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THE ROLE OF SIGHT IN TABLE TENNIS (REMOTE MOVEMENT AND RETURN OF THE EYE)

Abstract

The purpose of our study was to investigate the role of practice in the ability to quickly move the eyes backwards and forward in order to follow the moving ball. 30 participants were used in the research, one half of participants were talented table tennis players (aged between 10 and 45, average age 19, 86) and the other half were non - athletes (also aged between 10 and 45, with the average of 33,60 years). The angle of observing the ball in each case was 28 degrees.

The results show that there are highly significant differences between the speed of moving one's eyes backward and forward in order to follow a moving object (in this case a ball) between table tennis players and non – athletes, the former being more successful in the task. These results enable us to improve our selection process for gifted young table tennis players and encourage us in further development of additional practices for improving eye – movement speed.

Key words: *table tennis, sight, speed*

Introduction

The design of the human eye was necessary to meet the competing evolutionary demands for high visual acuity and a large field of view. There is simply not enough neural real estate available in the brain to support a visual system that has high resolution over the required field of view. In table tennis we have best proof therefore with following a ball which is flying with the speed more than 160 km/h.

Eyes are the visual organs that have the retina, a specialized type of brain tissue containing photoreceptors and interneurons. These specialised cells convert light into electrochemical signals that travel along the optic nerve fibres to the brain.

The visual system in the brain is too slow to process information if the images are slipping across the retina at more than a few degrees per second (Westheimer and McKee, 1975). Thus, to be able to see while we are moving, the brain must compensate for the motion of the head by turning the eyes. Another specialisation of visual system in human is the development of a small area of the retina with a very high visual acuity. This area is called the fovea, and covers about 2 degrees of visual angle in people. To get a clear view of the world, the brain must turn the eyes so that the image of the object of regard falls on the fovea. Eye movements are thus very important for visual perception, and any failure to make them correctly can lead to serious visual disabilities

Table tennis is the fastest ball game in the world. To react on time a player has too have among other motor abilities also best predispositions to catch a ball with his/her eyes. This is also one point which differentiates best players from other ones.

Providing research on 25 players of the German table tennis team who play on the national and worldwide level, Gendrusch (2006) found out that the strength of Timo Boll on the moving ball with 170 kilometres speed in an hour is 20 percent higher than the average sight of the above 25 players. This research has shown how well his eyes and movement have followed the ball, and how he has had control of his sight. The muscles of his eyes have strength of movement of 300 degrees in a second, which is even higher

than the best goalkeeper in German Bundesliga - whose record is 297/5 degrees in second.

Because of that fact Timo's national coach D. Schimelpfening says that because of the strong relationship between the strength of sight and his strokes, we can see that he has become one of the best players in the world.

The role of the eye is not only essential in hitting main strokes but at the same time the player must observe his opponent. The coach has to recognize the strength of sight and the anticipation of the movement of the opponent as the most important useful abilities in table tennis and has to place half of the strength of sight as the acceptance number in table tennis; of course the cost of the pre-experiment also should be allocated.

Research Goal

The goal of our research was the study and the comparison between the speed of forward – backward eye movement (voluntary nystagmus) of two groups of practiced and unpractised (table tennis) subjects.

Research methods

Was semi-experimental in which the ball was stable in one corner of the table and the subject was placed on the other side, while her head was also stable she was asked to move her gaze as faster as possible from the ball to the midline of the table.

The number of forward-backward movement of the eye in one minute was counted in each subject and two groups were compared.

Control Group: 15 persons of the players of the table tennis association of the province of Guilan in the age group range of adolescent, young and adult (10 to 45 years).

Experimental Group: 15 non – athletic persons (age range was 10- to 45 years)

Length time of Experiment: studding 1 minute of the forward and backward movement of the eye and it's count.

Equipment: cameras, sensors and table tennis equipments.

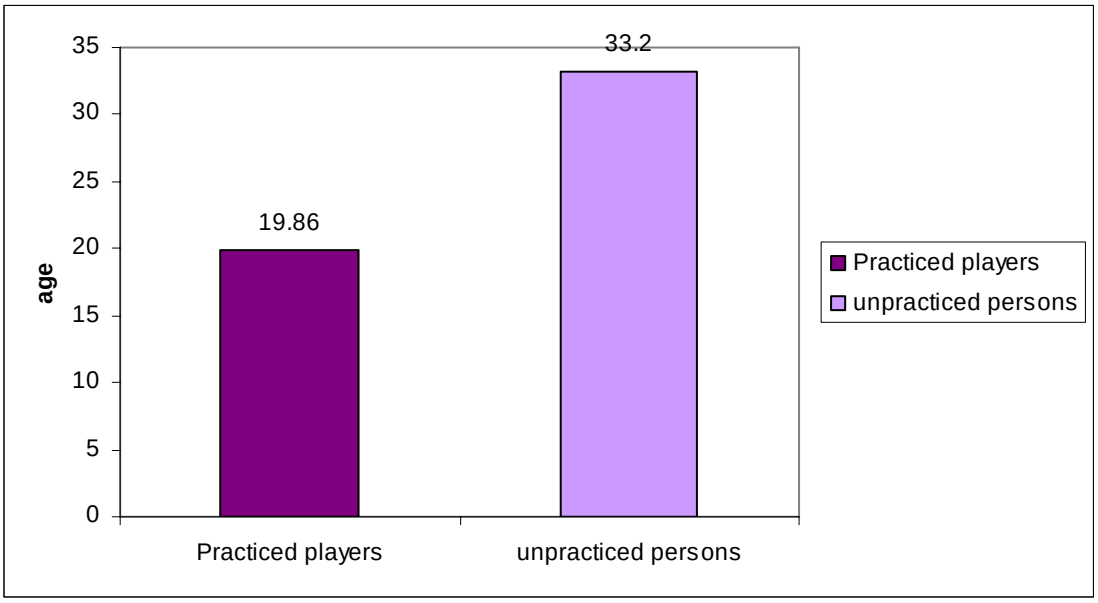
Results and Discussion

The average cycle/minute of the unpractised (experimental group) was 47.2 while that of the control (practiced) group was 68.4 with a standard deviation of 21.2.

Using the T-table test, each time T 28 was calculated independently and a p-value of 3.87 was harvested.

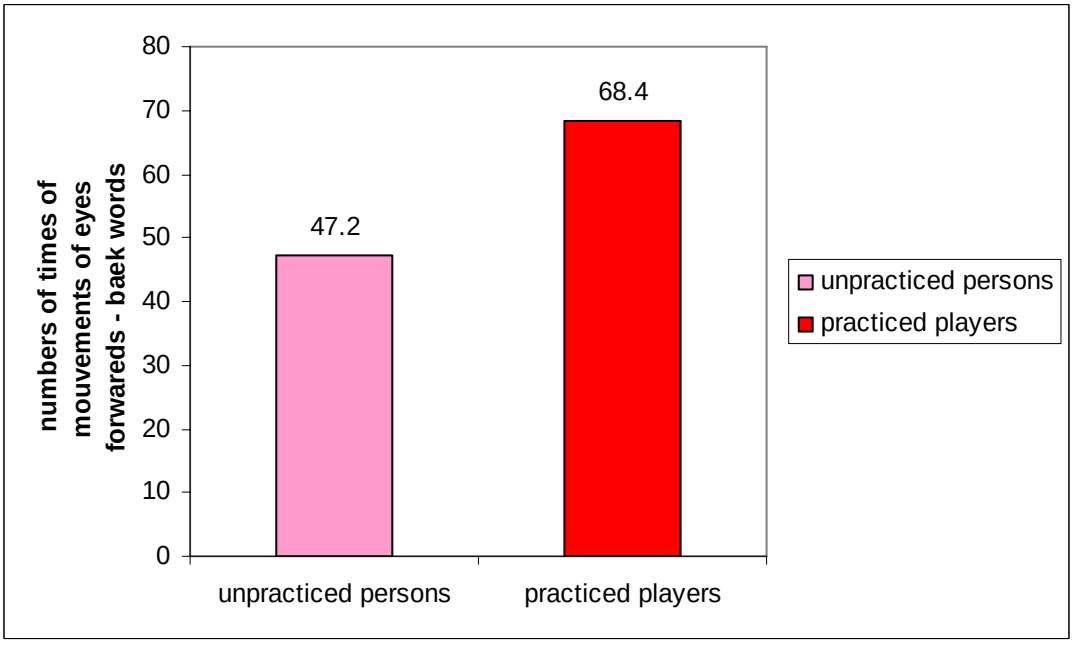
Hence meaningful difference between the two groups has a certainty of 99 percent.

Figure 1: Age of participants



Average age of practiced players is 19.86 years and average age of the unpractised persons is 33.2 years.

Figure 2: Results of measurement



Statistical inferences
Average of practiced Group → 68/4
Average of Unpractised Group → 47/2
Difference of average → 21/2

30 participants have participated at our research; one half of participants were talented table tennis players (aged between 10 and 45, average age 19, 86) and the other half were non - athletes (also aged between 10 and 45, with the average of 33,60 years). The angle of observing the ball in each case was 28 degrees.

The results show that there are highly significant differences between the speed of moving one's eyes backward and forward in order to follow a moving object (in this case a ball) between table tennis players and non – athletes, the former being more successful in the task. These results enable us to improve our selection process for gifted young

table tennis players and encourage us in further development of additional practices for improving eye – movement speed.

Conclusion and suggestion

The purpose of our study was to investigate the role of practice in the ability to quickly move the eyes backwards and forward in order to follow the moving ball.

With the accuracy of our table tennis test, we can see the sight factor for choosing potentially talented table tennis players and by designing exercises to strengthen the sight factor improve the performance of table tennis players.

References

1 Carpenter, Roger H.S. (1988). *Movements of the Eyes (2nd ed.)*. London: Pion Ltd,.

2 Gendrusch, J. (2006). Timo Boll - world class in sight. The success of the German team has a great relationship with the exceptional sight of Timo Boll. Sportbild 18/2006.

3 Hadavi, F. (2000). The standards of talent identification in sports. Printed by Physical Education Organization of I.R. Iran. Tehran.

4 Westheimer, Gerald & McKee, Suzanne P. (1975). "Visual acuity in the presence of retinal-image motion". *Journal of the Optical Society of America* 1975 **65**(7), 847-50.