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Constructing Serious Creativity Scale for Athletes

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Abstract

The study problem is the lack of an Iraqi sport scale tool in the field of sport to measure serious creativity. It aims build a scale model of serious creativity of the applicants to individual and team sports in Iraq. Descriptive method with survey was used to build the scale. The study participants were a random sample of 425 sport people using De Bono's model to identify the concept, dimensions and phrases of serious creativity. The final form of the scale after meeting the conditions of authenticity, consistency and capacity to distinguish 52 items. The items are divided into 6 dimensions which are challenge, mental motivation, reason, liberation, fluency, style of thinking and synchronization. The researchers recommend using scale to determine serious creativity and benefit from the results to instruct and train the sport people whose serious creativity is low. The correlations between serious creativity and other variables such as worry, ego, and psychological security etc. might be investigated.

Keywords: Constructing Serious, Creativity Scale, Athletes

Introduction and Importance of the Study

It is mandatory to pay attention to professional players who are able to overcome stress and problems in complex and changing sport circumstances in different sport champions and competitions. Sport people who are able to face stress without affecting their sport level are stars to their teams and counties. They are also one of the factors to win sport competition particularly if we make those players ideals for many players and cornerstones to develop and achieve a higher level of sport. Therefore, we need open-minded players who are able to produce new and creative solutions and use active and unusual procedures. Despite the global advances, their requirements of new ideas in the sport world, our training methods and means particularly in the field of psychology are traditional and are working at a slower pace than the levels and circumstances of global competitions. Thus, training and psychological measurements in the Iraqi teams concentrate often on the scientific training and transformation of these ideas than on their generation, use or encouraging thinking or creativity.

Some studies have confirmed that athletes become more idea consumers than active thinkers. Therefore, we need to ensure to teach them thinking and reacting to competing environment and its effect on creative sport. This might enable them to think creatively, not traditionally, to generate new and less spread ideas and to best-improve their skills and

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bodies, because the distribution of these ideas reduces their values (Al-Zayat, 2009: 237). Thus, serious creativity has become one of the most attention attracting topics. This appears through establishing many training centers by De Bono in many countries to train people to think and be creative. This is because training is one of the fundamental requirements for change and success in different life aspects (El-Deeb, 2005:19). Serious creativity ranks first in the future among all players because it puts them in continuing competitions to create ideas, concepts or new creative methods that qualify them to compete their colleagues.

We reach these concepts through data analysis because the brain only sees what it is ready to see and sport people should have the ability to create ideas which make them wish to use new methods and tools of serious creativity in producing, generating and employing new ideas. Therefore, training on the skills of serious creativity must be a part of sport training in all stages (De Bono, 2005:411-415).

The starting point to serious creativity to generate new ideas is targeting concertation which is of two types: the first concentrates on general regions and the second, which is the most important, is the targeting concertation. The latter is restricted by an aim which the sportsman attempts to achieve. Experience based creativity is an opportunity to learn, teach and reach success and creativity in performance (Odeh, 2015:137).

The essence of motivating creativity is the belief of the existence of other ways to do things. The current one is not the only one and the absence of motivating creativity leads to the belief that the current way is the best and only one. This means getting good performance stops the search for a better and more creative performance.

Athletes must depend on themselves to acquire knowledge and ideas to discover and organize them. They must also control their results in selecting what is suitable for their abilities and able to make right decisions suitable for their style of thinking. They must also be able to be confident in themselves and are able to take responsibilities and decisions. In particular, serious creative thinking is a mean of thinking which could be practiced and acquired. Athletes can look at things from different perspectives and develop them to new ideas and designs. In addition, creativity is applicable or usable and contradicts usual thinking because the person tries to generate different ideas depending on mind or usual thinking. These ideas provide good solutions for the posed problems.

It is supposed that creative thinking of athletes through the creative bases means the intentional or multi use of this type of creativity. Also, serious creativity can be used in two ways: the specialist can use a group of organized models to change the concepts and awareness to generate new awareness. The other is the discovery of possibilities and multi-methods than one method (Abu Rayash, 2007:328).

The above paragraphs make it clear that active and effective role of serious creativity is important. It is one of the psychological variables which the player specializes in his reaction to the sport environment. Different players are different in these extent of the endurance of training and competition stress, their adaptation to it and producing distinguished creative performance. Therefore, it is important to measure serious creativity of Iraqi athlete applicants. However, the lack of a scale to measure raises the importance of the study. Thus it is necessary to contribute in the psychological guidance of the athletes.

The problem

Serious creativity is one of the important psychological concepts linked to the athlete personality in terms of reacting with the events such as training or competition. Athletes with creativity ability can cope with the training and competition stress by thinking of new ideas to the problem. This enables them to keep the required level of psychology and to perform better in sports and achieve their aims. In contrast, players with no serious creativity cannot cope with these

types of stress positively. This leads to frustration or loss and this in turn leads to failure in sport performance. Because of the importance of this concept to athlmain steps to that is to build a scale for it. Hence the study problem arises "which is the lack of an Iraqi scale tool in this field, thus the researchers aim to build a scale for athletes applying to some games in Iraq".

Aims of the study

The study aims to build a scale to calculate serious creativity for the applicants in Iraq.

Research terms

Serious creativity: Serious creativity is a group of techniques or specific methods and tools designed to be executed to produce new ideas and concepts. The systematic methods use specific tools and strategies to develop serious creativity (Abu Gado., and Nofal, 2007:37).

Procedures of the study

Method of research: The study uses a descriptive method with survey because it is suitable for the problem of the study.

The study sample: The study was conducted by a sample of a group of 425 applicants in the Iraqi champions in 2019-2020 to some individual and team games. The sample was randomly selected: 200 team players and 225 individual game players. They were all registered with union of sports for the games (18-30 years) and are current trainers and competitors as can be seen in table 1:

Table 1: The distribution of the study sample according to type and level of sport

No.	Activity type	Sport level		Total number
		First excellent degree	Team	
1	Handball	18	19	37
2	Basket ball	5	14	19
3	Volleyball	20	4	24
4	Football	80	20	100
5	Taekwondo	5	14	19
6	Wrestling	10	9	19
7	Futsal	7	13	20
8	Fencing	4	13	17
9	Archery and Shooting	3	18	21
10	Rowing and Canoe	2	16	18
11	Judo	13	10	23
12	Gymnastics	5	6	11
13	Squash	4	5	9
14	Table tennis	3	8	11
15	Athletes	31	11	42
16	Boxing	8	12	20
17	Weightlifting	12	13	15

Total		**225**	**190**	**425**

Procedures for the construction of scale of serious creativity for athletes

1. Determine the aim of this scale

The construction of the scale aims to determine serious creativity for the players and its use by the clubs, trainers and specialists. It is a series of marks at regular intervals for measuring serious creativity during training and competition.

2. Determining the scale dimensions

De Bono's theory was used to suggest a number of concepts of serious creativity for players to determine athletic serious creativity. We looked at many general psychological studies, athletic psychological and psychological scale studies such as De Bono (1992;1995). We also looked at studies such as (Fishkin، Cramond، & Olszewski-Kubilius, 1999); (Runco & Pritzker, 1999), (Zainab Al – Akra, 2017). Arabic studies are (Al Saadi, 2013); (Al-Tamimi, 2013) and (Nofal, 2009). In the light of these studies, 15 dimensions were suggested initially and were shown with the theories to 15 experts in general psychology, athletic psychology and in assessment and evaluation to determine the validity of the suggested dimensions as in table 2:

Table 2: Experts opinion and values (K2) calculated and table ones for the scale dimensions

Dimensions	No.	Statistical significance	K^2 Table	K^2 Calculated	Experts' opinions	
					Invalid	Valid
Random	Disagree	1		1.66	5	10
Mean	Challenge	2		15	Zero	15
Random	Training infrastructure	3		1.66	5	10
Mean	Mental Motivation	4		15	Zero	15
Random	Relation with the trainer	5		0.6	9	6
Random	Fear	6		0.06	7	8
Random	Competition worry	7		0.06	8	7
Random	Harmony	8	3.84	3.26	11	4
Random	hesitation	9		6،0	6	9
Mean	Method of thinking	10		8.06	2	13
Random	Behavior	11		1.66	5	10
Mean	Freedom	12		8.06	2	13
Mean	coincidence	13		15	Zero	15
Random	Psychological worry	14		0.6	6	9
Mean	Fluency	15		11.26	1	14

K^2 value is 3.84 under free degree (1) and Statistical significance of (0.05).

Six dimensions were approved by the experts for their validity in measuring serious creativity for athletes in sport fields: challenge, mental motivation, mean of communication, freedom, synchronization and fluency. The k2 values

of these dimensions are bigger than the tabular values at (1) degree with a statistical significance of 0.05 which is 3.84 in favor of the response (valid). They showed mean differences between majority and minority of the experts.

The dimensions were shown to 15 experts who are asked to give rate importance according to a scale from 0-9 and 9 is given to the most important and 0 for the absence of importance. The total score was calculated as follows: 15x9=153 as in table 3:

Table 3 the importance of rate

No	Rate importance	Score out of the whole score	Dimension
1	100	135	Mental motivation
2	100	135	Challenge
3	97.77	132	Fluency
4	96.29	130	Coincidence
5	94.07	127	Freedom
6	91.85	124	Means of thinking
7	579.98	783	Total

3. Designing the initial formula for terms of scale as follows:

- **Preparing scale expressions**

The scale related phrases were distributed according to rate importance for each dimension. Each phrase was written based on references in terms of the theoretical definitions for serious creativity and its dimensions to find field phrases to benefit in constructing scale expressions. A survey was built; it contains definitions and examples for the six suggested dimensions distributed to 23 players of the Republic Club'; (5) boxing, (8) wrestling, (6) judo and (4) gymnastic on 19/10/ 2019-21/10/2019. The sample selection was random and they were asked to give similar expressions applicable to applicants according to the formed examples for the phrases and for the dimensions.

- **Mean of formulating expressions and their bases**

Likert method (Penta assessment scale) was followed in building the serious creativity scale because it provides more harmony and allows a bigger difference between the individuals. Also, the respondents can signal their feeling and its intense. It is characterized by high intention and stability. 120 expressions were formulated divided on the six dimensions according to their importance of rate as in table 4:

Table 4: dimensions and percentages of the rate importance and the number of expression.

No.	No. of expressions	Percentages of rate importance	Dimensions
1.	21	%17.24	Mental motivation
1.	21	%17.24	Challenge

2.	**20**	**%16.86**	**Fluency**
3.	**20**	**%16.60**	**Coincidence**
4.	**19**	**%16.22**	**freedom**
5.	**19**	**%15.84**	**Way of thinking**
6.	**120**	**%100**	**Total**

- **Validity of the expressions**

The scale in its primary form was shown to 17 experts in athletic psychology, assessment and evaluation and specialists in some sport games to judge their validity in terms of formation and suitability to calculate the dimensions of serious creativity. Then K2 was used to show the differences in the majority and minority, if a statistical significance is 0.05 as in table 5:

Table 5: K2 value for the opinions of the experts about the validity of scale expressions

No.	Dimensions	statistical significance	Calculated K^2	Expert opinions		Phrase no.
				Disagree	Agree	
1	**Mean**	**Mental motivation**	**13.23**	**1**	**16**	**،17 ،16 ،14 ،13 ،12 ،10 ،9 ،8 ،6 ،3 ،2 19 ،18**
2	**Random**		**0.52**	**7**	**10**	**21 ،20 ،15 ،11 ،7 ،5 ،4 ،1**
3	**Mean**	**challenge**	**9.94**	**2**	**15**	**،21 ،18 ،17 ،15،16 ،12 ،8،9 ،7 ،6، 2، 1**
4	**Random**		**1.47**	**6**	**11**	**20 ،19 ،14 ،13 ،11 ،10 ،5 ،4 ،3**
5	**Mean**	**fluency**	**17**	**0**	**17**	**19 ،17 ،13 ،12 ،11 ،10 ،9 ،7 ،6 ،4**
6	**Random**		**2.88**	**5**	**12**	**20 ،18 ،16 ،15 ،14 ،8 ،5 ،3 ،2**
7	**Mean**	**coincidence**	**7.11**	**3**	**14**	**18 ،14 ،13 ،12 ،10 ،9 ،8 ،7 ،4 ،3 ،1**
8	**Random**		**1.47**	**6**	**11**	**20 ،19 ،17 ،16 ،15 ،11 ،6 ،5 ،2**
9	**Mean**	**freedom**	**13.23**	**1**	**16**	**12 ،11 ،9 ،7 ،6 ،4 ،3 ،1**
10	**Random**		**0.52**	**7**	**10**	**19 ،18 ،17 ،16 ،15 ،14 ،13 ،10 ،8 ،5 ،2**
11	**Mean**	**Way of thinking**	**7.11**	**3**	**14**	**11 ،9 ،8 ،7 ،4 ،3 ،1**
12	**Random**		**0.50**	**8**	**9**	**،18 ،17 ،16 ،15 ،14 ،13 ،12 ،10 ،6 ،5 ،2 19**

K2 table value at (1) degree and rate of error (0.05) =3.84

In compliance with the expert opinions, 58 of 62 expressions were deleted to form the scale in its primary form before applications. They were distributed on the six dimensions: 13 mental motivations, 12 challenge expressions, 11 coincidence expressions, 8 freedom expressions and 7 mean of thinking expressions. They positive expressions were 45 as follows:

،43 ،42 ،40 ،39 ،36 ،35 ،34 ،33 ،30 ،28 ،27 ،26 ،25 ،24 ،22 ،19 ،18 ،17 ،15 ،14 ،13 ،12 ،11 ،10 ،9 ،8 ،7 ،6 ،5 ،2 ،1 64 ،61 ،60 ،59 ،58 ،57 ،55 ،54 ،53 ،51 ،50 ،49 ،48 ،47. The number of negative expressions are17 which contain ،20 ،16 ،3 62 ،56 ،52 ،46 ،45 ،44 ،41 ،38 ،37 ،32 31 ،29 ،23 ،21.

- **Instructions of athlete creative scale**

We made the instructions clear and easy to understand and we stated it is mandatory to answer very clearly and accurately. We also indicated that answers are confidential and are research purpose only and ensured not to write their names. The name or dimensions were not revealed clearly.

4. Survey experiment

The scale was applied to the sample of 26, 8 of them are from Karkh Boxing Club and 6 of the Judo Diyala Club, 12 from Adamiyah Club, 4 from swimming and 8 from the boxing club. They were excluded from the initial experiment from 16/12/2014 -18/12/2014. It became clear that the scale instruction and expressions are clear and the answers range from 20-25 minutes. The average is 22.5 and in this way the scale, its instruction and expressions (62) are applicable to the sample of construction.

The first scale was applied on the construction sample of 425 players from 20/12/2019-10/2/2020. The aim of this is to conduct statistical analysis for its expressions.

5. Ratification of the scale

The overall scores were found for every form by the use of the prepared ratification key as in table 6:

Table 6: the weights of the response on the positive and negative expressions.

Alternatives	Totally disagree	Disagree	Neutral	Agree	Totally agree
positive expressions	**1**	**2**	**3**	**4**	**5**
negative expressions	**5**	**4**	**3**	**2**	**1**

In order to get the total score for the scale, all the scores the payers get in their answers for the 62 expressions of the scale are collected. Thus, the highest score they get is 310 and the least one is 62; 15 forms where excluded because they did not comply with the requirements. The remaining 410 forms are valid for statistical analysis:

6. Psychometric properties of the scale

1- Authenticity of content

The researchers showed the documents to several experts who verified scale and contented authenticity. The experts are specialists in general and athlete psychology and in assessment and evaluation to do the ratifications of the expressions and representation of the dimensions they measure.

2- The distinguishing power of phrases

After the modification of the scale, 15 forms were excluded because they did not meet the conditions. The method of two end groups was used to distinguish between the expressions. The scores were arranged in descending order. The percentage of 27 for the highest score and 27 % of the lowest scores were selected. The number of the players was 111 for each group. To calculate the factor of disguising by T-TEST for both samples by the use of Social Sciences Statistical Package (SPSS). The T value for the statistical function was a sign to distinguish the expressions. Table shows calculated T-value and when compared with T-value of the table at freedom of 220 and significance level 0.05 which is 1.96, all the expressions were accepted.

Table 7 Arithmetic mean, deviations, and calculated T-vale for the highest and lowest groups and the mean for scale expression.

Phrase no.	Statistical significance	Calculated T-value	Lowest group		Highest group	
			A	-S	A	-S
1.	Distinctive	17.89	0.93	2.75	0.50	4.54
2.	Distinctive	17.58	0.97	2.68	0.50	4.50
3.	Distinctive	12.88	1.20	2.95	0.50	4.54
4.	Distinctive	22.07	0.90	2.41	0.49	4.57
5.	Distinctive	14.09	1.10	2.96	0.49	4.57
6.	Distinctive	14.91	1.02	2.91	0.50	4.52
7.	Distinctive	12.33	1.02	2.14	0.52	4.48
8.	Distinctive	15.70	1.04	2.71	0.57	4.47
9.	Distinctive	14.93	1.08	2.78	0.54	4.50
10.	Distinctive	18.21	0.97	2.58	0.55	4.50
11.	Distinctive	20.37	0.91	2.51	0.53	4.56
12.	Distinctive	19.19	0.93	2.51	0.57	4.50
13.	Distinctive	15.13	0.85	3.06	0.55	4.51
14.	Distinctive	16.73	0.80	2.90	0.60	4.49
15.	Distinctive	12.79	0.86	3.20	0.56	4.45
16.	Distinctive	17.77	0.85	2.68	0.60	4.44
17.	Distinctive	16.86	0.82	2.92	0.55	4.50
18.	Distinctive	12.45	1.05	3.10	0.55	4.49
19.	Distinctive	14.12	0.93	3.05	0.55	4.48
20.	Distinctive	14.98	0.94	2.93	0.54	4.47
21.	Distinctive	11.38	0.96	3.27	0.52	4.45
22.	Distinctive	17.62	0.92	2.66	0.55	4.45
23.	Distinctive	9.80	1.06	3.28	0.57	4.41
24.	Distinctive	13.99	0.94	2.99	0.53	4.42
25.	Distinctive	18.44	0.81	2.66	0.58	4.40
26.	Distinctive	11.36	0.90	3.30	0.51	4.41
27.	Distinctive	11.70	0.90	3.29	0.52	4.45
28.	Distinctive	15.45	0.85	3.00	0.54	4.48
29.	Distinctive	19.92	0.90	2.46	0.53	4.44
30.	Distinctive	12.55	0.93	3.08	0.55	4.38
31.	Distinctive	9.62	1.01	3.29	0.54	4.34
32.	Distinctive	16.97	0.86	2.84	0.53	4.47
33.	Distinctive	17.25	0.83	2.82	0.51	4.42
34.	Distinctive	15.34	0.92	2.96	0.54	4.50

35.	**Distinctive**	**13.42**	**0.93**	**3.11**	**0.57**	**4.49**
36.	**Distinctive**	**15.48**	**1.08**	**2.64**	**0.55**	**4.41**
37.	**Distinctive**	**10.08**	**0.98**	**3.29**	**0.59**	**4.39**
38.	**Distinctive**	**12.36**	**0.99**	**3.09**	**0.56**	**4.42**
39.	**Distinctive**	**10.94**	**0.78**	**3.44**	**0.53**	**4.42**
40.	**Distinctive**	**13.42**	**0.89**	**3.06**	**0.52**	**4.39**
41.	**Distinctive**	**9.85**	**0.91**	**3.48**	**0.51**	**4.46**
42.	**Distinctive**	**14.20**	**0.94**	**3.10**	**0.52**	**4.55**
43.	**Distinctive**	**17.56**	**0.85**	**2.84**	**0.52**	**4.50**
44.	**Distinctive**	**9.11**	**1.15**	**3.31**	**0.56**	**4.41**
45.	**Distinctive**	**8.22**	**0.99**	**3.50**	**0.59**	**4.40**
46.	**Distinctive**	**10.46**	**1.07**	**3.18**	**0.59**	**4.39**
47.	**Distinctive**	**10.12**	**0.99**	**3.39**	**0.59**	**4.50**
48.	**Distinctive**	**9.66**	**1.08**	**3.32**	**0.57**	**4.43**
49.	**Distinctive**	**10.58**	**0.94**	**3.29**	**0.54**	**4.39**
50.	**Distinctive**	**10.64**	**0.96**	**3.30**	**0.55**	**4.42**
51.	**Distinctive**	**11.78**	**1.00**	**3.14**	**0.58**	**4.43**
52.	**Distinctive**	**17.33**	**0.83**	**2.70**	**0.57**	**4.35**
53.	**Distinctive**	**18.50**	**0.84**	**2.65**	**0.54**	**4.42**
54.	**Distinctive**	**17.45**	**0.96**	**2.53**	**0.55**	**4.37**
55.	**Distinctive**	**11.45**	**1.03**	**3.05**	**0.56**	**4.33**
56.	**Distinctive**	**13.79**	**1.00**	**2.79**	**0.57**	**4.29**
57.	**Distinctive**	**18.90**	**0.90**	**2.47**	**0.55**	**4.37**
58.	**Distinctive**	**4.99**	**1.32**	**2.97**	**1.18**	**3.81**
59.	**Distinctive**	**6.71**	**1.20**	**3.09**	**0.90**	**4.05**
60.	**Distinctive**	**7.56**	**1.19**	**2.95**	**1.02**	**4.07**
61.	**Distinctive**	**7.17**	**1.17**	**3.18**	**0.85**	**4.18**
62.	**Distinctive**	**6.13**	**1.28**	**3.34**	**0.78**	**4.22**

Calculated table T-value (1.96) = statistical significance at (05‹0)and freedom (220)

3- Internal consistency (correlation of score for each term with the overall scale of scale:

The coherence factor of the internal consistency shows that the extent of homogeneity of expressions in their measurement of the measured behavioral phenomenon. This method is characterized by the ability to highlight the correlation between the scale statements and its overall degree. It provides a homogeneous scale in its expressions because each phrase measures the same behavioral dimension that measures the whole scale (Jasim, 2103: 116). The total quantity of scale is considered to be instantaneous measurements through its association with the players' scores on the expressions (Awad, 1990: 57).

Pearson Correlation Coefficient was used for all the (410) sample members using SPSS. Then this coefficient was compared with the tabular R-value at the degree of freedom (408) and the level of significance (0.05) of (0.098). Thus, we find that the extracted values have achieved mean because their calculated values are greater than their table values, and in the light of this criterion, none of the expressions has been excluded from the scale as in table 9.

Table 9: Pearson correlation coefficient among the scale statements in the overall scale of the scale

Expression	Correlation	**Statistical significance type**	Correlation	**Expression**	**Statistical significance type**
1	**0.75***	**Mean**	**0.74***	**32**	**Mean**
2	**0.72***	**Mean**	**0.71***	**33**	**Mean**
3	**0.66***	**Mean**	**0.68***	**34**	**Mean**
4	**0.78***	**Mean**	**0.64***	**35**	**Mean**
5	**0.67***	**Mean**	**0.69***	**36**	**Mean**
6	**0.70***	**Mean**	**0.56***	**37**	**Mean**
7	**0.62***	**Mean**	**0.63***	**38**	**Mean**
8	**0.69***	**Mean**	**0.54***	**39**	**Mean**
9	**0.72***	**Mean**	**0.60***	**40**	**Mean**
10	**0.76***	**Mean**	**0.51***	**41**	**Mean**
11	**0.78***	**Mean**	**0.62***	**42**	**Mean**
12	**0.77***	**Mean**	**0.67***	**43**	**Mean**
13	**0.68***	**Mean**	**0.50***	**44**	**Mean**
14	**0.73***	**Mean**	**0.49***	**45**	**Mean**
15	**0.64***	**Mean**	**0.54***	**46**	**Mean**
16	**0.72***	**Mean**	**0.53***	**47**	**Mean**
17	**0.75***	**Mean**	**0.52***	**48**	**Mean**
18	**0.64***	**Mean**	**0.53***	**49**	**Mean**
19	**0.65***	**Mean**	**0.56***	**50**	**Mean**
20	**0.71***	**Mean**	**0.59***	**51**	**Mean**
21	**0.62***	**Mean**	**0.74***	**52**	**Mean**
22	**0.74***	**Mean**	**0.76***	**53**	**Mean**
23	**0.58***	**Mean**	**0.73***	**54**	**Mean**
24	**0.66***	**Mean**	**0.63***	**55**	**Mean**
25	**0.75***	**Mean**	**0.70***	**56**	**Mean**
26	**0.57***	**Mean**	**0.74***	**57**	**Mean**
27	**0.59***	**Mean**	**0.32***	**58**	**Mean**
28	**0.72***	**Mean**	**0.39***	**59**	**Mean**
29	**0.78***	**Mean**	**0.38***	**60**	**Mean**

30	**0.64***	**Mean**	**0.40***	**61**	**Mean**
31	**0.55***	**Mean**	**0.36***	**62**	**Mean**

Table R-value at the significance level (0.05) and the degree of freedom (408) = 0.098

- **Candidate phrases for the analysis**: The expressions shown in table (10) distributed on the six dimensions of the analysis were selected.

Table 10: Dimensions of the scale with the number of candidate phrases for global analysis

No	No.	Dimension
1	**13**	**Mental motivation**
2	**12**	**Challenge**
3	**11**	**Fluency**
4	**11**	**Coincidence**
5	**8**	**Freedom**
6	**7**	**Means of thinking**
	62	**Total**

7. Stability of scale

- **Half segmentation method:** The correlation coefficient between the sum of the scores of (individual and positive expressions) was calculated using Person method by SPSS. Also, the correlation coefficient reached 0.85, and because the calculated correlation coefficient indicates stability for only half of the test. To obtain a total stability of the test Cyberman-Brown equation was applied. The value of the test stability coefficient was 0.918, which is a high stability index for the test.
- **Cronbach's alpha:** The scores for the scale-based sample that are valid for statistical work, of 410 players were adopted to calculate the stability of the scale of serious creativity for athletes. The stability factor value was 0.98 which is a high and reliable stability factor.

8. **Statistical means**: All statistical data was processed using SPSS.

- **Results, analysis and discussion of the scale of serious creativity for athletes:**

- **Factor analysis of the scale of serious creativity for athletes.**

410 forms were subjected to global analysis containing the values of (62) phrases. To prepare a primary data matrix for the serious creativity scale for athletes, the initial arithmetic means, standard deviations as in table (11). They showed statistical description of the expressions included in the factor analysis.

Table 11 arithmetic means and standard deviations for the expressions of the scale of serious creativity for athletes.

No. of expressions	A	S-	No. of expressions	A	S-
1	**0.88008**	**3.7951**	**32**	**0.95564**	**3.7659**
2	**0.86441**	**3.7561**	**33**	**0.96142**	**3.7634**
3	**0.87431**	**3.8195**	**34**	**0.97668**	**3.8707**

4	**0.84226**	**3.8707**	**35**	**1.07100**	**3.6805**
5	**1.02641**	**3.6683**	**36**	**0.95178**	**3.8561**
6	**0.79446**	**3.8707**	**37**	**0.92070**	**3.8268**
7	**0.83792**	**3.8098**	**38**	**0.84854**	**3.8951**
8	**0.69490**	**3.9220**	**39**	**1.00682**	**3.7415**
9	**0.83414**	**3.7610**	**40**	**0.95876**	**3.7902**
10	**0.72927**	**3.9659**	**41**	**0.98651**	**3.7122**
11	**0.85344**	**3.8780**	**42**	**1.01478**	**3.7171**
12	**0.89886**	**3.7707**	**43**	**1.00669**	**3.7317**
13	**0.84968**	**3.8927**	**44**	**0.82542**	**3.8756**
14	**0.75410**	**3.9683**	**45**	**0.84876**	**3.8195**
15	**0.87341**	**3.8220**	**46**	**0.78662**	**3.8610**
16	**0.80594**	**3.9098**	**47**	**0.94398**	**3.7098**
17	**0.82272**	**3.8878**	**48**	**0.84639**	**3.8024**
18	**0.79194**	**3.8561**	**49**	**0.88273**	**3.8415**
19	**0.79622**	**3.9049**	**50**	**0.86302**	**3.8488**
20	**0.86316**	**3.8341**	**51**	**0.86599**	**3.8341**
21	**0.90974**	**3.6976**	**52**	**0.76873**	**3.8976**
22	**0.93884**	**3.6976**	**53**	**0.96347**	**3.6902**
23	**0.98665**	**3.6244**	**54**	**0.82040**	**3.8927**
24	**0.84573**	**3.8122**	**55**	**0.86378**	**3.8098**
25	**0.92467**	**3.7024**	**56**	**0.92836**	**3.6976**
26	**1.02373**	**3.6195**	**57**	**0.76234**	**3.8976**
27	**1.16525**	**3.6122**	**58**	**0.76298**	**3.9024**
28	**1.01008**	**3.7049**	**59**	**0.82054**	**3.8390**
29	**1.11818**	**3.6317**	**60**	**0.99125**	**3.6610**
30	**1.03685**	**3.7024**	**61**	**0.82338**	**3.8171**
31	**1.04700**	**3.8634**	**62**	**0.79244**	**3.8878**

- **Interconnection matrix for serious creativity scale for athletes:**

Factorial analysis begins with the correlative matrix of the study variables and ends with summarizing them in the concise matrix. Raw scores were used to obtain the coefficients of the variables by Person equation. As a result, there were 1891 correlation coefficients (country cells were not calculated), and the matrix included 1849 positive correlation factor D at (97.78%), (34) non-mean correlation coefficient (1.79%), and (8) non-mean, negative correlation coefficients a ratio (0.42%). That is when compared to the tabular value (0,098) with a degree of freedom (408), significance level (0.05), and a tabular value (0.128) with a level of significance (0.01).

- **Matrix of Factors prior to the Rotation of the Serious Creativity Scale for Athletes:**

In order to obtain simple global structure, H. Hotelling method (Principle Components) was used to analyze the matrix globally. H. Kaiser was utlized to determine the factors and their correct single use in the diagonal cells of the correlation matrix instead of the test stability coefficient (Al-Ansari, 1999: 11). Also, 9 factors called direct factors were used, although they cannot be explained unless they are rotated. Table (12) shows the explanation of the total variance of the un-rotated factors.

Table 12: the overall variation explaining the un-rotated factors to measure serious creativity for athletes

	Factors	Eigen Value) Latent root(	Variation rate	Cumulative percentage
1.	First	26.081	42.067	42.067
2.	Second	4.095	6.604	48.671
3.	Third	3.146	5.073	53.745
4.	Fourth	1.809	2.918	56.662
5.	Fifth	1.644	2.652	59.315
6.	Sixth	1.365	2.202	61.517
7.	Seventh	1.270	2.048	63.565
8.	Eight	1.178	1.900	65.465
9.	Ninth	1.040	1.678	67.143

Table 13: the values of the explained variance (shared) for each phrase of the scale, i.e. the amount of what has been interpreted and shared by the expressions in representing the measure of serious creativity for athletes.

Table 13: Pre-Rotation Matrix Factors for the Scale of Serious Creativity for Athletes

Phrase No	Un-rotated Factors									Explained variation
	1	2	3	4	5	6	7	8	9	
1	.756	.072	.113	-.162-	-.044-	-.155-	-.077-	.089	-.010-	.656
2	.732	-.023-	.060	-.149-	-.027-	-.159-	.165	-.171-	.079	.651
3	.670	.389	-.122-	-.080-	-.111-	-.207-	-.064-	.006	.132	.698
4	.781	-.002-	.216	-.221-	.040	-.102-	.048	-.124-	.039	.737
5	.674	.287	.010	-.098-	-.161-	-.270-	-.005-	-.077-	.350	.774
6	.710	.306	-.022-	-.102-	-.153-	-.289-	.005	-.100-	.135	.744
7	.632	.192	-.160-	-.013-	-.278-	-.188-	.149	-.082-	.103	.614
8	.698	-.123-	.164	-.171-	-.128-	.027	.033	-.050-	.088	.587
9	.731	.374	-.154-	-.049-	-.190-	-.112-	.102	-.119-	.003	.774
10	.769	-.019-	.083	-.085-	-.117-	-.101-	.200	-.120-	-.132-	.702

11	**.782**	**.036**	**.140**	**-.215-**	**-.112-**	**.016**	**.210**	**-.085-**	**-.147-**	**.764**
12	**.767**	**-.048-**	**.144**	**-.168-**	**-.090-**	**.001**	**.194**	**-.034-**	**-.138-**	**.706**
13	**.693**	**.305**	**-.081-**	**-.119-**	**-.111-**	**-.040-**	**.145**	**.037**	**-.132-**	**.648**
14	**.737**	**.009**	**.005**	**-.121-**	**-.169-**	**.067**	**.136**	**-.060-**	**-.285-**	**.694**
15	**.652**	**.128**	**-.016-**	**-.072-**	**-.140-**	**.063**	**.042**	**.258**	**-.083-**	**.546**
16	**.723**	**-.187-**	**.268**	**-.204-**	**.085**	**.061**	**.014**	**.145**	**-.066-**	**.708**
17	**.763**	**.126**	**-.058-**	**-.088-**	**-.014-**	**.018**	**.080**	**.195**	**.132**	**.672**
18	**.653**	**-.197-**	**-.110-**	**-.207-**	**-.129-**	**.052**	**.104**	**.315**	**.157**	**.674**
19	**.656**	**.218**	**-.085-**	**-.175-**	**-.044-**	**.211**	**-.008-**	**.249**	**.038**	**.626**
20	**.715**	**.144**	**-.103-**	**-.083-**	**-.072-**	**.181**	**.071**	**.218**	**.028**	**.640**
21	**.627**	**.352**	**-.266-**	**.068**	**-.116-**	**.159**	**-.195-**	**.281**	**-.017-**	**.748**
22	**.749**	**-.193-**	**.061**	**-.095-**	**.047**	**.144**	**.013**	**.126**	**-.036-**	**.643**
23	**.582**	**.456**	**-.253-**	**.098**	**-.090-**	**.149**	**-.117-**	**.166**	**.015**	**.692**
24	**.664**	**-.173-**	**.055**	**-.182-**	**-.012-**	**.291**	**-.078-**	**.177**	**.071**	**.634**
25	**.757**	**-.108-**	**.070**	**-.081-**	**.050**	**.259**	**-.079-**	**-.050-**	**-.078-**	**680.**
26	**.580**	**.283**	**-.234-**	**-.029-**	**.071**	**.394**	**-.066-**	**-.212-**	**-.079-**	**.687**
27	**.601**	**.221**	**-.271-**	**.027**	**.076**	**.333**	**.046**	**-.233-**	**-.037-**	**.659**
28	**.721**	**.230**	**-.110-**	**.085**	**.173**	**.180**	**-.014-**	**-.308-**	**-.007-**	**.674**
29	**.784**	**.053**	**.036**	**-.087-**	**.053**	**.167**	**.071**	**-.213-**	**.029**	**.708**
30	**.645**	**.142**	**.006**	**.013**	**.279**	**.096**	**.046**	**-.212-**	**.027**	**.571**
31	**.549**	**.390**	**-.138-**	**.089**	**.249**	**.153**	**-.096-**	**-.116-**	**.153**	**.612**
32	**.750**	**-.129-**	**-.025-**	**-.121-**	**.108**	**.067**	**-.037-**	**-.092-**	**.160**	**.646**
33	**.714**	**-.290-**	**.161**	**-.082-**	**.055**	**.083**	**-.059-**	**-.022-**	**.153**	**.664**
34	**.686**	**-.324-**	**.171**	**-.013-**	**.249**	**-.018-**	**-.090-**	**-.053-**	**.153**	**.702**
35	**.644**	**-.221-**	**-.073-**	**.046**	**.311**	**-.097-**	**.024**	**-.194-**	**.073**	**.621**
36	**.695**	**-.370-**	**.111**	**-.083-**	**.161**	**-.091-**	**.014**	**.167**	**.114**	**.714**
37	**.572**	**.122**	**-.352-**	**.112**	**.408**	**-.247-**	**.048**	**.117**	**-.038-**	**.723**
38	**.641**	**-.027-**	**-.308-**	**.020**	**.342**	**-.194-**	**-.039-**	**.132**	**-.016-**	**.681**
39	**.549**	**.240**	**-.297-**	**.093**	**.355**	**-.013-**	**-.051-**	**.129**	**.048**	**.603**
40	**.607**	**-.282-**	**.143**	**-.115-**	**.273**	**-.078-**	**-.050-**	**.011**	**.040**	**.566**
41	**.506**	**.118**	**-.210-**	**.252**	**.381**	**-.164-**	**.204**	**.161**	**-.197-**	**.655**
42	**.627**	**-.172-**	**.047**	**.126**	**.114**	**-.199-**	**.268**	**.112**	**-.272-**	**.651**
43	**.670**	**-.270-**	**.237**	**.043**	**.176**	**-.034-**	**.125**	**.105**	**-.124-**	**.653**
44	**.508**	**-.507-**	**-.216-**	**.217**	**-.090-**	**.026**	**.218**	**-.041-**	**-.038-**	**.668**
45	**.495**	**-.147-**	**-.395-**	**.365**	**-.222-**	**-.021-**	**.206**	**-.061-**	**.073**	**.703**
46	**.552**	**-.570-**	**-.102-**	**.148**	**-.127-**	**.092**	**.031**	**.005**	**.159**	**.713**
47	**.540**	**-.299-**	**-.329-**	**.360**	**-.217-**	**-.034-**	**.038**	**.007**	**.194**	**.707**

48	.536	-.440-	-.264-	.253	-.109-	.081	-.064-	-.097-	.199	.686
49	.534	-.331-	-.167-	.263	-.159-	.075	-.149-	.145	-.086-	.573
50	.576	-.289-	-.201-	.198	-.142-	.014	-.045-	-.034-	-.234-	.573
51	.593	-.525-	.091	.142	-.142-	-.002-	-.108-	-.106-	-.096-	.708
52	.743	-.037-	.152	.066	-.104-	.002	-.187-	-.152-	-.274-	.724
53	.763	-.039-	.153	.077	-.051-	-.036-	-.305-	-.061-	-.041-	.716
54	.734	-.028-	.158	-.066-	.000	-.125-	-.333-	-.018-	-.073-	.701
55	.634	.330	-.141-	.171	-.130-	-.153-	-.238-	-.006-	-.238-	.714
56	.701	.025	.021	.112	-.050-	-.234-	-.370-	-.057-	-.041-	.704
57	.740	-.106-	.236	.002	-.066-	-.157-	-.265-	.026	-.012-	.715
58	.283	.187	.597	.247	.017	.032	-.197-	.057	-.043-	.578
59	.362	.356	.457	.365	-.055-	.015	.087	.040	-.019-	.613
60	.341	.113	.671	.327	-.016-	.141	.114	.080	.156	.751
61	.361	.291	.379	.459	.001	.014	.110	.073	.151	.610
62	.319	.361	.499	.285	.052	.086	.257	.007	.058	.642

- **Matrix of factors after rotation for the scale of creativity for athletes:**

The orthogonal method of Varimax for Kaiser was used after rotation, and 9 matrix factors were obtained for serious creativity for athletes after rotation.

It is clear from table 14 that the Eigen values, the explanatory variation ratio and the cumulative ratios of the un-rotated factors have changed in the matrix. Thus, the ratios of variations for each un-rotated factor changes after rotation and this change means that the difference is distributed over the rest of the factors after rotation. According to this change, the explanatory factors were determined, based on the saturation of the scale statements on it, "the factor upon which the saturation happened on at least three significant tests and the interpretation of the factors depends on the saturation that is equal to or greater than ± 0.50" (Al-Tikriti, 1999: 369).

Table 14: the overall variation explaining the factors after rotation of the scale of serious creativity for athletes

Eigen values	Variation rate	Cumulative rate	Factor No	No
1	First	11.443	18.457	18.457
2	Second	6.438	10.384	28.842
3	Third	5.058	8.158	37.000
4	Fourth	4.413	7.117	44.118
5	Fifth	3.585	5.782	49.899
6	Sixth	3.363	5.424	55.324
7	Seventh	3.354	5.410	60.733
8	Eighth	2.293	3.699	64.432
9	Ninth	1.681	2.711	67.143

Table 15 shows the values of the explaining variance (shared) for the factors after rotation for each phrase of the scale and the values of what has been interpreted and shared by the expressions in representing the measure of serious creativity for athletes. The interpreted variation value is high for all expressions.

Table 15: Post-Rotation Matrix Factors Scale for Serious Creativity of Athletes

Phrase No	Post-Rotation Factors									Explained variation
	1	2	3	4	5	6	7	8	9	
1	.105	.238	.060	.096	.136	.167	.249	.445	.519	.656
2	.411	.507*	.176	.194	.098	.131	.081	.010	.350	.651
3	.181	.661*	.043	.229	.113	.227	.267	.194	.026-	.698
4	.651*	.440	.041	.210	.166	.101	.055	.105	.149	.737
5	.293	.752*	.093	.149	.181	.109	.136	.081	.149-	.774
6	.275	.729*	.073	.182	.144	.168	.132	.177	.038	.744
7	.154	.650*	.272	.166	.081	.107	.168	.050	.134	.614
8	107.	.067	.194	.151	.127	-.060-	.155	.349	.588	.587
9	.159	.673*	.142	.350	.127	.173	.230	.129	.191	.774
10	.201.	.446	.222	.191	.153	.113	.522	.089	.245	.702
11	.426	.540*	.105	.248	.152	.042	.179	.045	.399	.764
12	.363	.564*	.157	.185	.153	.069	.175	.051	.369	.706
13	.214	.502*	.055	.272	.121	.203	.324	.145	.303	.648
14	.158	.328	.203	.272	.075	.054	.234	.414	.460	.694
15	.203	.115	.137	.123	.146	.138	.474	.305	.316	.546
16	.735*	.136	.074	.082	.163	.097	.243	.098	.180	.708
17	.424	.416	.170	.200	.148	.239	.413	.005	.033	.672
18	.518*	.282	.299	.009-	-.059-	.093	.463	.092-	.041	.674
19	.561*	.293	.045	.289	.086	.131	.333	.039	.058	.626
20	.511 *	.310	.179	.275	.122	.162	.347	.015	.117	.640
21	*.622	.066	.162	.320	.101	.231	.305	.267	.017	.748
22	.625 *	.128	.247	.192	.096	.134	.301	.083	-.114-	643.
23	*.523	.360	.114	.395	.156	.233	.035	.200	.012	.692
24	. 602*	.078	.193	.220	.048	-.015-	.417	.050	-.012-	.634
25	.587*	.112	.209	.394	.114	.051	.242	.172	.143	680.
26	.155	.180	.100	.718*	.026	.099	.268	.115	.101	.687
27	.160	.217	.198	.682*	.033	.153	.204	.028	.119	.659
28	.291	.295	.163	.661*	.175	.238	.061	.137	.070	.674
29	.488	.329	.175	.511*	.157	.090	.120	.048	.147	.708
30	.048	.229	.065	.046	.183	.282	.013	.494	.390	.571
31	.139	.271	.009	.565*	.193	.310	.179	.089	-.161-	.612

32	.321	.281	.237	.603*	.029	.145	.130	.057	-.043-	.646
33	.170	.162	.276	.705*	.124	.035	.113	.080	-.036-	.664
34	.152	.094	.245	.729*	.135	.196	.025-	.108	-.100-	.702
35	.277	.171	.284	.532*	.016	.359	-.136	.060	-.011-	.621
36	.000	.134	.275	.733*	.068	.243	.137	.036	-.008-	.714
37	.201	.247	.148	.205	-.036-	.731*	.120	.084	.008	.723
38	.362	.220	.199	.178	-.098-	.613*	.165	.133	-.016-	.681
39	.165	.194	.080	.349	.041	.569*	.261	.084	-.101-	.603
40	.243	.085	.124	.081	.050	.683*	-.001	.096	-.002-	.566
41	.134	.104	.164	.161	.148	.705*	.111	.030	.204	.655
42	.417	.156	.280	-.025-	.179	.410	.052	.064	.409	.651
43	.255	.045	.221	.028	.246	.641*	.075	.070	.234	.653
44	.348	.033	.000	.055	-.054-	.688*	.005	-.055	.209	.668
45	.010	.276	.290.	.170	.026	.701*	.099	-.028	.107	.703
46	.500	.030	.000	.031	-.025-	.674*	.076	-.001	-.018-	.713
47	.163	.226	.100	.081	.019	.759*	.122	.056	-.067-	.707
48	.333	.088	.713*	.171	-.059-	.062	.042	.078	-.120-	.686
49	.279	-.004	.581*	.047	.024	.108	.250	.275	.067	.573
50	.276	.082	.540*	.145	-.036-	.139	.117	.277	.258	.573
51	.219	.024	.545*	.026	.056	-.045-	.127	.306	.497	.708
52	.452	.231	.154	.270	.202	.046	-.041	.466	.329	.724
53	.011	.267	.504*	.219	.223	.083	.086	.461	.256	.716
54	.021	.295	.551*	.148	.129	.120	.142	.477	.101	.701
55	.048	.041	518*.	.259	.152	.269	.246	.411	.222	.714
56	.104	.365	.226	.138	.369	.200	.086	547.	-.085-	.704
57	.033	.302	.186	.040	.581*	.082	.127	.423	.218	.715
58	.222	004-.	-.126-	.014	.637*	-.049-	.039	.319	-.018-	.578
59	.053	.181	-.012-	.097	.726*	.061	.081	.133	.109	.613
60	.289	.023	.027	.011	.809*	-.093-	.047	-.013	-.012-	.751
61	.047	.167	.108	.085	.732*	.131	.071	.037	-.046-	.610
62	.101	.155	-.092-	.146	.743*	.065	.035	-.088	.115	.642

- **Conditions to accept the factors of expressions for athlete serious creativity (Majeed, and Salman, 1992:287).**

1- To be accepted, the factor must be saturated in three significant tests (expressions) at least.

2- The factors in this study are interpreted on the basis of high saturation which are equal to, or greater than, 0.50±.

3- Using the matrix of factors after rotation in the interpretation of the results after arranging them in a descending order.

Six factors that make up the scale of serious creativity for athletes have been accepted. This confirms previous studies that state serious creativity for athletes is a multi-dimensional concept. Instructions were followed in accepting and interpreting the factors and saturation of phrases on each factor is arranged in a descending order to be easy to understand. The factors were explained as follows:

- **The first factor**

The first factor consists of 10 phrases with the highest saturation in compliance with the approved requirements of the interpretation at significant values (+0.50) or higher, at a rate of 16.13% of the total, whose saturation range is 0.511- 0.735. This factor is explained as 18.457% of the total variance.

By examining the expressions of the first factor, we find that 9 of them are saturated by the factor and challenge is one phrase which is phrase number 4 belongs to the dimension (mental motivation). In light of these expressions, it was called **(the challenge)** dimension, and that the findings are consistent (Ratib, 2007, 337-343) who state that the player's ability of challenging helps to develop performance through various methods, the most important of which is raising positive emotions, helps to focus attention and affects building achieving aims with great creativity. In contrast, players who lack challenge tend to set easy goals, therefore they do not exert their utmost effort and nor do they put the maximum energy. The achievement of the challenge and serious creativity of the players depends mainly on the development and improvement of performance, and this is achieved through setting realistic goals that are seriously trained to be achieved.

The researcher believes that the player who has serious creativity are knowledgeable and can develop challenge, trusts in capabilities, skills, positive effectiveness. They will have thrill in confrontation and challenge to solve problems and challenges of sports competitions to the point where they seek confrontations in other fields than the sports to wind and continue learning. Also, they are able to make the right decisions in strong and difficult competitions.

- **Interpretation of the second factor**

The second factor consists of 9 expressions with the highest saturation according to the approved conditions for the interpretation. The significant value was (± 0.50) or more, and at a rate of (14.52%) of the total number of expressions. Their saturation ranges from 0.502 to 0.752. This factor 10.38% was explained of the total variance.

Testing the phrases of the second factor shows that it is the factor (mental motivation). Therefore, it was named the dimension of **(mental motivation)**. This result is consistent with (Abdel-Khaleq and Zahrieh's, 2007), cited in De Bono (1998) stating that mental motivation is the ability to generate many ideas and not one for some people without others, it is a capacity that exceeds the limits of intelligence, as it motivates the athlete to think in a certain way. Thus, there are many creative players whose place was internal self (excellent happiness) which is exultation of global sport achievement.

Therefore, the existence of a state of mental motivation in the athlete motivates looking at more alternatives, when others are satisfied with what is present. An important aspect of achieving mental motivation is the desire to stop, and look at things that no one paid attention to because this type of focus is an additional source of serious creativity in the absence of organized strategies. Thus, (9) phrases were added to the final scale.

- **Interpretation of the third factor**

The third factor consists of 7 phrases with the highest saturation according to the approved conditions for the interpretation. The significant value was (± 0.50) or more, and at a rate of (11.29%) of the total number of phrases. Their saturation ranges from 0.504 to 0.713. This factor 8.158% was explained of the total variance.

The analysis of the expressions of the third factor shows that the factor **(freedom)**. This result is consistent with (De Bono's, 2005) idea that freedom from restrictions, suppress, frustration, fear and threat makes the person creative because the brain in these cases is more creative and thus without doubt helps to release the creative energies for athletes. Therefore, 7 expressions were made candidate for the final scale phrases of global sport achievement.

- **- Interpretation of the fourth factor**

The fourth factor is composed of 10 phrases with the highest saturation according to the approved conditions for the interpretation. The significant value was (± 0.50) or more, and at a rate of (16.13%) of the total number of phrases. Their saturation ranges from 0.511 to 0.733. This factor 7.117% was explained of the total variance.

The analysis of the phrases of this factor indicates that it is fluency. Thus it is called (**thinking fluency)**. This result is consistent with (Arora, 2002: 125) idea that thinking fluency is the ability to express new connected ideas in a short period of time when facing sport challenge. It is the ability to quickly and easily generate many alternatives, parallels ideas, problems or uses when responding to a specific issue. In essence, it is an optional memorization and study process for information, experience or concepts which the athlete learned before Therefore, 7 phrases were made candidate for the final scale expressions (Jarwan, 2008:84). It is an athlete professional situation when all components are united (muscle, brain, and mobility fluency) and there is a smooth flow in the skill performance in the best ways. Thus 10 phrases were candidates for the final scale..

- **-The interpretation of fifth factor**

According to the approved conditions for the interpretation, the fifth factor compose 6 phrases with the highest saturation. The significant value was (± 0.50) or more, and at a rate of (9.68%) of the total number of expressions. Their saturation range is 0.581 - 0.809. It is 7.117% of the total variance.

When analyzed, the fifth factor appeared to be **(thinking style).** This result confirms Al-(Hasso, 2010: 107) idea that thinking style plays a key role in the performance of the player during the competition as there is an operation room in the mind of the player which enables him/her to think and behave correctly with high accuracy and confidence. The style of thinking gives the player the ability to understand many situations in competition and analyze them, producing a creative response. Its accuracy depends on past or acquired experience by mental preparations and the way of thinking in the stadium. That happens in (parts of) seconds. This means that the player can evaluate the emergent situation in the sport competition in a high speed if various styles of thinking and constant wills are present and complete. Thus, 6 expressions are competing for the final scale expressions.

- **-The interpretation of the sixth factor**

In compliance with approved conditions for the interpretation, the sixth factor compose 6 expressions with the highest saturation. The significant value was (± 0.50) or more, and at a rate of (16.13%) of all expressions (62) which are subject to global analysis. Their saturation range is 0.581 - 0.809. It is 5.42% of the total variance.

The investigation of the sixth factor shows that it is **(synchronization)**. This result agrees with (Khudair, 2017: 149) who state that synchronization is the ability of the athlete to acclimatize and keep pace with the life criteria, sport environment and any duty instead of feeling excluded. Players with high synchronization are able to live with the highest levels of concentrations on personal issues and the surrounding environment and are able to cope with competition stress instead of losing concentration.

The ability of the players to control themselves, hide negative feeling and convert them into positive ones in the competition is in more synchronization with critical situations. Those players are able to face challenges and obstacles in the competitions. Therefore, the number of the candidate expressions are 10 for the final scale.

- **Excluded Factors**

Three factors (seventh, eighth and ninth) are excluded because they did not comply with the conditions to accept them. The factors are saturated by one factor or two. As a result, they were excluded as seen in table (15).

- **Final Scale**

Following the completion of the statistical analysis and the application of the basic conditions to accept the factors and interpreting them, six dimensions were the final. They represent the whole scale of the serious creativity scale of athletes applying for some team and individual games in Iraq. The final scale includes (52) expressions out of a total of (62) words as in table (16):

Table 16: the arrangement of the matrix of the final factors according to the order of the factors and their saturation after the factor analysis

ت	The dimensions	Phrase No.	1	2	3	4	5	6
1	Challenge	16Q	.735					
2		Q4	.651					
3		Q22	.625					
4		Q21	.622					
5		Q24	.602					
6		Q25	.587					
7		Q19	.561					
8		Q23	.523					
9		Q18	.518					
10		Q20	.511					
11	Mental motivation	5Q		.752				
12		Q6		.729				
13		Q9		.673				
14		Q3		.661				
15		Q7		.650				
16		Q12		.564				
17		Q11		.540				
18		Q2		.507				
19		Q13		.502				
20	Freedom	48Q			.713			
21		Q49			.581			
22		Q54			.551			

23		**Q51**			**.545**			
24		**Q50**			**.540**			
25		**Q55**			**.518**			
26		**Q53**			**. 504**			
27		**36Q**				**.733**		
28		**Q34**				**.729**		
29		**Q26**				**.718**		
30		**Q33**				**.705**		
31	**Thinking**	**Q27**				**.682**		
32	**fluency**	**Q28**				**.661**		
33		**Q32**				**.603**		
34		**Q31**				**.565**		
35		**Q35**				**.532**		
36		**Q29**				**.511**		
37		**60Q**					**.809**	
38		**Q62**					**.743**	
39	**Thinking**	**Q61**					**.732**	
40	**style**	**Q59**					**.726**	
41		**Q58**					**.637**	
42		**Q57**					**.581**	
43		**47Q**						**.759**
44		**Q37**						**.731**
45		**Q41**						**.705**
46		**Q45**						**.701**
47	**Coincidence**	**Q44**						**.688**
48		**Q40**						**.683**
49		**Q46**						**. 674**
50		**Q43**						**.641**
51		**Q38**						**.613**
52		**Q39**						**.569**

Conclusions

- The scale of creativity for athletes that was designed and built is able to diagnose what was set for it and can be used by applying it to similar samples.
- In light of the results, 6 dimensions were extracted for the scale of serious creativity of athletes. These dimensions can be measured individually. These dimensions are challenge (10 expressions), mental motivation (9 expressions), freedom, (7 expressions), (mental fluency 10 expressions), Thinking Style, (6 expressions) and Sync, 10 expressions).

- **Recommendations**

The study recommends the following:

-Adopting the scale athletes to measure the serious creativity of applicant players for national clubs and teams.

-Attaching importance to serious creativity and allocating time for training it, because of its great role in raising the athletic level.

-Carrying out similar studies using the serious creativity scale on different samples, or using different variables such as anxiety, psychological security, and self.

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Appendix

The final scale of serious creativity

ت	Expressions	Totally agree	Agree	Neutral	Disagree	Totally disagree	Dimen-sions
1	I face a strong competitor with high enthusiasm						Challenge
2	Training difficult duties motivates me to win competitions						
3	I exclude from my thinking defeat or failure to compete						
4	I look for a solution when I encounter unexpected difficulties during training or competition						
5	I challenge high-level competitors						
6	I face challenges without losing control of my emotions						
7	I rush to do well in the competition						
8	When I have a problem, I only use the solutions available to me						
9	I find more fun in competition than training						
10	I challenge the difficulties in achieving my goals						
11	I surprise the opponent by an unexpected performance during the competition						Mental motivation
12	I use new methods to fulfill my duties in training and competition						
13	Professional and unfamiliar performance does not interest me						
14	I am happy to do my duties very well						
15	I plan to learn new skills to apply them in competition						
16	My mind gets shattered very quickly during the competition						
17	I am proud when I am able to provide solution to face difficulties						
18	It's easy to concentrate when facing the rival						
19	I concentrate on skills that other do not have						

20	**I can develop my skills in relations with my thoughts**						**Freedom**
21	**I am affected by the surrounding environment when finding solutions**						
22	**Difficult situations help me to look for solutions**						
23	**There are restrictions that prevent me from performing well**						
24	**Create unfamiliar ideas in different situations**						
25	**I give my opinions and ideas in different situations**						
26	**I can overcome failure to achieve new success**						
27	**I do my duties without prioritizing them.**						**Thinking fluency**
28	**I am spontaneous in expressing my thoughts**						
29	**I successfully face sudden situations in training and competition**						
30	**I offer deep spontaneous ideas to solve problems and improve performance**						
31	**It is difficult to face new situations without planning them**						
32	**It takes a long time thinking to overcome my positions**						
33	**I actively find solutions to difficult problems and situations**						
34	**I can do several creative ideas or skills in a short time**						
35	**I can formulate ideas accurately and coherently**						
36	**I stick to my first idea to face different situations**						
37	**I prefer the most familiar way to solve problems**						**Thinking style**
38	**It is difficult to use the same idea during performance and in a new style**						
39	**I arrange my duties according to their importance when performing more than one task**						
40	**When I encounter a problem, I use new strategies to solve it**						
41	**I look for new ideas to improve my way of performing my duties**						
42	**I change the way I perform to discover opponent's weaknesses**						
43	**The opponent's change of plans increases my interest and creativity**						**synchronization**
44	**I believe in the principle of apathy in training and competition**						
45	**It is hard to change my personality cohere with the team**						
46	**I accept the coach's change of the playing plan in training or competition**						
47	**Sudden life changes increase my sports potential**						
48	**I easily understand what is going on in training and competition**						
49	**I have physical and skill capabilities that help me to continue**						
50	**I find creative solutions to face difficult situations**						
51	**The more important the competition, the higher my level of sports**						

52	**Surprising sports situations do not affect my enthusiasm to win**						