

# Designing and standardizing the testing battery for bioactive capabilities as an indicator for the selection of the volunteers of the Commissioners Preparation Institute

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## **Abstract**

*The research problem lies in the lack of special biomechanical tests in the field of physical training to update the test batteries in a way that simulates the requirements and their field developments, and the research aims to design and standardize the test battery for biomechanical abilities as an indicator for the selection of the volunteers of the Institute for Preparing Commissioners. The researchers adopted the descriptive approach. Institute for the preparation of commissioners, the number of (400) students, biomechanical tests that are compatible with the research requirements were identified and nominated (15) A test, exploratory experiments were conducted, and appropriate statistical treatments were conducted, including a matrix of correlation coefficients for all variables and a factor analysis using the basic components method using the slanted rotation. On the rationing sample, the researcher extracted the standard scores, and the study reached some conclusions, the most important of which are: The factor analysis of the inter-correlation matrix of the variables for the biomechanical tests enabled the researcher to reach (5) factors, to arrive at setting standards scores for biomechanical tests as a means of evaluation, evaluation and interpretation that can be relied upon to select The volunteers of the Institute for the Preparation of Commissioners and in light of the conclusions the researcher recommended: The use of the battery concerned with measuring biomechanical tests extracted internationally as objective methods for measuring and evaluating the capabilities of the volunteers of the institute of preparing commissioners, from the results of the current study, especially the criteria in light of the classification of the capabilities of the volunteers of the institute of preparing commissioners.*

**Keywords:** design, legalization, battery - bioactive capabilities, indicator for the selection, Commissioners

## **Introduction**

The development in the mathematical sciences witnessed a qualitative progress that reflected directly and tangibly in the development of bio-kinetic capabilities (strength, speed, elongation, endurance, agility, flexibility) and their importance in achieving the desired goals. (Full, 2008) And that this development coincided with the development of the armed forces and internal security in all countries of the world, which gave those interested in physical training within the military institutions by developing scientific programs to keep pace with all aspects of the military work requirements and to raise the biomechanical capabilities of the combatant in line with the physical work that the combatant does during wars and in Periods of training and preparation and that the Iraqi armed forces and internal security were among their programs and priorities the development of training programs aimed at raising the physical fitness of the fighter and opening specialized institutions in this field through basic, development and inevitable courses that serve one goal, which is to stand on the readiness of the combatant and prepare to endure the burden of military work. Specialists have four tests, and in some institutions five, they are called the test battery, through which they can examine and test the elements of the combatant's physical fitness and indicate his military physical capabilities, where each test is a measure of one of the elements of the physical fitness. (Elaph, 2004) Hence the importance of research is in maintaining the level of biomechanical abilities of the internal security forces and continuing to complete the daily work. The applicant to volunteer in all the Ministry of Interior's agencies must have distinctive physical characteristics and qualities that qualify them to carry out duties and

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tasks, which requires the development of standards and specialized tests to measure the biological capabilities and determine degrees Acceptance, rejection, and the volunteer who passes the exams and becomes eligible for admission and vice versa. (Thaer, 2015)

**Research problem :**Through my current work in the Ministry of the Interior and currently as director of the Training and Courses Department in the Directorate of Physical Training and Games, where there is a battery for testing physical fitness components for employees of the Ministry of Interior and this battery does not have an administrative or legal reference, and (15) years have passed since its work. The battery itself is the one that volunteers are newly selected in the Ministry of Interior for each of the (Institute for Commissioners Preparation) and this is a problem that must be addressed. A special battery must be prepared with specifications and technology to select the elements and volunteers recently for the owners of the Ministry of Interior, and that this battery has specifications and options that meet the requirements and ambitions of the Ministry of Interior with all its terms of reference and the first step of the administrative and legal organization of physical training work and raise the level of fitness in the Ministry of the Interior followed several steps in the future ,so felt the researcher to build a battery does not test data bio-movement for selecting the Volunteer Institute of counter Commissioners at the Ministry of the Interior.

#### Research objectives

- Identify the values of the biological capabilities of the volunteers of the Commissioners Preparation Institute at the Ministry of the Interior.
- Building bio-movement tests for the selection of volunteers prepare the Institute of Commissioners at the Ministry of the interior.
- Legalization of tests Bioenergetics mobility as an indicator for Selection Volunteers Institute of Counter Commissioners at the Ministry of the Interior.

#### Research areas:

- The human sphere: the volunteer institute for the preparation of commissioners in the Ministry of the Interior.
- Temporal domain:
- Spatial domain : Police College at the Ministry of Interior

#### Research methodology and field procedures

**Research methodology:** The researcher adopted the descriptive method using the survey method.

**Research community and sample :**Determining the research community of the police commissioners at the Commissioners Preparation Institute, whose number is (400) commissioners, where (110) failed to perform most of the tests and were absent, and the actual number of the sample members reached (290) laboratory. The research sample is as shown in Table (4).

**Table (1) Sample distribution**

T	Sample distribution	the number	the number
1	Excluded (not showing up, failing most of the exams)		110
2	The sample of the first exploratory experiment	10	
3	The sample of the second exploratory experiment (the scientific basis for tests and scale)	30	
4	The main experiment sample construction	150	
5	Major experiment sample rationing	100	
<b>Total members of the sample</b>		290	
<b>Total sum</b>		400	
<b>Its percentage is the representation of the research sample from the community</b>		72.5%	

#### 3-3-1 means of gathering information:

- ❖ Arab and foreign references and sources.
- ❖ Tests and benchmarks.
- ❖ International Information Network (Internet).
- ❖ Questionnaire to survey the opinions of experts and specialists.  
A form for registering and discharging the results of the search tests .

#### 3-3-2 used devices:

- ❖ Digital camera type (Casio (1) Japanese-made.
- ❖ Personal computer (laptop) type DELL) Chinese made.
- ❖ Hours timing of electronic number (7).

#### 3-3-3 Tools used:

- ❖ A (50) m leather tape measure, count (2).
- ❖ Metal tape measure (8) m, count (3).
- ❖ Colorful adhesive tapes.
- ❖ Plastic signs, count (25).
- ❖ Small size balls (10).
- ❖ Number (4) whistle.

**3-4 field research procedures:**

**3.4.1 identification of the most important variables bio-movements:** The identification capabilities bio-movements the most common , which t fit with the study, ( explosive power (of the arms and legs) , distinctive force of the speed (of the arms and legs), the transition speed , carrying speed, bearing year , Agility , compatibility ) .

**3. 4.2 nomination of bio-movements tests:** resorted researcher that the numbers form a questionnaire , for the nomination of a number of tests and presented to a group of experts and eunuch's (5 1), For the purpose of expressing their opinions by choosing the tests that fit the requirements of the study, adopting a percentage (70%) and neglecting the percentages that get less than this value , " the researcher has the right to choose the percentage he deems appropriate (Ella, 2004)", and as shown in Table No. (2).

Name of the test	Repetition	Agreement percentage	Candidate test
<b>Explosive force</b>			
Vertical jump from stability	15	100%	√
The broad jump from stability	15	100%	√
Vertical jump from movement	2	13.33%	X
From standing, throwing a medicine ball (3 kg) with the hands to the imam over the head	14	93.33%	√
From standing, throw a medicine ball (3 kg) with your hands back over the head	3	20%	X
From standing throwing a medicine ball (3kg) with one arm forward (adjusted)	6	40%	X
From sitting on a chair throwing a medicine ball (3 kg) with the hands back over the head (modified)	5	33.33%	X
<b>Fast power</b>			
Partridge (10) partridges for each man	10	66.66%	X
Shenaw belly for 1 / Accurate	11	73.33%	√
The vertical jump from standing with the knees bent in half in 10 seconds	2	13.33%	X
Partition with the feet with the feet together during (60) seconds	12	85.71%	√
The sloping chin is from placing the feet on a height box (20 cm)	7	46.66%	X
Moving Shenaw up to 20 sec.	3	20%	X
Pull on the bar 60/ sec.	13	86.66%	√
<b>Transitional velocity</b>			
Run 40 m from high start	9	60%	X
Run 45 m from high start	13	86.66%	√
Run 50 m from high start	12	85.71%	√
Run 200 m from high position	11	73.33%	√
<b>General endurance</b>			
Run - 800m	13	86.66%	√
He ran 270 m	11	73.33%	√
Harvard test	5	33.33%	X
Run for 12 minutes (Cooper's test)	2	13.33%	X
Ran 540 m	15	100%	√
<b>Agility</b>			
Shuttle ran in different dimensions 9 + 3 + 6 + 3 + 9	14	93.33%	√
My shuttle ran 10m x 4 times	11	73.33%	√
He ran between the haves a distance of (15) m	13	86.66%	√
Direction Change Run (6 x 5m)	3	20%	X

He ran between the haves a distance of (30) m	5	33.33%	X
<b>Compatibility</b>			
Jump inside the numbered circles	11	73.33%	√
Throw and receive test	13	86.66%	√
Pass a tennis ball against a wall for 25 seconds	7	46.66%	X
Skipping rope	3	20%	X
Running on the crossbar	12	85.71%	√

### 3-4-5 Exploratory Experience :

3-4-5-1 *The first exploratory experiment*: The first exploratory experiment was carried out on Sunday and Monday on the date (6-7 / 01/2020 ) on a sample consisting of (10) testers aimed at all checking the accuracy of the equipment and tools used , the time taken to perform Tests , ascertaining the sample level and the feasibility of the current research.

3-4-5-2 *second reconnaissance experiment* (Wallace Q scientific tests Albaouhrkih ): The implementation on Sunday - Tuesday a brief summary (12- 14/01/2020) on a sample amounted to (30) laboratories t .

3-4-5-3 *the scientific basis for biomechanical tests*

*First: Honesty (validity)*: The two researchers approve the validity of the content according to the expert opinion regarding the extent to which the test represents aspects of ability, trait, or measured knowledge "(Layla, 2001), and concomitant honesty (distinctive strength) by adopting a ratio (27%) by dividing the grades of the upper and lower groups for the ability tests A distinction when the distribution of scores in the test is in the form of the equilibrium distribution curve "(Marwan, 2001), using the (T) test for independent samples to statistically treat the data , as shown in Table ( 3 ).

**Table ( 3 ) the discriminative ability for bio-movements tests**

T	Name of the test	Supreme group		inferior group		Values	
		s	± p	s	±p	T	sig
1	<b>The vertical jump</b>	16.900	1.912	38.900	3.213	-1 8.608	0.000
2	<b>Throwing a medicine ball</b>	276.000	26.800	447.800	25.564	-14.669	0.000
3	<b>The broad jump from stability</b>	133.100	12.732	188.600	13.066	-9.620	0.000
4	<b>Shenaw belly for 1/ Accurate</b>	6.700	0.483	11.200	0.789	-15.385	0.000
5	<b>Partridge feet 1 minute</b>	37.800	5.116	63.200	5.613	- 10.575	0.000
6	<b>Pull the bar 1 d</b>	6.500	0.850	10.400	1.838	-6.091	0.000
7	<b>It ran 200 m</b>	26.700	1.418	32.800	1.229	-10.278	0.000
8	<b>He ran 270 m</b>	35.700	2.263	45.200	2.300	-9.311	0.000
9	<b>Ran 540 m</b>	1.457	0.076	2.147	0.092	-18.252	0.000
10	<b>Throw a ball and receive it</b>	10.800	0.6 32	14.500	0.850	-11.045	0.000
11	<b>Jump on the numbered circles</b>	13.300	0.483	17.100	0.738	-13.626	0.000
12	<b>Running on poles</b>	8.900	0.738	12.600	0.516	-12.992	0.000
13	<b>He ran between the streets (30 m)</b>	14.900	0.994	17,800	0.919	-6.773	0.000
14	<b>Shuttle ran 10m x 4</b>	9.600	0.51 6	13,000	0.943	-10.002	0.000
15	<b>My shuttle ran of various dimensions</b>	4,600	0.516	8.700	0.483	-18.336	0.000

*Second: Stability (Reliability) , Objectivity ( objectivity) :* It has been founded that the stability in a way of testing and re - testing, and objectivity if it gives the same degree regardless of who correctable ( Mohammed, 1995 ) , On (14-16 / 3\_ 22- 24 / 3) 2020 , using the simple correlation coefficient, as shown in Table ( 4 ).

**Table (4) Validity and stability if the tests**

T	the test	measuring unit	Stability coefficient	sig	Link Lab	Significance values
1	<b>The vertical jump</b>	cm	0.864	0.000	0.891	0.000
2	<b>Throwing a medicine ball</b>	meter	0.849	0.000	0.84 4	0.000
3	<b>The broad jump from stability</b>	meter	0.853	0.000	0.849	0.000
4	<b>Shenaw belly for 1/ Accurate</b>	Repetition	0.883	0.000	0.877	0.000
5	<b>Partridge feet 1 minute</b>	distance	0.812	0.000	0.948	0.000
6	<b>Pull the bar 1 d</b>	Repetition	0.865	0.000	0.968	0.000
7	<b>It ran 200 m</b>	a second	0.875	0.000	0.909	0 .000

8	He ran 270 m	a second	0.915	0.000	0.874	0.000
9	Ran 540 m	a second	0.902	0.000	0.928	0.000
10	Throw a ball and shoot it	Repetition	0.871	0.000	0.909	0.000
11	Jump on the numbered circles	a second	0.807	0.000	0.870	0.000
12	Running on poles	a second	0.888	0.000	0.900	0.000
13	He ran between the halves a distance of (30) m	a second	0.871	0.000	0.923	0.000
14	My shuttle ran 10m x 4 times	a second	0.807	0.000	0.835	0.000
15	Shuttle ran in different dimensions 9 + 3 + 6 + 3 + 9	a second	0.915	0.000	0.986	0.000

**3-4-6 main (basic) experience:**

3-4-6-1 *sample construction experience*: was conducted on a sample experiment was strong (150) Laboratory, has been divided for three days in order to obtain the values of the tests sample capabilities Albaouhrkih search as follows:

*The first day (Tuesday 02/04/2020): The following tests were conducted:*

- Ran 200 m, jump column J , throwing a medical ball, ran various dimensions Shuttle + 9 + 3 + 6 + 3 9, jump broadband stability.

*The second day (Wednesday 02/05/2020): The following tests were conducted:*

- Partridge with feet 1 / minute, pulling the bar 1 / minute, jogging 270m, running from under the poles, shuttling 10m x 4 times.

*The third day (Thursday 02/06/2020): The following tests were conducted:*

- He ran a distance of 540 m , jumped on the numbered circles, ran between the halves a distance of (30) m, was on a stomach for 1 / minute , threw a ball and received it.

3-4-6-1 *Rationing sample experiment*: The experiment was carried out on a sample of 100 labs, as follows:

- Day one (Thursday 02/27/2020): Body measurements were taken
- The second day (Sunday 3/1/2020): The following tests were taken: Running test on beam , vertical jump test, 1d bar pull test, running test (540m), Schnau test 60 seconds)

3-4-7 *the statistical methods used in the research*: The researchers use the statistical bag ( spss) Descriptive statistics , inferential statistics .

**4- Presenting, analyzing and discussing the research results**

**4.1 descriptive statistics tests capabilities Albaouhrkih: Table ( 5 ) shows that**

variables		measuring unit	Arithmetic mean	Mediator	Standard deviation	Coefficient of torsion
				Variables	Test code	
The vertical jump	VAR01	cm	26.191	24,000	8.582	0.603
Throwing a medicine ball	VAR02	cm	359.987	361.500	60.985	0.132-
A jump from stability	VAR03	cm	166.730	161,000	18.485	0.672
Shenau belly for 1 / minute	VAR04	Repetition	27.303	26,000	5.405	0.586
Partridge feet 1 minute	VAR05	distance	48.776	47.500	10.426	0.191
Tensile to block 1 d	VAR06	Repetition	9.224	9.000	1.604	0.087
It ran 200 m	VAR07	a second	30.125	31,000	2.525	0.125
He ran 270 m	VAR08	a second	47.138	47,000	2.762	0.107
Ran 540 m	VAR09	a second	1.709	1.560	0.254	0.212
Jump on the numbered circles	VAR10	a second	12.809	13,000	1.365	0.693

<b>No running on the crossbar</b>	VAR11	a second	14.834	15,000	2.185	0.069
<b>He ran between the halves a distance of 30 m</b>	VAR12	a second	10.586	10,000	1.829	0.289
<b>Shuttle ran 10m x 4m</b>	VAR13	a second	16.770	17,000	1.759	0.013
<b>My shuttle ran in different dimensions</b>	VAR14	a second	10.783	11,000	1.582	0.730

**4 - 1 1. Intra - matrix correlations tests bio-movements capacity:** included matrix (15) test, ( 105(A correlation coefficient, the number of positive correlations reached (56) coefficients, and a percentage of (53.33%), while the number of negative correlations reached (49) a correlation coefficient with a percentage (46.66%). 45.71% of which (23) is a positive correlation coefficient, which constitutes (21.90%) of the total correlations and a percentage (47.91%) of the total indicative correlations, while the number of negative correlations reached (25) coefficient, which constitutes (23.810%) of the total of the total correlations with a percentage (52.083%) of the total functional correlations , and as shown in Table No. (6).

Variab les	VA R1	VA R2	VA R3	VA R4	VA R5	VA R6	VA R7	VA R8	VA R9	VAR 10	VAR 11	VAR 12	VAR 13	VAR 14
VAR2	0.72 4	1												
VAR3	0.11	0.22 2	1											
VAR4	0.16 8	0.08 6	0.06 9	1										
VAR5	0.01 4	- 0.09 7	- 0.03 3	0.04 7	1									
VAR6	0.14 7	0.08 9	- 0.17 8	- 0.00 4	0.04	1								
VAR7	- 0.27 1	- 0.26 5	- 0.17 7	- 0.11	0.07 1	0.22 2	1							
VAR8	- 0.01 5	- 0.10 5	- 0.14 2	- 0.18 3	0.20 5	0.01 7	0.22 5	1						
VAR9	0.07 6	0.09 5	0.14	0.02 7	0.1	0.12 2	- 0.36 4	0.03 3	1					
VAR1 0	- 0.52 6	- 0.45 4	- 0.27 6	- 0.13 7	0.02 4	0.01 1	0.29 7	- 0.04 2	0.02	1				
VAR1 1	-0.1	- 0.02 2	0.17 4	0.09 6	0.02 7	- 0.15 8	- 0.06 3	0.12 3	- 0.15	- 0.261	1			
VAR1 2	- 0.46 8	- 0.45 3	- 0.13 5	- 0.08 8	0.17 5	- 0.13 3	0.13 2	0.20 4	- 0.05 6	0.17	0.447	1		
VAR1 3	0.08 7	0.06 4	- 0.02 6	0.14 8	- 0.10 2	0.11 2	- 0.00 5	- 0.22	0.05 8	0.257	- 0.327	- 0.355	1	
VAR1 4	0.03 3	0.04 4	- 0.01 7	0.07 7	0.14 8	- 0.09 6	- 0.00 8	0.14 8	- 0.05 8	- 0.203	0.34	0.383	- 0.416	1
VAR1	0.06	0.06	-	-	-	0.21	0.04	-	0.11	0.287	-	-	0.273	-

5	8	4	0.11 6	0.08 8	0.06 3	7		0.11 4			0.532	0.384		0.335
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**4 - 1 , -2 adequacy of the sample size for conducting global analysis:** The value of ( KMO) (0667) , which is greater than the level of significance (0.05) , indicating a significant sample size , the value of Bartlett test ( Barlett) (549.164) at the level of significance (0.000), which is of course less than the adopted level of significance (0.05), which indicates that this matrix represents one matrix , so that we can be sure that these relationships are a statistical function.

**4 - 1-3 Factor extraction:** The second researcher adopted the basic components method for factor extraction , and adopted the Kaiser method to generate and extract factors whose latent roots exceed the correct one , as shown in Table (7).

FACTORS				The underlying roots	Rate variance	Cumulative ratio of variance	The underlying roots	Rate variance	Cumulative ratio of variance
		FACTOR EXTRACTI ON	BEFORE RECYCLI NG	AFTER ROTATI NG	2.97	19.798	19.798	2.768	18.456
variance	Cumulative ratio of variance	The underlying roots	Rate	2.637	17,578	37.376	2.564	17.096	35,551
variance	Cumulative ratio of variance			1.479	9.858	47.234	1.55	10.334	45.886
	The underlying roots	Cumulativ e percentage	percentag e	1.272	8.48	55.714	1.321	8.806	54.692
variance	Cumulative ratio of variance	The underlying roots	Rate	1.111	7.408	63.123	1.265	8.431	63.123
variance	Cumulative ratio of variance								
VAR01	2.97	19.798	19.798						
VAR02	2.637	17,578	37.3 76						
VAR03	1.479	9.858	47.234						
VAR04	1.272	8.48	55.714						
VAR05	1.111	7.408	63.123						
VAR06	0.906	6.042	69.164						
VAR07	0.859	5.729	74.894						
VAR08	0.764	5.093	79.987						
VAR09	0.651	4.342	84.329						

**4 - 1 -4 estimate the initial solution of the matrix (before recycling):** showed the global matrix before recycling (5) factors that control bio-movements applicants for the Institute to prepare commissioners, police, and arranged in descending order according to their importance as the first factor greater interpreted as much of the variation then followed by factor The second, then the third, the fourth, then the fifth, and Table (8) shows that

Name of the test	Factors before recycling					Rate subscriptions	
	1	2	3	4	5	Explained variance	Special contrast
<b>A test that ran between the flags, a distance of (15) m</b>	- 0.83					0.726	0.274
<b>The vertical jump test</b>	0.632	0.527	0.361			0.816	0.184
<b>Throwing medical ball test</b>	0.619	0.54				0.744	0.256

<b>The test ran 10 m x 4 shuttles times</b>	0.51	-0.404			0.307	0.569	0.431
<b>Jumping test on the numbered circles</b>	-0.198	-0.79				0.713	0.287
<b>A test run on the crossbar</b>	-0.533	0.542				0.625	0.375
<b>Throw and receive test</b>	0.511	-0.527				0.586	0.414
<b>Shuttle run test of various dimensions 9 + 3 + 6 + 3 + 9</b>	-0.459	0.481				0.508	0.492
<b>Wide jump stability test</b>		0.417	-0.386			0.39	0.61
<b>The test ran 270m</b>	-0.354		0.58			0.541	0.459
<b>Tensile test for 1 d block</b>			0.557			0.476	0.524
<b>The test ran 540m</b>				0.85		0.786	0.214
<b>The test ran 200 meters</b>	-0.318	-0.444	0.396	-0.452		0.669	0.331
<b>Partridge test biped 1 minute</b>			0.375	0.451	0.363	0.525	0.475
<b>Test the Schnau belly for 1 / min</b>					0.816	0.793	0.207
<b>Latent root (in-kind values(</b>	2.97	2.637	1.479	1.272	1.111	9.469	
<b>Explained variance ratio (significance of factors(</b>	19.798	17,578	9.858	8.48	7.408		
<b>Mass contrast ratio (cumulative contrast ratio(%)</b>	19.798	37.376	47.234	55.714	63.123		
<b>Relative importance</b>	0.315	0.278	0.156	0.134	0.117		

**4 - 1-5 Factors Matrix After Rotation (Final Solution):** Using orthogonal rotation by the Varimax method (Varimax) For Kaizer, in order to raise the value of large saturations and reduce the value of small saturations, b dimensions of unnecessary axes , b in order to obtain significant factors that do not change from one analysis to another and to obtain the simple composition of the matrix , it is necessary to adopt the special criteria established by Thurston) Which: (Muhammad, 1987 )

- ❖ Each row in the analysis must contain at least zero saturation.
- ❖ Each column contains a number of zero saturations equal to the number of factors at least.
- ❖ For each pair of columns in the rotated array, there must be a number of variables with zero saturation in one column, with corresponding non-zero saturations in the other column.
- ❖ For studies involving four or more factors, there must be a number of variables with zero saturations for each pair of bars.
- ❖ For each pair of factors there are a number of variables with explicit saturations in both columns, and in the case of using orthogonal rotation, a conversion process of the factor matrix to the matrix is performed after the rotation of simple structure, and the interpretation of factor solutions in most studies has remained dependent on the rotating factor matrix ( Mahasin, 1993 )

#### 4-1-7 Conditions for accepting a worker:

In order for the researcher to accept the factors extracted, he must follow the instructions given by a group of scholars to accept the factors, explain them and determine their identity, taking into account a set of points.

1. The Kaisermayr criterion was used to analyze the extracted factors of the function on the basis that the function factor is the factor whose latent root equals at least one integer or higher.
2. A worker who has saturated him accepts at least three tests or functional measurements, according to the Glyford test. Guilford ( $\pm 0.3$ ) ( Thaer, 2015 ) .
3. The factor is interpreted on saturations equal to or greater than ( $\pm 0.3$ ) (Safwat, 1980)
4. The dependence of the factors matrix after rotation in interpreting the results and after arranging the saturations of its variables on the factors in descending order.

Name of the test	Factors after recirculation					Rate subscriptions	
	1	2	3	4	5	Explained variance	Special contrast
<b>A test run on the crossbar</b>	0.752					0.893	0.107
<b>Throw and receive test</b>	-0.731					0.812	0.188
<b>Shuttle run test of various dimensions 9 + 3 + 6 + 3 + 9</b>	0.691					0.858	0.142
<b>A test that ran between the flags, a distance of (15) m</b>	0.631	-0.556				0.776	0.224

The test ran 10 m x 4 shuttles times	-0.607				0.445	0.891	0.109
The vertical jump test		0.888				0.544	0.456
Throwing medical ball test		0.853				0.672	0.328
Jumping test on the numbered circles	-0.382	-0.733				0.578	0.422
Tensile test for 1 d block			0.618			0.545	0.455
The test ran 200 meters			0.556	-0.52		0.625	0.375
Jump stability test			-0.55			0.578	0.422
The test ran 540m				0.865		0.616	0.384
Partridge test biped 1 minute			0.471	0.472		0.591	0.409
Test the Schnau belly for 1 / min					0.861	0.585	0.415
The test ran 270m			0.421		-0.514	0.556	0.444
Latent root (in-kind values)	2.768	2.564	1.55	1.321	1.265	9.468	
Explained variance ratio (significance of factors)	18.456	17.096	10.334	8.806	8.431		
Linear aggregate variance (cumulative contrast ratio)	18.456	35,551	45.886	54.692	63.123		
The relative importance of the factor	0.292	0.271	0.164	0.14	0.133	1	

**4-1-8 Naming factors:**

**4 - 1 - 9 Interpretation of the bio-movements capabilities factors**

**4 - 1 - 9-1 Interpretation of the first factor (compatibility):** After arranging the tests with high saturations that increase or equal ( $\pm 0.3$ ) in descending order, we find that there are (6) tests that saturated on this factor and formed a percentage of (40%) From the total number of (15) tests that were subjected to analysis, as shown in Table No. ( 10 ).

**Table ( 10 ) Shows the descending order of the saturation of the variables (tests) on the first factor**

T	Name of the test	Saturation value
1	The test run on the crossbar	0.752
2	Throwing and receiving test	-0.731
3	Shuttle run test of various dimensions 9 + 3 + 6 + 3 + 9	0.691
4	A test that ran between the flags, a distance of (15) m	0.631
5	The test ran 10 m x 4 shuttles times	0.607

**4 - 1 - 9-2 Interpretation of the second factor (explosive power) :** After arranging the tests with high saturations that increase or equal ( $\pm 0.3$ ) in descending order, we find that there are (4) tests that saturated on this factor, and a percentage amounted to (26.667) % Of the total number of (15) tests that were subjected to analysis and based on saturated tests that contributed to the acceptance of the second factor, as shown in Table No. (11).

**Table (11) the descending order shows the saturation of the variables (tests) on the second factor**

T	Name of the test	Saturation value
1	The vertical jump test	0.888
2	Medical ball throw test	0.853
3	Jumping test on the numbered circles	0.733

**4 - 1 - 9-3 Interpretation of the third factor (the characteristic strength of the velocity of the arms) :** After arranging the tests with high saturations that increase or equal ( $\pm 0.3$ ) in descending order, we find that there are (5) tests that saturated on this factor and formed a percentage of its amount (33.333%) of the total number of (15) tests that were analyzed and based on saturated tests that contributed to the acceptance of the third factor, as shown in Table ( 12 ).

**Table (12) the descending order shows the saturation of the variables (tests) on the third factor**

T	Name of the test	Saturation value
1	Pulley test on bar 1 d	0.618
2	200m sprint test	0.556
3	Leap stability test	-0.550
4	Sprint 270-meter test	0.421

**4 - 1 - 9-4 Interpretation of the fourth factor (general tolerance) :** After arranging the tests with high saturations that increase or equal ( $\pm 0.3$ ) in descending order, we find that there are (3) tests that saturated on this factor and formed a

percentage of (20) % Of the total number of (15) tests that were analyzed, based on the saturated tests that contributed to the acceptance of the fourth factor, as shown in Table (13)

**Table (13) the descending order shows the saturation of the variables (tests) on the fourth factor**

T	Name of the test	Saturation value
1	Sprint 540 m	0.865
2	200m sprint test	-0.520
3	Partridge test feet / min	0.472

**4 - 1 - 9-5 Interpretation of the fifth factor ( carrying the characteristic force with the velocity of the arms) :** After arranging the tests with high saturations that increase or equal ( $\pm 0.3$ ) in descending order, we find that there are (3) tests that saturated on this factor and formed a percentage The amount (20%) of the total number of (15) tests that were analyzed and based on the saturated tests that contributed to the acceptance of the fifth factor, as shown in Table ( 14 ).

**Table No. (14) Shows the descending order of the saturation of the variables (tests) on the fifth factor**

T	Name of the test	Saturation value
1	The Schnau test 60s	0.861
2	Sprint 270-meter test	-0.514
3	Shuttle run test	0.445

**4 -1-10 draw bio-movements tests :** were extracted five factors represent , independent tests to assess the physical condition of the students applying to the Institute to prepare police commissioners , each of which represents a factor of factors from the acceptable minimum, and the table ( 15), Shows the highest saturations of the final extracted battery tests.

**Table (15) Abstract factors, their nomenclature, and the tests saturations they represent**

T	Name of the test	measuring unit	Saturation value
1	The vertical jump test	cm	0.888
2	540-meter sprint test	Accurate	0.865
3	Hnao test 60 w the vessels	Repetition	0.861
4	A test run on the crossbar	Tha	0.752
5	Pulley test on bar / min	Repetition	0.618

The interconnections must be between the units of the extract, and this indicates that each test measures a component independent of the components that the other test measures, and the table (16) Shows the interconnections between the units that represent the battery.

Name of the test	1	2	3	4	5
A test run on the crossbar		- 0 0.100	- 0 .158	0.150-	0960
The vertical jump test			. 1470	0760	1680
Pulley test on bar / min				1220	0.004-
Sprint Test (540m)					0270
The Schnau test 60 seconds					

**A 4 - 3 criteria:** that a to get raw scores of things affordable for the measure not to face the difficulty lies in the interpretation of grades and give it a sense connotation " (Mohammad 2001), was extracted central tendency and dispersion measures for each of the results of the relevant tests measuring tests Biomechanics, as indicated in the first table ( 17).

T	Name of the test	measuring unit	Arithmetic mean	Mediator	standard deviation	Coefficient of torsion
1	The vertical jump test	cm	31.14	31.00	6.662	0009
2	Sprint Test (540m)	Accurate	1.48	1.49	0054	0037
3	Schnau test 60 / sec	Repetition	30.54	30.00	4.183	-0003
4	Running test crossbar	Sec.	15.08	15.00	1.675	0033
5	Pulley test on bar / min	Repetition	8.43	8.00	2.400	0130

The standard scores are used to interpret the raw scores to describe to us the aspects that indicate the specific features or characteristics. They are a means of comparison and evaluation because they reflect the current level of individuals "(Kamal, 1994), the grades of the legalization sample were converted into standard degrees (Z), Whose mean is (zero), its deviation is ( $\pm 1$ ), and the modified degree is T ((T. Score Its mean is (50) and its standard deviation (10) (Kamal, 2008), and that the process of extracting and determining the standard levels is based on the fact that the student's performance result in any of the investigated variables is distributed closer to normal, and this has actually happened in the indicators of biomechanical tests and as shown in Tables No. (18).

**Table (18) shows the raw and standard grade of the ration sample for the biomechanical tests**

The vertical jump		Sprint (540m)		Shenaw 60 w		Run on the crossbar		Pulling the bar 1 d	
Raw grade	The standard score	Raw grade	The standard score	Raw grade	The standard score	Raw grade	The standard score	Raw grade	The standard score
14	24.27	1.62	27.36	20	24.81	19	25.6	3	27.38
16	27.27	1.61	29.19	21	27.2	18.7	28.59	4	31.55
19	31.78	1.6	31.02	22	29.59	18.2	29.78	5	35.71
20	33.28	1.59	32.86	23	31.98	18	31.57	6	39.88
21	34.78	1.58	34.69	24	34.37	17.8	34.56	7	44.04
22	36.28	1.56	36.52	25	36.76	17.5	35.75	8	48.21
23	37.78	1.55	38.35	26	39.15	17.3	37.54	9	52.37
24	39.28	1.54	40.18	27	41.54	17.1	38.14	10	56.54
25	40.78	1.53	42.01	28	43.93	17	39.33	11	60.71
26	42.28	1.52	43.85	29	46.32	16.4	40.53	12	64.87
27	43.79	1.51	45.68	30	48.71	16.2	41.12	13	69.04
28	45.29	1.5	47.51	31	51.1	16	42.32	14	73.2
29	46.79	1.49	49.34	32	53.49	15.7	43.51	15	77.37
30	48.29	1.48	51.17	33	55.88	15.5	44.7		
31	49.79	1.47	53	34	58.27	15.3	45.9		
32	51.29	1.46	54.84	35	60.66	15	47.09		
33	52.79	1.45	56.67	36	63.05	14.8	48.29		
34	54.29	1.44	58.5	37	65.44	14.6	49.48		
35	55.79	1.43	60.33	38	67.83	14.4	51.27		
36	57.29	1.42	62.16	39	70.22	14.2	52.47		
37	58.8	1.41	63.99	40	72.61	14	53.66		
38	60.3	1.4	67.66			13.8	55.45		
39	61.8	1.39	69.49			13.6	56.64		
40	63.3	1.38	71.32			13.5	57.84		
41	64.8	1.37	73.15			13.3	61.42		
42	66.3	1.36	74.98			13.1	62.02		
44	69.3					13	63.21		
45	70.8					12.7	64.41		
46	72.31					12.5	66.2		
47	73.81					12	67.39		
						11.7	68.58		
						11.5	71.57		
						11	73.36		

### Conclusions

1. Reaching out to build a model for biomechanical tests to select the volunteers of the Institute for the Preparation of Commissioners as a result of the factor analysis, which enabled the researcher to arrive at (5) factors in light of the conditions of worker acceptance, which are as follows:
2. The first factor: (a test runs on the crossbar).
3. The second factor: (vertical jump test).
4. The third factor: (the tensile test on the bar is accurate).
5. The fourth factor: (enemy test (540 meters)).

6. Group V: (Hnao test 60 w the vessels )
7. Achieving the setting of standards scores and setting standard levels for biomechanical tests as a reliable evaluation, evaluation and interpretation method for selecting the volunteers of a commissioned institute.

**Recommendations:**

1. The use of the battery concerned with the measurement of biomechanical tests extracted internationally as objective methods in measuring and evaluating the capabilities of the volunteers of the institute of commissioners.
2. Benefiting from the results of the current study, especially the criteria in light of the classification of the capabilities of the volunteers of the Institute of Commissioners.

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