED ATTENTION

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Abstract

Attention focus, which is the ability to concentrate mental energy on an object, phenomenon or process, is a basic condition for the efficiency of the performed activity. Chess is a sport with benefits that have often been demonstrated, one of its advantages being the improvement of concentration. Today, many children are easily distracted by perturbing factors when performing important actions, which leads to poor performance. This paper aims to analyse how the study of chess improves the attention span in primary school children. The study subjects were 29 primary school children aged 6-11, both boys and girls from urban and rural areas, who participated in chess courses once a week for half a year. Some of them started chess courses at the beginning of the study, and others had a year or two in which they studied chess once a week. They were given initial tests before starting this study to see what attention span they had and, after 6 months, they were given final tests to see if there was any improvement in their focus. The tests used were the Kraepelin, Bourdon-Anfimov and Toulouse-Pieron focused attention tests. The results showed an improvement in focus for the majority of subjects.

Keywords: Chess, attention, concentration.

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1. Introduction

Chess is a mental game played by two people using a board of 64 white and black squares and 16 pieces each and one of the most important skills needed to be a good player is concentration, because it is necessary to be able to detect various threats, possibilities and attacks.

Chess is seen by some people as just an amusing activity, but many of the highly valuable qualities of the mind can be acquired or strengthened with this sport (Sala et al., 2017). Most people think the study of chess is beneficial to children, and this persuades parents to enrol their children in an extracurricular chess club or to take advantage of a chess class at school.

Educators consider using this sport as a training strategy to stimulate intellectual processes such as attention, memory, creativity and reasoning (Krogius, 1972), or to strengthen abilities as concentration, problem solving, planning strategies and creativity for students with special educational needs (Storey, 2000).

In the academic field, chess started to gain attention when some researchers proved that chess skills lead to the improvement of academic achievement due to their transferability to other areas (Smith, 1998).

Over the past few years, numerous studies have been carried out to prove the cognitive benefits of training chess (Gliga & Flesner, 2014). In other studies, some children in experimental groups who had studied chess for a specified period were compared to children in control groups who had not participated in chess lessons. This comparison showed an evolution of the first group in several aspects such as intelligence, memory, critical thinking (Ferguson, 1988).

An ability of children that is not fully exploited is their attention, which is the psychic phenomenon that designates the activity of selective orientation, of focusing the mental energy on an object, for the purpose of deeper knowledge and efficient action, along with all its qualities: volume, distribution, stability, concentration (intensity) and mobility (Mitrache & Tudos, 2015). In our study, we took into account the focus of attention, a primordial aspect in achieving performance both in the sports field and in daily activity. The ability to focus attention depends on several factors: external, such as novelty of objects and situations, intensity of stimuli, movement, variation, change and internal, such as interest.

2. Problem Statement

It is well known that there is no human activity that can be carried out without attention. The success of an activity, including the support of a chess game, depends to a large extent on the attention it is treated with and it has been found that athletes have always been possessing a remarkable ability to concentrate. In the case of voluntary attention specific to the practice of chess, every player must have the will to keep it awake throughout the game. When conducting a long-lasting activity that requires a linear attention, we can not afford fluctuations of attention, but constant focus is needed throughout the match. In the event of rapid changes in focus, such as chess games, where the player must simultaneously control the game, chess clock and the notation of the moves, it is necessary to constantly educate attention mobility. In addition, the chess player acting in difficult circumstances during the game, due to disturbing factors, must gradually become accustomed to evading the negative influence of these external agents. Therefore, attention can be educated as a result of persistent and continuous efforts.

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The problem addressed in this study is about the intensity of attention in the investigated children. The first to use the term "attention" was the psychologist William James (Popescu-Neveanu, 1977). Concentration is an effort to which the subject can become accustomed after many long attempts, and distraction sometimes appears as a symptom of the inability to concentrate. Attention focus, which is the ability to concentrate mental energy on an object, phenomenon or process, is a basic condition for the efficiency of the performed activity.

Unfortunately, the concentration of children is becoming more and more precarious, being distracted by some factors which lead to low performances in their activities. We believe that developing and maintaining this feature of attention is absolutely necessary in good chess performance. We also strongly believe and it has been demonstrated that this higher quality of attention gained through the practice of chess has a character transferable to other day-to-day activities. (Sala & Gobet, 2016)

Through this paper, we want to show that, by studying chess for a longer period, a higher level of concentrated attention can be achieved.

3. Research Questions

Our research questions are:

- Can we increase the level of focus by means and methods specific to chess and, if so, can we use them as educational tools to increase overall concentration capacity?

4. Purpose of the Study

The purpose of this study was to show the effects of chess on focusing. More precisely, we wanted to see if practicing this sport led to a higher level of concentrated attention.

5. Research Methods

For the study, 34 children in grades 1 to 4 were tested. The subjects were boys and girls aged between 6 and 11 (average age = 8.24 years). They were given initial focused attention tests before starting the study and final tests at the end of the chess study period (pre- and post-tests).

Most children were practicing this sport prior to the program, having 1-3 years of chess study experience, while some of them learned the basics of chess at the start of the study. The subjects participated in a chess session once a week for one hour, over a period of six months, from October 2017 to March 2018.

The program consisted in teaching children the basic rules of chess, tactical and strategic elements, and chess-specific memory and visualisation exercises. Kids learned about the basic opening, middle game and ending principles, and they were particularly asked to be highly focused on their opponents' moves, because not paying attention to this might cause difficult situations or even more, the loss of the game.

The tests used to assess progress were the Kraepelin, Bourdon-Anfimov and Toulouse-Pieron focused attention tests. These tests are evidence of cognitive ability assessment, which calls for attention and appreciation of the speed of thinking, resistance to fatigue and monotony, under the condition of a minimal intellectual effort.

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During the program, pupils mainly studied chess elements, as board and chess pieces, how chess pieces move, different types of checkmates, elementary endgames, basic principles in opening, multiple attacks, but they also performed concentration and memory exercises specific to this game.

At the end of the program, the subjects attended a rapid chess tournament and a solving problem contest.

6. Findings

To find out if there is a significant difference in the level of attention concentration before and after studying chess, the statistical Z-test was used, starting from the hypotheses:

- null hypothesis H_0: The study of chess does not change the level of focused attention in children;
- alternative hypothesis H_1: Chess study leads to improved focused attention in children.

Table 01. Results recorded by the subjects in pre- and post-tests

Subject no.	Pre-test - Kraepelin (Score)	Post-test - Kraepelin (Score)	Pre-test - Bourdon-Anfimov (Accuracy ratio, %)	Post-test - Bourdon-Anfimov (Accuracy ratio, %)	Pre-test - Toulouse-Pieron (Score)	Post-test - Toulouse-Pieron (Score)
1	23	28	98	99	65	70
3	10	15	82	87	29	37
4	36	41	99	99	64	71
5	15	15	95	97	48	61
6	17	25	99	99	46	58
7	24	29	98	98	62	69
8	37	39	99	99	70	78
9	21	25	91	96	61	69
10	29	34	95	98	55	75
11	36	37	96	98	58	72
12	13	13	98	99	59	62
13	26	35	99	100	60	66
14	34	52	99	100	62	62
15	25	24	96	99	57	63
16	8	10	87	90	35	38
17	31	30	98	100	64	69
18	25	31	96	100	55	54
19	38	43	98	99	71	75
20	17	21	89	92	49	56
21	26	28	100	100	85	89
22	25	29	94	97	65	65
23	27	31	98	99	67	72
24	14	17	99	99	48	57
25	13	18	75	85	51	63
26	20	24	95	98	43	59
27	21	24	99	99	49	58
28	17	22	91	98	29	36
29	34	32	99	99	66	72
30	32	40	99	100	68	74
31	24	30	98	99	57	63
32	37	41	98	98	64	65
33	28	40	98	98	57	65
34	28	31	100	100	58	67

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Table 02. Pre-, post-test and Z-test results

Test	Pre-test		Post-test		Z-test (p-value)
	M	SD	M	SD	
Kraepelin	24.53	8.28	28.91	9.53	0.02<0.05
Bourdon-Anfimov	0.96	0.05	0.98	0.04	0.046<0.05
Toulouse-Pieron	56.97	11.89	64	11.27	0.01<0.05

M=mean, SD=standard deviation, α=0.05

Table 03. Evolution of recorded scores (%)

Test	Pre-test mean	Post-test mean	Score evolution (%)
Kraepelin	24.53	28.91	18%
Bourdon-Anfimov	0.96	0.98	2%
Toulouse-Pieron	56.97	64	12%

As can be noticed in the data presented above (Tables 01, 02 and 03), there was a positive evolution of the scores in all three tests given to the subjects. With regard to the mean, which characterizes the entire sample, one can see an increase in the sample for all three tests performed by the subjects. In the case of the Kraepelin test, it increased by 18%, the Bourdon Anfimov test, by 2%, and at the Toulouse Pieron test, the increase was 12%. Following the Z-test, there was a significant improvement between the results obtained in the final tests ($p<0.05$), compared to those obtained in the initial tests. Thus, we can reject the null hypothesis that the study of chess does not change the level of focused attention in children and we accept the alternative hypothesis, agreeing that the study of chess leads to improved concentration in children.

7. Conclusion

Following the study, we wanted to check whether the continued study of chess could achieve a higher level of attention concentration in primary school children and show once more the educational value of chess on children. Most subjects improved their focused attention and very few subjects did not show a significant difference between the results of pre- and post-tests.

In conclusion, our study has shown that chess can help children develop certain cognitive skills, but this is only valid in the context of a structured study that focuses on exercises of attention, memory, decision-making etc., which are specific to the sport of chess.

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