

# Comparison of Visual Simple Reaction Time Performances of Boxers and Wrestlers

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## ABSTRACT

**Background:** It is known that reaction time, which is of great importance in terms of athlete performance, is one of the most difficult sports performance parameters to develop. Reaction time performance in Athletes may vary according to the sport branch in terms of development. Especially in combat sports such as boxing and wrestling, reaction time is of such great importance that it can directly or indirectly affect the outcome of the competition.

**Aim:** In this study, it was aimed to compare the visual simple reaction time performances of boxing and wrestling athletes. By comparing the simple visual reaction times of boxers and wrestlers, the effects of both branch trainings on the reaction time were tried to be determined.

**Methods:** This research was carried out with the participation of 30 male athletes between the ages of 14-17. It was held with the participation of a total of 30 male athletes, including 15 boxers and 15 wrestlers, who have been licensed contestants for at least three years and are still actively participating in the competitions. The heights of the participants were measured with a wall-mounted stadiometer (Holtain Ltd. England), their body weights were measured with an electronic scale (Seca, Germany), and their visual simple reaction time performance was measured with a Reaction Time device (Hubbard Scientific 6027). Data were analyzed with the IBM Statistics (SPSS, ver. 22.0, Armonk, NY) program.

**Results:** The mean age of the boxing group (N=15) was 15.46±1.06, the mean height was 175.53±4.18, the mean body weight was 61.00±8.03 and the mean reaction time was 23.66±2.99. The mean age of the wrestling group (N=15) was 15.40±1.12, the mean height was 170.46±4.29, the mean body weight was 62.80±8.65 and the mean reaction time was 25.93±2.68.

**Conclusion:** In this study comparing the visual simple reaction time performances of boxers and wrestlers, it was concluded that boxing training is more effective in shortening reaction time performance compared to wrestling training.

**Keywords:** Reaction Time, Sporting Performance, Martial Arts

## INTRODUCTION

Athletes apply active and passive warm-up activities to improve performance parameters. As a result of these activities, they can improve existing performance parameters such as agility, anaerobic power, vertical jump, flexibility, reaction time<sup>1-3</sup>. It is known that reaction time, which is of great importance in terms of athlete performance, is one of the most difficult sports performance parameters to develop. Reaction time performance in Athletes may vary according to the sport branch in terms of development. Especially in combat sports such as boxing and wrestling, reaction time is of such great importance that it can directly or indirectly affect the outcome of the competition.

Reaction time is defined as the time elapsed between the stimulus and the response time to the stimulus<sup>4-6</sup>. The stimuli that will enable the athletes to take action can be visual, auditory and tactile. The prominent stimuli in combat sports; are visual and tactile stimuli<sup>7</sup>. Especially, visual reaction time is the determining factor in terms of performance level superiority in many sports branches and it is possible to improve it with training<sup>8</sup>. There have been studies on reaction time performance for many years<sup>9-16</sup>, and it has been reported that physical training can shorten reaction time in most of these studies<sup>9-11,14-16</sup>.

In combat sports, sudden and rapid displacement, a combination of hands and feet with the same skill, or defense and attack at the same time are factors related to one's reaction time. For this reason, visual reaction time is

considered as one of the important elements in combat sports.<sup>17,18</sup>

It is known that boxing, which is one of the competitive and challenging sports branches, is a complex sport activity and requires the presence of various functional features<sup>19</sup>. Muscle strength, speed, coordination, balance, high anaerobic and aerobic power and reaction time are important factors that play a role in athlete performance. As a result of boxing training, it is aimed to improve the aerobic power, muscle strength and endurance, flexibility, coordination and reaction times of the athletes<sup>20</sup>. In the wrestling branch, the combination and coordination of technical and motoric features is very important as well<sup>21</sup>. As in boxing training, wrestling training aims to improve the aerobic and anaerobic power capacities, muscle strength and endurance, speed, coordination, flexibility and reaction times of the athletes.

When the studies comparing the physical performance parameters of boxers and wrestlers were examined, no study was found that compared the visual simple reaction performances. Therefore, the effect of wrestling and boxing training on the visual simple reaction times of the athletes is an important question waiting to be explained.

**Aim of the study:** In this study, it was aimed to compare the visual simple reaction time performances of boxing and wrestling athletes. By comparing the simple visual reaction times of boxers and wrestlers, the effects of both branch trainings on the reaction time were tried to be determined.

## MATERIAL AND METHODS

**Participants:** This research was carried out with the participation of 30 male athletes between the ages of 14-17. It was held with the participation of a total of 30 male athletes, including 15 boxers and 15 wrestlers, who have been licensed contestants for at least three years and are still actively participating in the competitions.

**Measurements:** The heights of the participants were measured with a wall-mounted stadiometer (Holtain Ltd. England), their body weights were measured with an electronic scale (Seca, Germany), and their visual simple reaction time performance was measured with a Reaction Time device (Hubbard Scientific 6027). Before the visual simple reaction time test, all athletes followed the usual pre-training warm-up protocol. After the warm-up phase, visual simple reaction time performance measurements of the athletes were taken in accordance with the protocol<sup>6</sup>. Data were analyzed with the IBM Statistics (SPSS, ver. 22.0, Armonk, NY) program.

**Statistical Analysis:** Data were analyzed with the IBM Statistics (SPSS, ver. 22.0, Armonk, NY) program. By using descriptive statistics, the continuous variables of the participants were compared as minimum and maximum, mean±standard deviation ( $\bar{x}\pm s$ ).

## RESULTS

The findings of the boxing and wrestling groups are given in table below.

Table 1: Average Values of Participant's Age, Height, Body Weight and Reaction Time Variables

Grup	Age	Height	Weight	Reaction	
Boxing	N	15	15	15	
	Minimum	14,00	170,00	52,00	20,00
	Maximum	17,00	183,00	82,00	29,00
	Mean	15,4667	175,5333	61,0000	23,6667
	Std. Deviation	1,06010	4,18956	8,03563	2,99205
Wrestling	N	15	15	15	
	Minimum	14,00	165,00	52,00	21,00
	Maximum	17,00	180,00	85,00	30,00
	Mean	15,4000	170,4667	62,8000	25,9333
	Std. Deviation	1,12122	4,29063	8,65365	2,68506

In Table 1, the mean age of the boxing group (N=15) was 15.46±1.06, the mean height was 175.53±4.18, the mean body weight was 61.00±8.03 and the mean reaction time was 23.66±2.99. The mean age of the wrestling group (N=15) was 15.40±1.12, the mean height was 170.46±4.29, the mean body weight was 62.80±8.65 and the mean reaction time was 25.93±2.68.

## DISCUSSION

Reaction time studies have been in the focus of attention of sports scientists since ancient times. In the literature, it is seen that especially the reaction time is tried to be shortened with mental and physical training practices. The number of studies investigating how the sport quitting affects the reaction time performance of the athletes is very few. Therefore, in this study, it was tried to determine the effects of both branch trainings on the reaction time by comparing the simple visual reaction times of boxers and

wrestlers.

Success in combat sports generally depends on speed of movement, joint mobility and reaction time<sup>22,23</sup>. Reaction time varies depending on factors such as age, gender, training status, fatigue, alcohol, nicotine, and psychotropic substance use<sup>9</sup>. Therefore, care was taken to select the participant groups of this study from the same age group, same sex, same training age, and those who did not use substances such as alcohol, nicotine, and drugs.

In this research the mean visual simple reaction time performance of the boxing group, whose mean age was 15.46±1.06, mean height was 175.53±4.18 and mean body weight was 61.00±8.03 was found to be 23.66±2.99. The mean visual simple reaction time performance of the wrestling group, whose mean age was 15.40±1.12, mean height was 170.46±4.29 and mean body weight was 62.80±8.65 was found to be 25.93±2.68. Based on these data, it can be said that boxing training is more effective in shortening reaction time performance compared to wrestling training.

When the studies comparing the physical performance parameters of boxers and wrestlers were examined, it was reported that the relative strength of the wrestlers was higher than that of the boxers<sup>24,27</sup>, but their sprint performance was lower<sup>25</sup>. It has also been reported that the flexibility performance of wrestlers is higher than that of kickboxers<sup>26,28,29,30</sup>. There was no study comparing the visual simple reaction performances of boxers and wrestlers.

## CONCLUSION

In this study comparing the visual simple reaction time performances of boxers and wrestlers, it was concluded that boxing training is more effective in shortening reaction time performance compared to wrestling training. In future studies on this subject, it may be recommended to conduct research with a larger number of participants. In addition, conducting studies with participants from different age groups will make new contributions to the literature. In addition, it is suggested that researches should be carried out on other combat sports branches.

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