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IMPACT OF ARCHERY PRACTICE ON ATTENTION AND HAND EYE COORDINATION ON YOUNG ADULTS

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Abstract

The purpose of the current study was to judge the talents that may completely influence Young Adult's development, like attention and eye-hand coordination, among young competitors and non-competitor association archery players. ***A total of 26 archery players (18-25 years) (Non-competitors archery group: 13 players who practice two days a week at Raj Sports Club Jaipur; Competitor archery group: 13 players playing in Raj Archery club Jaipur)*** *took part in present study. Subjects are tested on a standard laboratory Cognitrone Attention-Concentration Test (COG) for their ability to hold a stylus in a series of holes decreasing from 12.5 mm to 2.5 mm without touching the sides of the holes. The number of contacts and the contact time during the test are noted. According to the results of 9 hole steadiness test, there was a statistically significant difference between the two groups in terms of the mean time of correct rejections and the total working time. It can be said that decision time in the steadiness test of competitor soccer players is better than that of non-competitor archery players are not so good in taking decisions in the steadiness test than competitor archery players. Results of two arm coordination test revealed that, there were no significant differences between competitors and non-competitor archery players in two arm coordination time and accuracy. According to the results of the present study it can be said that being a competitor in archery young adults has a positive effect on percentage of success in the decision time in eye-hand coordination test.*

Keywords: *Attention, Hand-eye coordination, Young adults*

1. Introduction:

Archery is one of the oldest known sports. The bow, as an effective long range weapon, contributed to the early survival of man, supplying him with meat and leather and fur for clothing, as a mean of both attack and defense.[1]

The world of games and sports is ever expanding with intensity of competition, and enlarging scientific studies of human movement. Sports is dynamic in nature and progressive in outlook. It is not confined to "what has been", but its target is ti fix new targets. [2]

Technology permeate every aspects of life. Sports is no exception for Inodern youth to develop physical capacities beyond anything earlier imagined. Sports have become highly competitive and records are being broken with great rapidity.[3]

No one knows who made the first bow and arrow. Somewhere back in the vast dimness of time one of our ancestors tied a piece of leather thong to the opposite ends of a stick, fitted another small stick into the thong and the first archer came into being.[4]

The Bow has been a part of a recorded history for more than 50,000 years, but its existence was established well before that time. Archeologists estimates from cave drawings depicting archers that the bow was in use at least 1,00,000 years age. For thousands of years, human beings used propelled arrows to protect themselves from wild animals. At the same time archery skill was used to obtain food. The bow became a symbol of strength and power, it gave man a certain status and advantage to his environment.[5]

With. the increased interest in archery came some surprising development in equipments. Just as the past two or three decades brought thousands of new fans into the game, they have also brought changes in ideas, design and materials. Basically, archery have remained unchanged for at least five thousand years. But as more and more people from every walk of life took up archery, they brought to it broader thinking, new ideas and new techniques.[6]

Basics of sports are known as Attention, concentration, eye-hand coordination and reaction time. The attention-grabbing physical and mental characteristics of human nature have been included in the sports literature as general information, particularly in research articles that analyse how much various activities done for a certain period of time affect them (Bańkosz, Nawara, & Ociepa, 2013, Boot et all. 2008 Crawford, Medendrop & Marotta, 2004, Ederman, Murray, Mayer &Sagendorf, 2004, Göral, Saygın & İrez, 2012).

Hand-eye coordination is the ability of the vision system to coordinate the information received through the eyes to control, guide, and direct the hands in the accomplishment of a given task, such as handwriting or catching a ball. Hand-eye coordination uses the eyes to direct attention and the hands to execute a task.[7]

The visual-motor coordination skills include: walking, running, jumping, climbing, cooking, dressing, undressing, buttoning, washing hands and face, brushing teeth, cycling, driving, using computer, coloring, reading writing and using scissors. Hand-eye coordination problems are usually first noted as a lack of skill in drawing or writing. Drawing shows poor orientation on the page and the child is unable to stay "within the lines" when using a coloring book. Often the child continues to depend on his or her hand for inspection and exploration of toys or other objects. Poor hand-eye coordination can have a wide variety of causes, but the main two conditions responsible for inadequate hand-eye coordination are vision problems and movement disorders.

In addition, they play a significant role in self-sufficiency and successful school and social life. The development of visual motor coordination in children starts with directing towards various objects within their visual field and using their body and hands (Ercan &Aral, 2011). [8]

Athletes should have high physiological and motor performance for success in sports. Most sports are driven by adrenaline, high energy, sweat, and peak performance. Archery is a more settled sport where calmness, focus, controlled-energy, and stillness are keys to success as the goal is repeatedly hitting the bullseye. It offers a new refreshing spin to sport. Particularly for archery players, Archery trains the hands to work together while performing different tasks, aiming and firing the arrow based on input from your eyes. Hand-Eye coordination is an essential skill for mastery in archery. This skill is developed through a lot of regular practice. Coordination improves with repetition and practice.

attention is imperative to success. This is the one element that makes archery really stand out from other sports. Archery is a mind exercise where distractions need to be eliminated to be successful. A keen eye, clear concentration, and mental stability are keys to top shots, shot after shot. Of course, calculating in your mind and keeping tabs on scores requires clear thinking as well.

Archery is a great sport to make a top student-athlete. The mental training from archery can be carried over into the classroom.

This study evaluates the skills considered to have positive effects on both child development and sportive performance such as attention and eye-hand coordination of young competitor and non-competitor archery players.

2. **Statement of Problem:** Examination attention and eye-hand coordination skills, in competitors and non-competitor archery players.
3. **Purpose of the Study:** The purpose of present study was to evaluate the skills that will positively influence child development, such as attention and eye-hand coordination, among young competitors and non-competitor archery players.

4. Research Methodology:

4.1 Participants:

The study was conducted with 26 (18-25years) archery players, 13 non-competitor archery players training twice a week at Raj Sports Club and 13 competitor archery players playing for Raj Sports Club. The licensed archery players who competed for Raj Sports Club were included in the competitor group, and the non-licensed players who attended the archery school, but did not compete, were included in the non-competitor group.

4.2 Method:

The assessments were made at the Raj Sports Club. The attention and eye-hand coordination tests were administered to both groups in the meeting area in the training ground.

Cognitrone Attention-Concentration Test (COG); Cognitrone is a general ability test that assess attention and concentration among the Vienna test system batteries. It requires noticing the similarities between constantly changing figures within the tests' integrity and reacting rapidly and correctly. Participants are asked to compare the figures on the screen and make a decision about their similarities. Four different figures are displayed on the upper part of the screen, and one figure is displayed on the lower part. Participants are asked to press the green button on the panel with their right hands when they understand that the figure on the lower part matches with the figure on the upper part; or otherwise, to press the red button. The total duration of the test is 15 to 20 minutes (Psikotek Consulting, 2012).

Eye-Hand Coordination Assessment; Eye-hand coordination was assessed using the Two Arm Coordination Test. This test was done using the Lafayette Instrument Two-Arm Coordination Tester Model 32532A and the Lafayette Instrument Silent Impulse Counter Model 58024C (Lafayette, 2004). This test assesses the participants' two eye-hand coordination by tracking the star on the test device using a metal pointer with both hands clockwise and counter-clockwise. Whenever the participants deviate from the trace they should track, the stimulant counter records it (Green,1996).

The statistical analysis of the data was done using SPSS and Excel (Analyses Tool Pack) software. First, the data were subjected to descriptive statistics. The normal distribution criteria were determined using the Shapiro-Wilk test since the sample size was under 50. The independent samples t test was used for normally distributed variables, and the Mann-Whitney U test was used for non-normally distributed variables during the comparison of competitor and non-competitor groups. Results are shown as mean ± SD, and for all comparisons $p<.05$ was considered significant.

4.2 Findings:

A total of 26 archery players (13 competitors and 13 non-competitors) from the Raj sports Club, Jaipur, voluntarily participated in the study with their families' permission. The Cognitrone Test, a computer-based attention test and Lafayette Two Arm Coordination Test were administered to the participants. The competitor group was significantly older than the non-competitor group ($p<0.05$).

Table 01. Attention test values of competitor and non-competitor archery players who participated in the study

	Competitor archery player (CP) (n=13)		***t-value***	*Non-Competitor archery player (NCP) (n=13)*	
	Mean	S.D.		Mean	S.D.
Mean time of correct rejections (sec)	2.32	0.74	**t=-2.67 p=.01**	2.26	0.57
Sum of correct rejections	26.31	3.96	**Z=-1.769 p=.72**	35.00	2.96
Mean time of correct reactions (sec)	1.15	0.44	**t=.-1.68 p=.08**	2.88	0.43
Sum of correct reactions	17.00	3.29	**Z=-1.781 P=.06**	19.15	2.80
Working time (sec)	136.62	34.09	**t=-2.59 p=.01**	195.85	46.72
Sum of misses	11.69	6.27	**Z=-2.569 p=.18**	6.99	4.47

No significant difference was found between CP and NCP sum of and mean time of correct reactions, the sum of correct rejections and sum of misses (p>0.05). A statistically significant difference was found between the competitor and non-competitor groups in terms of the mean time of correct rejections (CP=2.32±0.74 sec, NCP=2.26±0.57 sec) (p>0.05).

The competitor group showed significantly shorter mean times of correct rejections than the noncompetitor group. A statistically significant difference was found between the groups in terms of the working time (total processing time) (t=-2,59, p=.01). The competitor group obtained a better mean score on the Cognitrone Test than the non-competitor group in terms of the working time (CP=136.62±34.09 sec, NCP=195.85±46.72 sec).

Table 02. Eye-hand coordination values of competitor and non-competitor Archery players who participated in the study.

	Competitor archery player (CP) (n=13)		***t-value***	*Non-Competitor archery player (NCP) (n=13)*	
	Mean	S.D.		Mean	S.D.
Clockwise time (sec.)	26.10	3.26	**t = 1.35 p =.16**	22.26	3.36
Counter-clockwise time (sec.)	26	3.97	**t = 0.75 p = .41**	22.65	4.21
Number of Clockwise error	6.69	5.98	**Z=. 895 p = .41**	9.95	9.75
Number of Counter-clockwise error	8.25	5.66	**Z= .049 p = .89**	8.22	5.21

No significant difference was found between CP and NCP sum of and mean time of Clockwise time (sec.), the sum of Clockwise time (sec.) and Counter-clockwise time (sec.) (p>0.05). A statistically significant difference was found between the competitor and non-competitor groups in terms of the mean time ofclockwise time (sec.) (CP=26.10±3.26 sec, NCP=22.26±3.36 sec) (p>0.05).

The competitor group showed significantly shorter mean times of correct rejections than the non-competitor group. A statistically significant difference was found between the groups in terms of the errors (z=.895, p=.41). The competitor group obtained a better mean score on the Two arm Coordination Test than the non-competitor group in terms of the errors (CP=6.69±5.98 sec, NCP=9.95±9.75 sec).

5. Conclusion:

This is true for archery, but also for whatever objective you're targeting. Improve your attention, and your chances of succeeding increase. Lose your focus, and your chances of succeeding decrease. Here's a hard truth we all live by, whether we realize it or not: no matter what your goal, your ability to concentrate determines whether you will succeed or whether you fail. It's a hard, plain, inescapable fact. Your ability to quiet that inner voice, shut out all external stimuli, and concentrate on your task is of the utmost importance, and you won't achieve your goals without that ability.[9]

No study was found in the literature that compares competitor and non-competitor archery players in this age group in terms of these variables. This section refers to different studies in the literature.

Bayar and Koruç (1992) assessed the reaction time and eye-hand coordination of the students in summer sports school at the 19 Mayıs Sports Site who were born between 1977 and 1982 and observed that female students born in 1982 had a shorter reaction time than male students at the same age. However, males' reaction times shortened and females' reaction times lengthened as they got older (Boyar, 2013).[10]

A study that aimed to determine the light (visual) reaction times of male archery players aged between 9 and 14 found that a archery training program provided for 16 weeks positively affected children's light (visual) reaction time (Boyar, 2013). [11]

Marancı (1999) conducted a study with amateur archery players and found that the reaction times to a visual stimulant were 470 msec for goalkeepers, 530 msec for defensive players, 510 msec for midfield players and 490 msec for strikers. Their reaction times to an auditory stimulant were 397 msec for goalkeepers, 490 msec for defensive players, 430 msec for midfield players and 420 msec for strikers (Marancı, 1999).[12]

No significant difference was found between the competitor and non-competitor archery players for the clockwise time, counter-clockwise time, number of clockwise and counter-clockwise error variables. The archery players in both groups obtained very similar results in eye-hand coordination.

In conclusion, this study found that the attention and hand eye coordination were different between competitor and non-competitor trained archery players aged between 18 and 25 years, and that being a competitor or non-competitor did not affect their eye-hand coordination. It can be concluded that similar trainings of the competitor and non-competitor archery players led these groups to show no difference. Attention and hand – eye coordination are important variables that create the difference between successful and unsuccessful players in archery.

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