Journal of Humanities and Social Sciences Researches (JHSSR)

ISSN: 2958-3160 (Online)

Design and codification of a computer test that measures basketball players' motor response time and attention focus at the primary level

Assist. Prof. Dr Yosra Hasoon Mutashar*[1]

[1] Department of Physical Education and Sports Sciences, College of Education for Girls, Al-Qadisiyah University, Iraq.

* Corresponding author, Email: yosrahasoon@yahoo.com

Received: 28/03/2023 Accepted:25/05/2023

Abstract

Basketball is a popular sport across the world, as well as in the Arab world and nationally. This is due to its privileged position among sports worldwide, particularly following the rapid and significant development of assistive devices and modern technology used in development processes, as well as the contribution of recent studies and research to reveal the most important psychological factors affecting basketball players. Attention, focus, motor reaction, and other abilities associated with player skills, such as scoring accuracy, are instances of mental processes. Assessing such processes need contemporary testing, such as computers, which are distinguished by their precision in providing results and displaying the player's true score. As a result, research into establishing automated exams to evaluate them scientifically is critical. For example, measuring basketball players' motor response time and attention precision. The research question results from the fact that it is one of the issues that experts and trainers acknowledge during the training procedure. It is the method of measuring mental talents and assigning numerical values that are based on contemporary and accurate scientific foundations. This enables professionals to use them in practice, and we additionally lack accurate, objective examinations that depend on technological gear to measure them. Furthermore, if such evaluations exist, they lack criteria by which the coach may appraise the player's current state. The objective of this research is to construct and design a computer test to measure basketball players' motor response time and concentration of attention. Furthermore, it finds computerized exam requirements, results, and levels. The human field was represented by basketball players in the Baghdad Governorate, Al-Dhafar Elementary School, the sixth primary school and a temporal field was chosen for the academic season (2022-2023) in this study, while a spatial field was determined for the school's sports hall and yards. The researcher employed a descriptive strategy, and the research sample was included (46). The researcher reached the conclusion that she had created a computer system that measured motor reaction time and focused attention on basketball players. This occurred at the sixth primary stage. Furthermore, search the standards, grades, and levels for these assessments.

Keywords: Basketball, attention precision, computer test

https://10.33687/jhssr.002.02.000220

Introduction

Research importance:

Mental abilities are among the most significant factors studied in the research, and they utilize precedence in successful performance and positive results. Because the researcher's motor response time and focus of attention were important in all games, the individual focused her study on them. Basketball, in particular, necessitates a variety of mental abilities, including motor response and attention focus. It is difficult to assess these abilities in traditional ways. No tests were obtained or discovered to measure these abilities among basketball players in primary schools, according to the study's researchers.

As a result, the researcher decided to try and solve it using approaches and methods never used before. The researcher attempted to determine motor response time and attention focus. Because there are no objective tests that measure these two variables, the researcher decided to solve the problem using an electronic calculator. This was done to measure players' concentration and motor response time.

Research problem:

One of the challenges that specialists in training recognize is determining how to assess their mental abilities. This is accomplished by assigning numerical values to each one that will assist us in employing them. Additionally lacking are accurate, objective tests that rely on electronic devices to be measured. Furthermore, even if such tests are present, they lack criteria by which the coach can assess the player's current condition. As evidenced by a review of some tests published in specialized scientific journals and courses. In terms of time consumption, she believes it is insufficient for the purposes of measurement programs.

Research aims:

1. Preparing and designing a computer test to measure motor response time and attention focus for basketball players.
2. Finding standard scores and levels for the computerized basketball test.

Research areas:

The human field: a sample of basketball players and students at Al-Zafar Elementary School, Baghdad Governorate.

Time range: 2022-2023.

Spatial field: the school sports hall and yard.

Research Methodology and Procedures:

The research method used:

The researcher used the descriptive survey method due to its suitability and the nature of the study problem.

The research sample:

The research sample consisted of (46) basketball players, which constituted a percentage of (37.97%) of the total research community of (129) players.

Search tools

1 - Laptop computer (1): Dell INSPIRON N5110 computer (Intel® core™ i5-2450M, RAM 4.00G).

System Design:

The system consists of two tests, designed using the Vajol Basic language, with various interactive windows and interfaces provided. Through it, the programmer can design games and applications that subject the individual to response and reaction. The designed system consists of two tests to measure attention focus and motor response speed. The first test consists of a window in which the target image appears on the computer screen facing the student. It has 3 buttons of different colors and the word start. The test method is as follows:

The first test

Test name:

-Motor response test.

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The test's purpose:
-Is to measure motor response time.
Tools used:
-Electronic calculator (1).
Performance method:
-The test is similar to the tool for measuring response speed, from the start of the whistle to clicking on one of the colored buttons (red-green-blue), i.e. this period is a measure of the delay time to answer.
Test method:
1. When the start button is clicked, the whistle sounds after a set amount of time, and the player must be prepared to hear it.
2. After the whistle, the basketball player appears for a random period of 5 seconds. This period changes each session in one of the corners or the middle of the basketball court.
3. The trainee must click on the button on the side where the basketball player is for the answer to be correct.
4. After the end of the test (20) times, we can increase or decrease the number of times, and according to the coach's desire and the examined category, the final result of the player will appear.

Degree calculation method:
If the response time is less than (5) seconds, and the answer is correct, then the result is (1). This equation calculates the total score for the test:
The total score of the test = number of answers/response time * 100.
The second test:
The second part of the test is designed to measure attention and focus, and it consists of a window that contains a picture of the goal and 3 basketball players. The test is as follows:
Test name:
-Attention concentration test.
Test purpose:
-Measurement of attention and focus.
Used equipment:
- Electronic computer (1).
Performance method:
- The test measures attention concentration from the whistle sound to clicking on one of the colored buttons (blue - green - red). This period is considered a measure of the delay time to answer.
Test method:
For the test, there are three basketball players in the scoring area. The first is red, the second is blue, and the third is green. When the test begins, the team color for the person taking the test is chosen at random. If the word (red) appears, it means that the red player is on your team, while the green and blue players are on the opposing team. The test requires that the examinee pay attention to his opponent from any angle and aim at him rather than the opponent, as described below:
1. When the start button is clicked, a beep sounds after a few random seconds, and the player must be prepared to hear it.
2. The players' places change randomly after the whistle, with a random period of less than 5 seconds. They change each time during the experiment, and the players are distributed in the barkans close to the goal area, i.e. the basket.
3. The trainee must click on the button located on the side where the team player is located. This is determined at the beginning of the test, for his answer to be correct.
4. Concentration in attention is measured through the correct answer, where it gets a score of 1 for the correct answer. However, it takes zero if the answer is wrong or exceeds the prescribed time period.
5. The player's final result appears after the end of the test 20 times, according to the wishes of the examined group and the coach.
Degree calculation method:
In case of a correct answer, the result is given a value of (1) if the response time is less than (5) seconds, otherwise it is considered zero.
Presentation and discussion of results:

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The researchers used a computerized program and tests to achieve the desired research results. The two tests, attention focus and motor response time have standard scores. As well as by obtaining raw data (it is necessary to convert grades from raw grades to standard grades). This is a method of determining the relative position of the individual scores. As a result, these scores can be interpreted and their outcomes evaluated; as a result, Table No. (1) Was presented by the researcher.

Table (1) Shows the arithmetic mean, standard deviation, standard error, the highest value, and lowest value of the motor response time and attention focus tests applied to the research sample

No.	Statistics auditions	Unit of measurement	Arithmetic mean	Standard deviation	Standard error	Highest grade	Lowest degree
1	Motor response time	**Degree/Second**	**56.69**	**9.12**	**1.30**	**91.13**	**24.33**
2	Focus attention	degree	**13.69**	**1.33**	**0.19**	**18**	**9**

Table (2) It shows the raw scores and the standard scores using the sequential method to test the motor response time (fixed amount) = (0.91).

Grades							
Normative	Raw	Normative	Raw	Normative	Raw	Normative	Raw
1	12.1	**26**	34.85	**51**	57.6	**76**	80.35
2	13.01	**27**	35.76	**52**	58.51	**77**	81.26
3	13.92	**28**	36.67	**53**	59.42	**78**	82.17
4	14.83	**29**	37.58	**54**	60.33	**79**	83.08
5	15.74	**30**	38.49	**55**	61.24	**80**	83.99
6	16.65	**31**	39.4	**56**	62.15	**81**	84.9
7	17.56	**32**	40.31	**57**	63.06	**82**	85.81
8	18.47	**33**	41.22	**58**	63.97	**83**	86.72
9	19.38	**34**	42.13	**59**	64.88	**84**	87.63
10	20.29	**35**	43.04	**60**	65.79	**85**	88.54
11	21.2	**36**	43.95	**61**	66.7	**86**	89.45
12	22.11	**37**	44.86	**62**	67.61	**87**	90.36
13	23.02	**38**	45.77	**63**	68.52	**88**	91.27
14	23.93	**39**	46.68	**64**	69.43	**89**	92.18
15	24.84	**40**	47.59	**65**	70.34	**90**	93.09

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16	25.75	**41**	48.5	**66**	71.25	**91**	94
17	26.66	**42**	49.41	**67**	72.16	**92**	94.91
18	27.57	**43**	50.32	**68**	73.07	**93**	95.82
19	28.48	**44**	51.23	**69**	73.98	**94**	96.73
20	29.39	**45**	52.14	**70**	74.89	**95**	97.64
21	30.3	**46**	53.05	**71**	75.8	**96**	98.55
22	31.21	**47**	53.96	**72**	76.71	**97**	99.46
23	32.12	**48**	54.87	**73**	77.62	**98**	100.37
24	33.03	**49**	55.78	**74**	78.53	**99**	101.28
25	33.94	**50**	**56.69**	**75**	79.44	**100**	102.19

- Raw scores and standard scores in a sequential manner to test attention focus:

Table (3) The raw and standardized scores for the concentration of attention test using the sequential method (fixed value = 0.13)

Grades							
Normative	Raw	Normative	Raw	Normative	Raw	Normative	Raw
1	7.32	**26**	10.57	**51**	13.82	**76**	17.07
2	7.45	**27**	10.7	**52**	13.95	**77**	17.2
3	7.58	**28**	10.83	**53**	14.08	**78**	17.33
4	7.71	**29**	10.96	**54**	14.21	**79**	17.46
5	7.84	**30**	11.09	**55**	14.34	**80**	17.59
6	7.97	**31**	11.22	**56**	14.47	**81**	17.72
7	8.1	**32**	11.35	**57**	14.6	**82**	17.85
8	8.23	**33**	11.48	**58**	14.73	**83**	17.98
9	8.36	**34**	11.61	**59**	14.86	**84**	18.11
10	8.49	**35**	11.74	**60**	14.99	**85**	18.24
11	8.62	**36**	11.87	**61**	15.12	**86**	18.37
12	8.75	**37**	12	**62**	15.25	**87**	18.5
13	8.88	**38**	12.13	**63**	15.38	**88**	18.63

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14	9.01	**39**	12.26	**64**	15.51	**89**	18.76
15	9.14	**40**	12.39	**65**	15.64	**90**	18.89
16	9.27	**41**	12.52	**66**	15.77	**91**	19.02
17	9.4	**42**	12.65	**67**	15.9	**92**	19.15
18	9.53	**43**	12.78	**68**	16.03	**93**	19.28
19	9.66	**44**	12.91	**69**	16.16	**94**	19.41
20	9.79	**45**	13.04	**70**	16.29	**95**	19.54
21	9.92	**46**	13.17	**71**	16.42	**96**	19.67
22	10.05	**47**	13.3	**72**	16.55	**97**	19.8
23	10.18	**48**	13.43	**73**	16.68	**98**	19.93
24	10.31	**49**	13.56	**74**	16.81	**99**	20.06
25	10.44	**50**	**13.69**	**75**	16.94	**100**	20.19

Table (4) The normal distribution curve depicts the prescribed percentages and their standard levels. It also displays the raw scores, modified standard scores, number of players, and percentages for each level of the concentration test.

Normative levels and their prescribed ratios in the normal distribution curve	**Raw grades**	**Sequentially modified standard scores**	**Number of players**	**Percentages**
Weak (4.86)	and below – 29.39	1 – 20	__	__
Acceptable (24.52)	47.59-30.3	21 – 40	9	%18.36
Average (40.96)	65.79-48.5	41 – 60	32	%65.30
Good (24.52)	83.99-66.7	61 – 80	8	%16.32
Very good (4.86)	84.9 – and above	81 – 100	__	__

Researchers attribute the reason for the discrepancy and difference in sample results here. Mental processes are important and the effective and significant role they play for different age groups in general. This is especially true for the stage of students who play basketball in particular. This researcher believes that the most significant processes are mental processes. These processes affect focus and attention, which are mental processes that direct senses to a specific stimulus or incident. Attention is focused on sorting the stimuli, concentrating on one specific stimulus, and directing the senses to it. As a result, a particular situation is dealt with, or a particular situation is dealt with without others' involvement. The researcher also believes that the process of applying attention, whether voluntary or involuntary, such as applying voluntary attention to a specific stimulus, such as applying attention to extracting differences between two images, or unintentionally when hearing a strong

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sound. According to the researcher, focusing attention can become subconscious if it is practiced repeatedly and intensively over time.

The researcher agrees with what was indicated by (Mahmoud Abdel Halim Mansi and Afaf Mohamed Abdel Moneim). Adnan Youssef Al-Atoum confirms that paying attention to a stimulus moves through several stages, starting with detecting it with one or more senses, such as hearing or sight. Then, it is recognizing the nature of the stimulus based on previous experience, guesswork, and memory. As he becomes familiar with it, he responds to a stimulus or a group of stimuli. This includes selecting a specific stimulus and preparing for the corresponding treatment. Attention focus tasks that increase the cognitive burden by the size of the stimuli included in the test led to the disparity and difference in the answer to the extracted results that emerged from the study under study. The researcher also agreed with Treisman & Gelade, "Attentional processing is sensitive to volume.

According to Cadet's attentional resource theory, "resources greatly affect the occurrence of selection." When the goal is to select one stimulus (target stimulus), its attentional requirements must be greater than the requirements of the other stimuli (distracting stimuli), and thus the selection process will be successful.

Table (5) Displays the standard levels and percentages determined for them in the normal distribution curve, as well as the raw scores, modified standard scores, number of players, and percentages for each level in the motor response time test

Normative levels and their prescribed ratios in the normal distribution curve	Raw grades	Sequentially modified standard scores	Number of players	Percentages
Weak (4.86)	Below – 9.79	1 – 20	__	__
Acceptable (24.52)	12.39-9.92	21 – 40	9	%18.36
Average (40.96)	14.99-12.52	41 – 60	32	%65.30
Good (24.52)	17.59-15.12	61 – 80	8	%16.32
Very good (4.86)	-17.72 and above	81 – 100	__	__

The difference and variation in the times or times of the motor response are attributed by the researcher to differences in the nature of the players and their ability to pay attention and focus, as well as their ability to identify information in the processes of attention, perception, and focus. This is because of the method used in the process of the computer program's work. This process will be measured by evaluating operations and the extent to which they conform to the appearance of visual effects. As a result, the cognitive burden provided by this test increased quantitatively. As a result, the process of focusing attention becomes more difficult. The greater the cognitive load variables, the greater the amount of information transferred to the information processing system. As a consequence, we notice an increase in concentration, distraction, and susceptibility to stimuli, resulting in a variety of responses.

The researcher agrees with (keele) quoting (Mahmoud Abdel-Fattah Adnan) that any sporting event can be measured or calculated based on the amount of transmitted information that causes the players' response. The more information transmitted by the event, the more difficult it is for motor perception to occur, so the player's reaction time will be faster in response to a single light source than in response to several emitted light sources. As more data is transferred.

The researcher believes that motor response time affects technique during the game. In addition, motor response time depends on how players move on the field. Furthermore, the scoring process in basketball depends largely on response time. Whenever the player enjoys a short response time, this leads to a speed in cutting and scoring the ball, and this certainly varies from one player to another due to several factors, including training age, experience, and the cognitive factor associated with many variables such as stability and the ability to perform well, and these factors are all dependent on the

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extent of the ability to perceive temporal. This in turn is linked to the ability to perceive the things that surround him from the factors of the game. This is thus the ability to anticipate the amount of time required. As well the closer these factors are completed to the ideal, the more temporal perception will prefer, and this certainly varies from one player to another.

The researcher agrees with Vandal's statement. Davendoff (1980) argued that the complex process of perception depends on both the brain and the sensory system. As for the sensory system, it shows and discovers information, converts it into nerve signals, prepares some of them, and sends most of them to the brain through nerve tissues. The brain also plays a major role in providing or processing physical information. Therefore, perception depends on four operations: information processing and discovery, conversion, and transmission. The researcher also believes that there were differences among study members. The reason is due to the change in perception and interpretation of information. In addition, the difference between the players is in speed in interpreting signals. It describes the sensory stimuli that occur in the human body and are formulated in a way that can be recognized and comprehended.

The researcher agrees with Radi Al-Waqfi (1988) (Perception is a process of translating sensors that are transmitted to the brain in the form of encoded messages, what they are are electrical impulses that flow through the sensory nerves that connect the sensory organs and the brain). Perception is a constructive process in the sense that the electrical signals that reach the brain combine to form a comprehensive, meaningful perception.

Conclusions:

1- Access to the design of a computer system to measure basketball players' concentration of attention and motor response time.
2- Finding the standards represented by grades and levels for computerized tests.
3- The computer tests accurately indicated the players' mental processes.

Recommendations:

1. The researcher recommends expanding scientific tests to measure mental processes.
2. The researcher recommends mental tests be conducted on other samples different from the research sample.
3. Paying attention to studying different and evolving scientific variables that affect motor response speed and focus of attention among players, especially psychological variables.

Reference

1- Halim Mansi and others: Psychology and mental abilities, University Knowledge House, Alexandria, 2007.
2- Radi Al-Waqfi: An Introduction to Psychology, 3rd edition, Amman, Dar Al-Shorouk, 1988.
3- Vandal. Dafendouf: Introduction to Psychology, translated by Sayed Al-Tawab and others, Al-Tahrir Library Publications, Cairo, 1980.
4- Muhammad Hassan Allawi, Muhammad Nasr al-Din Radwan: Measurement in Physical Education and Sports Psychology, Cairo, Rose Al-Youssef Foundation, 1988.
5- Mahmoud Abdel-Fattah Adnan: The Psychology of Physical Education and Sports between Theory, Practice and Experimentation, Cairo, Dar Al-Fikr Al-Arabi, 1995.
6- Youssef Al-Atoum, Adnan, Cognitive Psychology, 1st Edition, Dar Al-Masira, Amman 2004.
7- Anne Treisman and Garry Gelade (1980). "A feature-integration theory of attention." Cognitive Psychology, Vol. 12, No. 1.
8- Bernard Cadet, Psychology Cognitive, Press edition, Paris,1998,

https://10.33687/jhssr.002.02.000220

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