

# Linear regression for visual selective attention (reaction speed and control) accurately performing volleyball defensive technical skills

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***Abstract: The individual's efficiency in performance such as problem solving or the time it takes to perform a task depends on his mental abilities, and what needs arise according to its size, and the accuracy of its complexity, to include simple and complex mental activities, including visual selective attention. In addition to the extent of its precise contribution to volleyball defensive skills, the students of the College of Physical Education and Sports Sciences, the third stage, numbered (78) applications from the third stage. They were randomly selected by a percentage of (39.59%) of the total number (197).***

***That the highest correlation of the first order with the skill of reception, and then the skill of the wall of block ranked second, and in the end, the skill of defending the court ranked third in terms of the value of the correlation coefficient, and that all the correlations were significant, because the error rates are less than the significance level (0.05) and the degree of freedom (76) with a percentage of confidence of (55.8%) for visual selective attention (reaction) to technical skills in defense in volleyball. Therefore, the researchers recommend conducting a similar study for different levels that include aspects of the current study. Standards and standard levels for the studied research variables.***

***Key words: selective visual attention with offensive technical skills.***

## **1. INTRODUCTION: -**

Various countries of the world have witnessed a great mathematical movement that results in tremendous technological and cognitive development, especially with regard to the amount of information, the type of capabilities required for performance, and the large amount of intellectual activity required in terms of mental and cognitive processes to process information and make decisions.

The billions of cells operate the sensory information and send what you see to higher centers in the brain, and this massive system of information operation generates a problem for higher levels of knowledge, namely, how to determine what you are interested in from among all the sensory information that is triggered, and that which system Information has a limited capacity to pass information in a certain period of time, because the human nervous system has a limited ability to direct attention, and this is due to the limited processing and processing capacity.

Visual selective attention is considered one of the mental processes that work to preserve arousal and prepare the mind to select a visual stimulus from among a number of other visual stimuli, and thus it is one of the factors affecting performance, whether at the level of law enforcement or defensive technical skills in volleyball, and this is what (Zaghloul referred to Al-Hindawi: 2015: 113), that is, their knowledge of what is going on around them on the field to the surrounding symbols and different personalities. Attention is one of the most important mental abilities, especially in the higher levels, as the player must pay attention to the variables of the play, and isolate himself from all surrounding stimuli, because any decrease in the level of attention leads to possible tactical and technical errors, which appear in the form of slow reactions and vice versa, attention It is "the process of directing and focusing the feeling on the sensations resulting from external stimuli present in the individual's perceptual environmental field or the internal stimuli that occur within the individual."

The measurement of an individual's competence in performance, such as solving problems or the time it takes to perform a task depends on his mental capabilities, and what needs arise according to their size, and the accuracy of their complexity, to include simple and complex mental activities, including selective visual attention. The study aimed to identify the relationship between selective attention. As well as the extent of its precise contribution to the defensive skills of volleyball, students of the Faculty of Physical Education and Sports Sciences, third stage. And that the importance of the research lies in the cognitive sub-processes and what has a major role in the accuracy of the performance of defense skills in volleyball, and Mathin: 79 refers to "carrying out a number of sub-cognitive operations more than what is required by other types of attention, such as: encoding, storing, and retrieving information. , As well as the processes of discrimination and selection, "and (Borsma: 2008: 18), and that" is the response of the individual to some stimuli associated with the situation, and the cessation of responding to other stimuli not related to the situation, or what is known as the dispersive stimuli. "

## **2. RESEARCH METHODOLOGY AND FIELD PROCEDURES:**

Research Methodology:

The researchers used the descriptive approach with survey method and correlational relationships

Community and sample research:

The researchers selected the research community using the sampling method, which was represented by the third stage students in the College of Physical Education and Sports Sciences - Diyala University for the academic year (2017-2018), and their number was (197) students only, and their names were listed in the official lists of the Registration Division, and the research samples were chosen. Randomly disorganized (lottery) and divided into.

- The survey sample whose number was (25) with a percentage of (12.69%).
- The actual application sample and their number was (78) with a percentage of (39.59%).
- A sample was excluded and their number was (84), with a percentage of (42.63%).

Devices used in the research:

(1) Canon camera.

Dell laptop.

Rehecom Selective Attention (GONT).

The researchers used the German-made Rehecom test system for examination and evaluation (Rehecom), one of the most important psychological laboratory systems for the Center for Educational Studies and Psychological Research at the Presidency of the University of Baghdad. , Programs, and measurements, by employing the latest technology in the modern era, and the system provides very accurate and objective results, free of errors, as it measures values that cannot be measured by paper, pen, and observation.

The system was widely used in many countries of the world, but it did not enter Iraq until the end of 2017, after a great effort made by the director of the laboratory, Dr. (Hoda Jamil Abdul-Ghani), to become the first in the field of complex and in-depth tests, as it surpassed the Austrian Vienna System in the number of tests and programs by more Of (13) exams and programs, which are owned by the Iraqi Student Foundation, which is supervised by Professor (Ali Jawad).

The center of gravity of the system is the software that represents (85%) of the computing power and is based on multiple training programs and various tests in the fields of psychological, mental and medical examination and rehabilitation.

The mental ability test (visual selective attention) has been designed so that the subject can follow the electronic screen, the digital scoreboard, and the buttons for (control) objectively and accurately, and then process the information electronically, as (selective attention) is considered in two parts the speed of reaction and control of the speed of reaction One of the main and essential factors for many activities in the sports field.

Defining search variables:

For the purpose of determining the research variables, the researchers used a set of tests, through which it is possible to collect information about individuals, to arrive at a true and proper comparison between them.

Visual selective attention test:

The researchers conducted the visual selective attention test after reviewing the system and its apparatus and parts, and by using the operator concerned, and after conducting the interview (\*) and direct inquiry, the researchers were able to know in detail and accurately the device, how the test was conducted, and the extent of the device's ability to measure the mental ability of constraint. Research, with the possibility of applying this test to students, through which the researcher will be able to identify the variables that the visual selective attention test measures, namely:

-Rapid reaction.

-Reaction speed control.



Rehcam system for examination and evaluation

Which is one of the important and basic requirements in the game of volleyball, which is characterized by speed and accuracy in performance, as well as the short time of contact with the ball, the smallness of the field compared to other different games, as well as the diversity of technical skills and tactical defensive styles

In order for researchers to be able to keep pace with the great development in the field of measurement and evaluation, and in the absence of an objective and accurate test that gives real results for the mental ability used in the research, the advanced system that is subject to the highest international quality standards (Rehacom) with the scientific symbol (GONT) in measurement was used.

Specifications of the visual selective attention test:

The subject sits in front of the device on a chair that can be adjusted in height and according to the necessity, so that the gaze is directed straight ahead towards the black electronic screen, then the subject places the index finger close to the green control button and the subject is within the moving keyboard, which can be changed to be under the finger directly.

Test stages:

The test stages in the (REHICAM) system are similar to some extent the test stages in the (Vienna) system (VTS), as they have three stages as well, but they may in terms of detailing the ability to its basic components:

1. Instruction stage:

The direct supervisor of the device gives detailed information to the subjects on how to use the device, what stimuli will appear, and what is the method followed to obtain the best

results by confirming that the subject has prepared all his capabilities in line with the speed and accuracy of the device.

## 2. Training phase:

It is the stage that meets the instructions stage, as the subject performs the exercise on how to perform the test for a period of one minute that the device determines for the examined in advance, at this stage the device does not give the subject another opportunity to train or review the instructions, as is the case with the (Vienna) system, as the system stops After the subject committed three errors, or did not respond within (5) minutes, which confirms the accuracy and high objectivity of the modern system.

## 3. The test phase:

The test phase takes place one minute after the specific training phase, as the subject should press the green button on the keyboard when the green square divided into white rectangles appears, according to the direction that the device pre-sets, horizontal or vertical, for example if the device previously asked the subject to respond to the square The one who has vertical rectangles and neglects the square with the horizontal rectangles, the speed of reaction and control of the reaction must be concentrated around the vertical rectangles only among several possibilities that the device gives to the subject randomly, and after the completion of the test the responses are transferred to the computer, which in turn transmits them to the device's printer. Then the final report appears, and it contains all the information related to the subject, in the following sequence:

History Data - Correct Answers - Mistakes - Omissions - Outliers - Forecasts - Anticipations - Avgreac Reaction Time Rate. Time (ms) - Median Reac. Time (ms) - standard deviation SDR eac. Time (ms) - Zvalue React Speed - Zvalue (for control) Zvalue React Control.

As for the graph, it shows the time in milliseconds, divided from (zero) to (600), as well as the frequency of the stimulus sequence.

## Tests used in research

Through the researchers reviewing many studies and research that looked at measurement and evaluation of volleyball, and surveying many references, he found the most standardized and used tests by many sources and on the same types of samples.

### **3. THE MAIN EXPERIENCE**

After the results of the exploratory experiments confirmed the safety and correctness of the implemented procedures and included in the scientific conditions and specifications for the tests as well as the suitability of the research sample, skill tests were applied to the main application sample, consisting of (78) students from all the people, and they were randomly selected for the accuracy of the study description, for a period of (10/3) / 2019) until (5/13/2019).

- Presentation, analysis and discussion of the results of linear regression of the variables of selective visual attention and defensive technical skills in volleyball:

For the purpose of obtaining a predictive value for selective visual attention, and volleyball defensive skills, the researchers used the partial regression equation, through which it can be predicted, as "prediction is one of the most important purposes of regression study, meaning estimating (or predicting) the value of a variable if the value of another variable is known." (Al-Yasiri Muhammad Jassim: 2001: 217).

Table 1 shows the statistical description of selective visual attention and volleyball defense skills.

Variables	measuring unit	A	STD	Standard error	Mediator	Torsion
Selective attention	Degree	58.897	7.074	0.801	60.000	0.194
Blocking wall	Degree	6.526	1.256	0.142	6.000	0.405
Reception	Degree	51.013	8.900	1.008	50.000	0.745
The defense of the stadium	Degree	5.346	1.149	0.130	5.000	0.441

Table (1) shows descriptive statistics for the variables of selective attention (control), and the dependent variables, defensive skills in volleyball, and there are very important indicators that we can infer the moderation of the research sample on the standard error (kaus), which is that all values of the arithmetic mean were greater than the values of Standard deviations, in addition to the value of the standard error, which constitutes the second indicator of moderation, and finally the values of the torsion modulus, which ranged between ( $\pm 1$ ).

- Presentation of arithmetic mean results, standard deviations, correlation coefficient and their error ratio for variables of visual selective attention (reaction speed and control) and volleyball defense technical skills:

Table (2) shows the simple correlation coefficient and error ratios for control and volleyball defense skills.

Variables	measuring unit	A	STD	Correlation coefficient	Standard error
Visual selective attention	Degree	58.896	7.074	-	-
Blocking wall	Degree	6.526	1.256	0.521*	0.001
Reception	Degree	51.013	8.900	0.678*	0.000
The defense of the stadium	Degree	5.346	1.149	0.468*	0.025

Table (2) shows the values of the descriptive statistics of the research sample, and the simple correlation coefficient between visual selective attention and defensive technical skills with volleyball, and it turns out that the highest correlation was between visual selective attention and reception skill in the first rank, and then the block wall skill ranked second, and in the rank The third was with the skill of defending the field in terms of the value of the correlation

coefficient, and that all the correlations were significant, because the error rate is less than the significance level (0.05) and the degree of freedom (76).

- Presentation of the multiple correlation relationship, contribution ratio, standard error, and variance analysis of multiple regression to check the quality of the multiple linear regression model fit between variables of visual selective attention (reaction velocity and control) and volleyball defense technical skills:

Table (3) shows the multiple correlation coefficient, the assignment factor, and the standard error for an estimate of selective visual attention and volleyball defense skills.

Variables	Partial link	Appointment coefficient	Standard error	(F)	error percentage	Alienation coefficient	Confidence ratio
1	0.804	0.647	4.318	33.422	0.000	0.442	55.8

Table (3) shows the multiple correlation coefficient between visual spatial attention and defensive technical skills in volleyball, and the correlation was acceptable and in good proportion, reaching (0.804), which indicates the presence of an effect of the independent variable in the dependent variables.

To find out the magnitude of these coefficients and their significance, the researcher used the (F) test, as the results indicated that the calculated F value (F), respectively, is (33.422), which is a significant function with an error rate less than the significance level (0.05), and this is another evidence of an effect For visual selective attention to volleyball's defensive skills.

To show the confidence in the correlation coefficients calculated above, or to know the ability of one variable to predict the other variables, the researchers used the coefficient of estrangement, as the prediction evidence for the correlation coefficient computed was obtained, which expresses the percentage of confidence in the correlation coefficient calculated by the following equation:

$$\text{Prediction index of correlation coefficient} = 1 - \text{coefficient of alienation}$$

The results of using this equation resulted in a percentage of confidence in these transactions, reaching (55.8%) for selective attention to the technical skills of defensive volleyball.

- Presentation of fixed boundary and propensity values for visual selective attention (reaction velocity and control) and volleyball defense technical skills: its standard errors, its true level of significance, and the significance of differences:

Table (4) shows the multiple correlation coefficient, the assignment factor, and the standard error to estimate volleyball control and defensive skills.

Variables	Appointment coefficient	Standard error	T	error percentage
control	9.028	6.693	1.349	0.182
Blocking wall	0.850	0.075	11.373	0.000
Reception	0.049	0.058	0.841	0.403

The defense of the stadium	0.023-	0.445	0.071-	0.943
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Table (4) shows the significance of the regression coefficients only in the cognitive test variable by testing them with a value of (T), which appears to be a function at the level of significance (0.000), which indicates the high possibility of predicting the skill of the wall of blocking, and the researchers used the previous equation, which is called the linear regression equation, as regression expresses the possibility of predicting the dependent variable when there are values for the independent variable, while the rest of the variables for defensive technical skills had no effect, as the error rate showed greater than the level of significance (0.05).

Discussing the results of variables for visual selective attention (reaction speed and control) accurately performing volleyball defensive technical skills:

It can be seen from Table (4) that the percentage of the contribution of visual selective attention (control) to the speed of reaction with the accuracy of the performance of defensive skills: (blocking wall, reception, and defending the stadium) was good, and that the correlation coefficient were all significant.

The researchers believe that the accuracy of the defensive wall's skill does not differ in terms of controlling the reaction speed of the body and its parts with the offensive block wall, but there are influencing factors that delay the formation of the defensive wall, which causes it to necessarily tend to the defensive type, including what is related to the type of transmission for the two teams on the one hand. The level of strength, speed, and accuracy, if the transmission is weak, then the opportunity to select good reception will be great, which gives more space for the preparers to diversify the balls on the network, and then selective attention (control) in the reaction speed of the responders becomes weak, so the resort to a wall Defensive blocking would be the only solution, and vice versa.

Some of them are related to height, so whenever there are short stays within the team, the defensive blocking wall will be the best solution in the face of tall stature, in addition to the fact that short stature are often targeted by the preparers when they are on the network, because they represent weaknesses that can be exploited through Preparing the balls towards the positions they occupy, and then the defensive blocking wall will be penetrable by the hitters of the opposing team.

The control of reaction speed represents “the rapid realization of the understanding of motor duty with the matter of mathematical performance, as it appears in a short period of time that ends between the moment the stimulus appears and the end of the motor response to it.” (Qasim Hassan Hussein: 471: 2009)

The researchers believe that controlling the reaction speed of the body and its parts in the skill of receiving the transmission is closely related to the speed of movement of the ball in terms of rotation or ripple, and if the next ball from the transmission in a way (spin) has a high rotation, then the ability of (control) will be in one of three possibilities, either Facing

the ball directly, either leaning with the legs and arms to the sides, and then absorbing the momentum obtained with an appropriate reaction, but if the ball is (wavy) with a medium speed, the ability of selective attention (control) will be more evident through the availability of sufficient time to choose the response of the body and its parts, whether From the top with the fingers or from the bottom with the forearms, "Team games and individual matches need to implement quick responses in response to the different variables and situations that occur in play and the sudden changes in the speed and direction of the ball." (Jabbar Rahima: Article)

Finally, the percentage of the contribution of visual selective attention (control) to the speed of reaction with the accuracy of the skill of defending the field came fourth in terms of the correlation coefficient, and the researchers attribute this to the fact that the sample level has not yet reached the ability to (control) the speed of the good reaction of the body and its parts Defending the field requires the maximum degree of (control) reaction speed in terms of the deep stance of the two men, to obtain a low center of gravity, while trying to control the elbows bending to absorb the force and speed of the coming balls from the crushing strike of the opposing team.

"The defender in the volleyball when he tries to return the ball coming from the opponent in the crushing blow, he does not know the ball's speed and direction, and that (control) the reaction speed enables him to determine the direction and speed of the ball, and the quality of the response, so that he can play the ball before it touches the ground." (Zainab Abdel Rahim: 2013)

The researchers believe that selective attention (control) in the skill of defending the field depends on the form of transition on the field and according to the various types of skill, as the level (control) varies with the speed of the reaction between the simple slow balls of the third touch, or the direction known in advance, and the complex of the balls Which requires a change of direction or rush by sliding or diving to catch up with distant or near balls, which often touch the blocking wall or the colleague, and then go in a direction that is not known in advance. "The skill is one of the skills that is very difficult because it is based on a high level of physical fitness, and strength, Speed, agility, reaction speed, and the courage to save balls near and far. "(China Sport: 37: 1986).

The principle of specialization in modern volleyball has placed the defensive level of the teams at the highest stages (control) with the speed of reaction through the presence of the (free defender) (libero) who specializes in receiving and defending the field, and this is natural to achieve a balance between the advanced offensive ability and the defensive ability of the teams the competition.

"The specialization in the skill of defending the field requires the free player to have a high level of strength, reaction speed, long-term focus, endurance, and speed of movement response, as well as boldness and courage in using the body by rolling and slipping to save the balls, and a good tactical knowledge of the characteristics. Offensive opponent. " (Qatar Volleyball Federation: 1998: 9)

#### 4. CONCLUSION:

Through the findings of the researchers, it was concluded that there is a significant relationship between selective visual attention (control - reaction) and the performance of defensive technical skills in volleyball for students of the third stage of the Faculty of Physical Education and Sports Sciences, and there is a contribution of (64%) and a confidence rate of ( 55.8%) visual selective attention (control - reaction and defensive technical skills in volleyball for third-stage students of the College of Physical Education and Sports Sciences, as well as a positive effect of selective visual attention (control - reaction) for third-stage students of the College of Physical Education and Sports Sciences, Therefore, the researchers recommend conducting another similar study in light of the (psychological, functional) aspects of contributing to the progress and development of research and studies, and conducting a similar study for different levels that include aspects of the current study, and it is possible to devise the predictive equation for another purpose that can be used in the evaluation, in addition to setting standards and standard levels. For the studied search variables.

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