

Reaction Time Comparison Of Young Volleyball Players In Smasher And Setter Positions

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ABSTRACT

This study was carried out to determine auditory and visual reaction time of male and female volleyball players in smasher and setter positions aged 15-17 and to analyze their differences. Measurements of volleyball teams were made on 13 teams and 133 athletes one day before the first competitions of youth group in Afyonkarahisar. The test was done with Power Newtest 2000 device and was described to the players in details. To evaluate the auditory and visual reaction times, measurements were made three times for each athletes and the best degree was evaluated. The obtained data were analyzed with SPSS 17.0 for Windows program and the dependent variables were performed by Covariance (Ancova) analysis. The average of the right hand visual reaction time of female setter was 236 mls while the reaction time of the male setter was 248 mls. Average left hand visual reaction time of female setter was 211 mls while it was 233 mls for male setter. Right hand average auditory reaction time of female setter was 200 mls while it was 206 mls for male setter. Average left hand auditory reaction time of female setter was 199 mls while it was 203 mls for male setter. Average right hand visual reaction time of female smasher was 237 mls while it was 248 mls for male smasher. Average left hand visual reaction time of female smasher was 222 mls while it was 227 mls for male smasher. Average right hand auditory reaction time of female smasher was 201 mls while it was 187 mls for male smasher. Average left hand auditory reaction of female smasher was 199 mls while it was 196 mls for male smasher. In conclusion, differences between auditory reaction time of right hand of male setter and male smasher are found to be statically significant.

Keywords: *reaction time, volleyball, smasher, setter*

INTRODUCTION

Volleyball has a high tempo; it is a dynamic and physical game which doesn't have a definite duration, and based on speed, power, dynamism, flexibility, endurance and jumping (Ergül, 1995). Reaction time and hand-eye coordination are the other important parts of this game (Bayar et al.1992). Reaction time is a hereditary aspect that determines the time period between a signal and individual's muscular reaction or activity towards it. In other words, reaction time is the period between the appearance of a rapid signal without a predecessor and the answer given to it. Reaction time is a decisive factor in many sports and can be developed by regular training (Bonpa, 1998). In volleyball, different, fast and successive movements are required in fast changing game positions; and various different actions are fit into a short amount of time. A setter has to be ready for quick thinking and creating various solutions to a good or bad pump; a smasher has to have a good approach and a reaction time against after-attack blocked balls which is accepted to be one of the most important aspects of volleyball players (Fröhner, 1999).

In volleyball, every team tries to end the action with a strong hit in order to win the game. On the other hand, a good pass is crucial in order to make an effective hit.

This study was carried out to determine auditory and visual reaction time of male and female volleyball players in smasher and setter positions aged 15-17, and to present their differences.

MATERIALS AND METHODS

29 smashers and 15 setters from 5 male teams and 49 smashers and 20 setters from 8 female teams which attended the Group Championship Volleyball Games, voluntarily participated in this study. Totally 113 volleyball players were in the study.

In order to measure the reaction time, Power 2000 New Test Simple Reaction Time Measuring device was used. Measuring device: The device has the aspect of measuring both the light and sound reaction time and can show the results on screen. In order to react as fast as possible to the stimulus sent by a sensitive button, experiment subject touched the button in front of him with his/her hand. Electronic brain of the device is made of an electronic chronometer which measures the reaction time between the light or sound stimulus and answer in terms of milliseconds (msec) and shows the result on digital screen.

All players were informed about how does the power 2000 New Test device work and how will all of the measurements be made; in order to ensure learning, test measurements were conducted on all of the members of study group. Measurement environment was quiet, airy and there were no distracters. During tests, players successfully carried out the test's directives and were encouraged to have the maximum attention. Measurements were done one day before the games.

Data of this research are analyzed with SPSS 17.0 Windows Program. Comparison of the research sampling group in terms of visual and audible reaction times according to sex and positions is made with Covariance (Ancova) analysis and meaningfulness level is determined to be 0.05.

RESULTS

Table: 1 Comparison of male and female volleyball players' reaction times

Variable	Sex	N	Average	Standard Deviation	F	Significance
Visual Right	Female	69	237.015	42.558	0.002	0.964
	Male	44	248.205	45.274		
Visual Left	Female	69	218.899	31.188	0.908	0.343
	Male	44	229.546	32.972		
Audible Right	Female	69	201.551	43.048	0.464	0.497
	Male	44	194.114	35.499		
Audible Left	Female	69	199.377	40.678	0.001	0.973
	Male	44	198.796	35.531		

Results of the comparisons between male and female players visual right, visual left, audible right and audible left reaction times showed that, there wasn't a meaningful difference in terms of sex. While some female volleyball players gave reactions in shorter times in visual right and visual left; male volleyball players gave reactions in shorter times to audible right and audible left stimulus.

Table 2: Comparison of female setters and smashers in terms of reaction times

Variable	Position	N	Average	Standard Deviation	F	Significance
Visual Right	Setter	20	236.900	50.697	0.207	0.650
	Smasher	49	237.061	39.352		
Visual Left	Setter	20	211.050	26.550	1.096	0.299
	Smasher	49	222.102	32.602		
Audible Right	Setter	20	200.750	44.036	0.830	0.366
	Smasher	49	201.878	43.098		
Audible Left	Setter	20	199.500	41.868	0.336	0.564
	Smasher	49	199.327	40.624		

There wasn't a statistically meaningful difference between reaction times of female setters and smashers in terms of visual right and left, and audible right and left ($p>0.05$).

Table 3: Comparison of male and female setters in terms of reaction times

Variable	Sex	N	Average	Standard Deviation	F	Significance
Visual Right	Female	20	236.900	50.697	0.005	0.942
	Male	15	248.333	47.873		
Visual Left	Female	20	211.050	26.550	0.718	0.404
	Male	15	233.866	37.210		
Audible Right	Female	20	200.750	44.036	1.425	0.242
	Male	15	206.267	43.557		
Audible Left	Female	20	199.500	41.868	0.060	0.809
	Male	15	203.867	38.919		

There wasn't a statistically meaningful difference between reaction times of male and female setters in terms of visual right and left, and audible right and left ($p>0.05$).

Table 4: Comparison of male and female smashers in terms of reaction times

Variable	Sex	N	Average	Standard Deviation	F	Significance
Visual Right	Female	49	237.061	39.352	0.137	0.712
	Male	29	248.138	44.743		
Visual Left	Female	49	222.102	32.602	0.454	0.502
	Male	29	227.310	31.019		
Audible Right	Female	49	201.878	43.098	0.004	0.951
	Male	29	187.828	29.439		
Audible Left	Female	49	199.327	40.624	0.050	0.823
	Male	29	196.172	34.067		

There wasn't a statistically meaningful difference between reaction times of male setters and smashers in terms of visual right and left, and audible right and left ($p>0.05$).

Table 5: Comparison of Male Setters and Smashers according to their reaction time

Variable	Position	N	Average	Standard Deviation	F	Significance
Visual Right	Setter	15	248.333	47.873	0.201	0.656
	Smasher	29	248.138	44.743		
Visual Left	Setter	15	233.867	37.210	0.001	0.972
	Smasher	29	227.310	31.019		
Audible Right	Setter	15	206.267	43.557	5.325	0.027*
	Smasher	29	187.828	29.439		
Audible Left	Setter	15	203.867	38.919	1.277	0.266
	Smasher	29	196.172	34.067		

It is determined that while there wasn't a statistically meaningful difference between reaction times of male setters and smashers in terms of visual right and left, and audible left, there was a statistically meaningful difference between male setter and smashers in terms of audible right hand reaction time ($p < 0.05$).

DISCUSSION AND CONCLUSION

Analysis of audible and visual reaction times of 15-17 aged male and female volleyball players in terms of smasher and setter positions, and presentation of their differences were the goals of this study whose findings were evaluated by correlating with the present literature.

It is seen in our study that female volleyball players' visual reaction times were shorter than male players. Related with this, Silverman mentioned that male advantage in visual reaction time is decreasing (Silverman 2006). On the other hand, Reimersa and Maylora showed that in terms of reaction time, there is an interaction between retries and sex, and although female players are slower at the beginning, when they face an obstacle, they move faster than males (Reimersa et.al. 2011). Besides this, Gürsoy found out that hand-eye reaction time is significantly lower than women (Gürsoy, 2010). On the other hand, in this study, although audible reaction time of male aren't found to be significantly meaningful, these values are better than female.

Female reaction time values in Akarsu's study are higher than the values in our study (Akarsu 2008). Önder found out that big league female players' left hand visual and audible reaction time is better than their right hand visual and audible reaction time (Önder, 2008). Besides the parallelism between this result and our study's result, it is seen that big league players' reactions are faster. In respect to this, More et al. mentioned that successful players are better than the others in reaction time measurements (More et. al. 1992).

In Koç and Aslan's study, they measured the reaction time values of 12 aged male players who attend the trainings regularly at least for 3 years; the values they measured are lower than the values of this study (Koç et. al 2010). Factors such as age, attention, warm up and regular training can be the causes of low values. Davranche, Burle, Audiffren and Hasbroucq showed in their study that training develops reaction time performance (Davranche et. al. 2006). On the other hand, Polat mentioned that values of individuals that keep in training are better than the values of sedentary (Polat, 2000). Duyul determined that university student male volleyball players' right hand visual reaction time is better than their left hand visual reaction time; and left hand audible reaction time is better than right hand audible reaction time (Duyul 2005). The values of Duyul's study are lower than the values in our study which brings into the minds that age factor can be effective. Marancı and Müniroğlu made a research on soccer goalkeepers and other players; at the end of the research, it was determined that goalkeepers' reactions to visual and audible stimulus are better than the other players (Marancı et. al. 2001). These results are in parallel with our study. We can explain this situation as; like goalkeepers in team sports, in volleyball, smashers are tactically and technically very well developed players as they can give fast decisions, move fast, and estimate the ball's incidence angle.

In our study, while it is found that there isn't a statistically meaningful difference between male setters and smashers' visual right, visual left and audible right, audible left reaction times; a statistically significant difference was found to be between male setters and smashers' audible right hand reaction time ($p < 0.05$). As a result, we can say

that smasher players are positively affected as struggles on the net, counter attacks to rapid balls after offenses are faster today with short pass, jet pass and lead pass.

RESOURCES

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