



## *Contribution Of Hand Reaction Speed And Feet Movement Speed With Table Tennis Playing Skills*

**Sahabuddin<sup>a,b,c,d,e\*</sup>, Hikmad Hakim<sup>a,b,c,e</sup>, Muslim<sup>b,c,e</sup>**

Sports Coaching Education Study Program, Faculty of Sports Science, Universitas Negeri Makassar,  
Jalan Wijaya Kusuma Raya No. 14 Makassar, Sulawesi Selatan, 90222, Indonesia  
e-mail: [sahabuddin@unm.ac.id](mailto:sahabuddin@unm.ac.id), [hikmad.hakim@unm.ac.id](mailto:hikmad.hakim@unm.ac.id), [muslim@unm.ac.id](mailto:muslim@unm.ac.id)

### *Abstract*

*Table tennis is a very unique type of small ball game. This is because table tennis uses a small ball made of celluloid, lightweight, and uses a bat to hit. This game is played on a table bounded by a net at the center of the table. The purpose of this study was to determine the contribution of hand reaction speed and footwork speed to playing tennis skills. This research belongs to the type of descriptive correlational research using a population of all male students state high school IMarioriawa Soppeng Regency with a total sample of 40 people selected by random sampling. The data analysis technique used is the correlation analysis technique using the SPSS version 22.00 system at a significant level of 95% or 0.05. Starting from the results of data analysis, this study concludes that: (1) Hand reaction speed has a contribution to playing tennis skills by 61.6%; (2) Footwork speed has a contribution to the skills of playing tennis by 72.4%; and (3) Hand reaction speed and footwork speed have a contribution to the skill of playing tennis by 73.9%.*

**Keywords:** *Speed, Foot Reaction, Footwork, Play, Table tennis*

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corresponding author: [sahabuddin@unm.ac.id](mailto:sahabuddin@unm.ac.id)

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## **A. Introduction**

Good exercise will make the body healthy and fit, as well as build people's ability to excel in sports. This should not be left behind. ([Indresti 2017](#)). This provides an understanding of the importance of sports education for the community. It is realized that in carrying out activities, they can be adjusted to the abilities possessed ([Sari 2017](#)).

The sport of tennis can be played by all age groups ([Dahrial 2021](#)). Tennis is a sport that knows no age or gender ([Syamsuddin, Hamdiana, and Ulfa 2018](#)). This means that it can be played by every age group, both male and female. It can be considered a recreational game ([Aprianto 2016](#)), but it can also be a sport that has techniques that must be studied and tackled seriously (trained) ([Syamsuddin, Musfira, and Hammado 2020](#)). The public's enthusiasm for this sport is quite large and can be played regardless of gender ([Nopiyanto et al. 2021](#)). It is possible that there are seeds of athletes who can be nurtured towards an achievement. The fondness for playing table tennis is shown by the number of tennis courts ([Yulianto 2015](#)), which are intentionally made to be played in the yard ([Aprianto 2016](#)). Therefore, it is necessary to hold better coaching ([Sahabuddin, Hakim,](#)

[and Syahrudin 2020](#)). To play the game, one must master basic techniques and physical and psychological conditions ([Amalia 2018](#), [Liskustyawati 2017](#)). Readiness and steady mastery of techniques and tactics are needed in skill achievement ([Nopiyanto et al. 2021](#)). Readiness and stability determine the success of achievement ([Aprianto 2016](#)). Without mastery of technique and tactics, peak performance is difficult to achieve ([Sahabuddin 2017](#)). Efforts to realize the expected collaboration between the community and the government or the private sector through the provision of adequate facilities and infrastructure ([Nuridin and Aminullah 2020](#)) in order to improve the quality of this sport ([Hammado et al. 2020](#)).

The game of table tennis requires fast movements according to the speed of the ball ([Suhendro 2016](#)), requires precise movement control, fast reactions, and accuracy of strokes ([Paksi 2016](#)). If it is done, it will appear that the movement of the punches made is efficient ([Suparman and Hasbillah 2021](#)). Movements in playing table tennis are motor reactions ([Putri and Ardisasmita 2019](#)) resulting from the process of auditory stimulation, nerve commands through information processing

in the nervous system ([Suwo 2018](#)). The process of hitting the ball and when anticipating the opponent's blow begins with hearing the ball bounce ([Dahrial 2021](#)), attention or vision of the ball being hit, an order will arise from the spinal nerve to respond in the form of a movement to hit the ball to return the ball to the opponent ([Wibowo 2015](#)).

Effectiveness in hitting a table tennis player requires physical conditions ([Sari and Antoni 2020](#)). The ability to perform a variety of strokes such as serve, forehand, backhand, topspin, backspin, drive, and loop, can be produced well ([Asri, Soegiyanto, and Mukarromah 2017](#)). The element of the physical condition of the reaction plays a very large role in determining the quality of the movement to play tennis ([Rozy 2015](#)). Hand reaction speed in table tennis is a must for players to attack and defend at the same time ([Suparman and Hasbillah 2021](#)). Having a fast hand reaction ([Irawan 2019](#)) will make it easier to reach difficult balls placed by the opposing party and at the same time make a counterattack by hitting both forehand and backhand ([Atmaja and Tomoliyus 2015](#)). Likewise, the speed of footwork is the part that supports the movement of the rate of motion of each ball ([Paksi 2016](#)). The speed

of footwork aims to anticipate the incoming stimulus ([Santoso 2015](#)). Having the speed of foot movement makes it easier to respond ([Suryati et al. 2020](#)) in anticipating the incoming stimulus. Mastery of footwork speed will have an impact on the movements made when returning an opponent's attack or when carrying out an attack ([Astrawan and Jaya 2019](#)).

## **B. Method**

The research method is a descriptive correlational method, focusing on two variables, namely the independent variable consisting of the speed of the hand reaction and the speed of the foot reaction, while the dependent variable is the skill of playing tennis. The research design or research design used is correlational. The population in this study were students of SMA Negeri 1 Marioriawa in class XI, totaling 120 people. The sample used was male students, as many as 40 people from 30% of the population. The sampling technique used was random sampling. The data collected in this study included: hand reaction speed tests, footwork speed tests, and table tennis playing skills. The data analysis technique used was correlational and regression with a significant level of 95% or 0.05.

**C. Result and Discussion**

The research data obtained were analyzed by descriptive statistics which include; total value, average, range, maximum and minimum. The descriptive

statistical values give a general description of the state of the data for each research variable. More details can be seen in Table 1.

**Table 1.**  
**Descriptive Data Results for Each Variable**

Variable / Statistic	N	Sum	Mean	Stdv	Min.	Max.
Hand reaction speed	40	752,0	18,80	2,8573	14,00	24,00
Footwork speed	40	926,0	23,15	2,2136	19,00	27,00
Skills for playing table tennis	40	1278,0	31,95	2,4279	25,00	36,00

The results of the descriptive data analysis in table 1 are an overview of each variable studied. The data is not the answer to the hypothesis analysis about the independent variables consisting of the speed of hand reaction, and the speed of footwork on the dependent variable in the form of playing tennis skills. Furthermore,

the description of the distribution of data for each research variable then tests the normality of the data using the Kolmogorov Smirnov Test (KS-Z). The results of the data normality analysis can be seen in Table 2 below:

**Tabel 2.**  
**Normality Test Data Results for Each Variable**

Variabel	K – SZ	P	$\alpha$	Ket.
Hand reaction speed	0,863	0,446	0,05	Normal
Footwork speed	0,946	0,333	0,05	Normal
Skills for playing table tennis	0,843	0,477	0,05	Normal

**1. There is a contribution of hand reaction speed to table tennis playing skills.**

The results of the data obtained from

data processing through correlation and regression analysis using the application of the SPSS program on the first hypothesis can be seen in Table 3 below:

**Table 3.**  
**Results Of The Analysis For The First Hypothesis**

VARIABEL	r/R	Rs	F	t	Sig.
Hand reaction speed (X1)	-0,785	0,616	61,037	-7,813	0,000
Skills for playing table tennis (Y)					

Test result:

Based on the results of the data analysis test in Table 3 above, it shows that the speed of hand reaction to the skills of playing table tennis shows that the correlation value is -0.785 with probability  $(0.000) < 0.05$ . The value of R Square or the coefficient of determination is 0.616. The results show that 61.6% of table tennis playing skills are explained by hand reaction speed. For the Anova test or F test, the value is 61.037 with a significance level of 0.000. The probability value  $(0.000) < 0.05$ , then the regression results can be applied to the population where the sample is taken to predict the skills of playing tennis. While the results of the t-test value obtained were -7.813, with a significance level of 0.000

which is much smaller than 0.05. So  $H_0$  is rejected and  $H_1$  is accepted or the speed of hand reaction has a significant effect on playing tennis skills. Thus it can be concluded that the speed of hand reaction has contributed to the skills of playing tennis in SMA Negeri 1 Marioriaawa Soppeng Regency by 61.6%.

**2. There is a contribution of footwork speed to the skill of playing table tennis.**

The results of the data obtained from data processing through correlation and regression analysis using the application of the SPSS program on the second hypothesis can be seen in Table 4 below:

**Table 4.**  
**Results Of The Analysis For The Second Hypothesis**

VARIABEL	r/R	Rs	F	t	Sig.
Footwork speed (X2)	0,851	0,724	99,486	9,974	0,000
Skills for playing table tennis (Y)					

Test result:

Based on the results of the data analysis test in Table 4 above, it shows that the speed of footwork on the skills of playing table tennis

shows that the correlation value is 0.851 with probability  $(0.000) < 0.05$ . The value of R Square or the coefficient of determination is 0.724. The results show that 72.4% of

table tennis skills are explained by footwork speed. For the Anova test or F test, the value is 99.486 with a significance level of 0.000. The probability value (0.000) < from 0.05, then the regression results can be applied to the population where the sample is taken to predict the skills of playing tennis. While the results of the t-test value were obtained at 9.974, with a significance level of 0.000 which is much smaller than 0.05. So Ho is rejected and H1 is accepted, or the speed of footwork has a significant effect on playing tennis skills. Thus, it can be concluded that

the speed of footwork has contributed to the playing of tennis skills in students of SMA Negeri 1 Marioriawa, Soppeng Regency by 72.4%.

**3. There is a contribution of hand reaction speed and footwork speed to table tennis playing skill**

The results of the data obtained from data processing through correlation and regression analysis using the application of the SPSS program on the third hypothesis can be seen in Table 5 below:

**Table 5.**  
**Results Of The Analysis For The Third Hypothesis**

VARIABLE	r/R	Rs	F	t	Sig.
Hand reaction speed (X1) and Footwork speed (X2) Skills for playing table tennis (Y)	0,859	0,739	52,249	3,010	0,005

Test result:  
 Based on the results of the data analysis test in Table 5 above, it shows that the reaction speed of the hands and the speed of footwork on the skills of playing table tennis shows that the correlation value is 0.859 with probability (0.000) < 0.05. The value of R Square or the coefficient of determination is 0.739. The results show that 73.9% of table tennis skills are explained by the reaction speed of the hands and the speed of footwork. For the Anova test or F test, the value is 52.249 with a significance level of 0.000. The probability value (0.000) < from

0.05, then the regression results can be applied to the population where the sample is taken to predict the skills of playing tennis. Meanwhile, the result of the t-test value is 3.010, with a significance level of 0.000, which is much smaller than 0.05. Then Ho is rejected and H1 is accepted. Or, the reaction speed of the hands and the speed of footwork have a significant effect on the skills of playing tennis. Thus it can be concluded that the reaction speed of the hands and the speed of footwork have contributed to the skills of playing tennis in SMA Negeri 1 Marioriawa Soppeng

Regency by 73.9%.

## **Discussion**

### **1. There is a contribution of hand reaction speed to table tennis playing skills.**

The results of the statistical analysis of the data previously disclosed show that the speed of hand reaction has a contribution to the skills of playing tennis in SMA Negeri 1 Marioriawa Soppeng Regency. Performing the skills of playing tennis, all of which require several inputs to be seen, then these inputs are integrated into motor movements as outputs so that the result is a maximally coordinated movement. The skill of playing tennis with various forehand and backhand strokes for students must be supported by the speed of reaction in carrying out every move. Every movement in table tennis is very fast and must be anticipated ([Wibowo 2015](#)). The reaction of the fast movement of the hands supports the strokes made. Hand reaction speed is a movement that occurs from information that is integrated into the movement of the limbs ([Syamsuddin et al. 2018](#)). All hand movements when striking in table tennis must be controlled with precise eyesight. The speed of hand reaction in the game of table tennis will be very influential when launching a shot or anticipating the

arrival of the ball ([Suwo 2018](#)). The returning ball will not come to the player, but the player must respond more to see the ball coming and then anticipate it being returned optimally. Therefore, students who have good hand-eye coordination will move faster to anticipate the ball in the game of table tennis.

### **2. There is a contribution of footwork speed to the skill of playing table tennis**

The results of the statistical analysis data previously disclosed show that footwork speed has a contribution to the skills of playing tennis in SMA Negeri 1 Marioriawa Soppeng Regency students. The speed of the footwork supports the movement in making forehand and backhand strokes in table tennis games. Movement in very fast tennis will certainly require anticipation of movement with fast feet. Shifts made on the feet will affect the position of the body so it can perform optimal strokes. Because the position of the body will be carried over to the position of the foot movement. So the punches made will be efficient if the foot movements can be placed quickly or react by following the ball's speed ([Irawan 2019](#)). The agility of a student will have an impact on footwork. A student displays both

forehand and backhand strokes by maintaining and responding to every ball speed, which can be anticipated if he has good footwork speed. The accuracy of a hit to place on the opponent or anticipate the arrival of the ball must always move quickly. Students anticipate the arrival of the ball by adjusting their footwork ([Sari 2017](#)) so that they place a more accurate and sharper ball in their attack ([Santoso 2015](#)). The movement of each student to achieve the skill of playing table tennis is also always determined by the position of the legs or feet. As each ball is picked up, the legs will move forever to create a better ball movement, and then move back into the ready position.

### **3. There is a contribution of hand reaction speed and footwork speed to table tennis playing skill**

The results of statistical analysis showed that there was a contribution of hand reaction speed and footwork speed to the skills of playing tennis in SMA Negeri 1 Marioriawa Soppeng Regency students. The game of table tennis is one of the most agile and adaptable sports because the ball that is played is very light and fast. Movement in the game of table tennis requires a person to be able to anticipate the arrival and return of

the ball that is hit both forehand and backhand. The physical needs possessed by students at SMA Negeri 1 Marioriawa, Soppeng Regency, which are the research materials, are factors that support the achievement of playing tennis skills. Hand reaction speed, for example, is a must to have. Because the movement in the game of tennis requires a faster reaction ([Suhendro 2016](#)) to anticipate the speed of the ball's arrival and to return the ball more accurately. Likewise, the position of the foot will greatly affect the blow that is launched. The speed of the footwork affects the optimal stroke motion in the game of table tennis. Therefore, students of SMA Negeri 1 Marioriawa, Soppeng Regency, have the element of the speed of hand reaction and the speed of footwork together in good condition, able to carry out the entire series in the implementation of the technique of playing tennis skills. Every movement that occurs will always require a good response ([Nopiyanto et al. 2021](#)), from players who move quickly depending on the arrival of the ball. Thus, the reaction speed of the hands and the speed of footwork have a contribution to the skills of playing tennis.

### **D. Conclusion**

Based on the results of the research

that has been stated, it can be concluded that hand reaction speed and footwork speed have a contribution to the skills of playing tennis in SMA Negeri 1 Marioriawa Soppeng Regency.

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### F. Conflict Of Interest

All authors state that there is no conflict of interest in this article.

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