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Impact of the Distribution Ratio Properties in the Evaluation of the Technique Triple Jump Theoretical Technique

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Abstract: **The purposes of this study were to describe and compare the impact of biomechanics assessment in the development of the techniques in triple jump to allowing our coach. The importance of biomechanical principles in the evaluation of performance.**

In the lack of new technology Kinematic and kinetic analysis and the argument of Algerian coach to the objective assessment, our study based on exploring the literature and everything related to the subject of our research as a reference to answer the questions asked in this study:

•Are there differences in distribution properties phase ratio observed for our simple total, championships, and best performances?

•Which sentencing we can observe in this variance distribution of phases?

•Which amendment we can give an athlete to predicts a modality distribution of phases?

For that, we have choose the Analysis qualitative of variance and correlation of the distances achieve in each of the phases with the official distance of jumper, "T" and "f" ANOVA with LSD to compare implementation distribution of phases (hop, step and jump) with the results accuses.

Our aim for this research is to down on:

- **The importance of modern technology in assessing the performance of the athletes.**
- **The impact of biomechanics assessment in the development of the techniques triple jump.**
- **describe the importance of ratio phase to identify the mistakes used by athlete.**

Keywords: **the phase / modality of theoretical and practical technique / triple jump.**

I. INTRODUCTION

Who does not know that victory in the sport's world calculate in three options firstly, in the talent of the athlete, secondly in the intelligence of his coach, thirdly, in long hours of training. From this analysis:

We refer to the Algerian coach that the decline Algerian Champions in the World Championships and the continental is primarily explain in acquiring with recording techniques and biomechanical analysis, (Abeer Eissa, 2014) allows the possibility to generate information about techniques, adapting the technique to the optimum model, depending on the somatic and motor particularities of athletes (IAAF, 2005)".

That we interpret in the aims of nations dominating the results sportive which lies in the development of measurement technology and the solving in the problems of training with the discovery of the techniques that have contributed to improve the technique for the measurement of mechanical variables, anthropometric variables, anatomical and physiological. (Clifford Larkins)The biomechanics is one of this measurement technology science that analyses the movement in real time. It represents an essential instrument in the monitoring of the sportive techniques. Those data are

assumed by existence of an operational system that whom the figure data recorded by software technologies, in order to be processed, interpreted and used to describe an exact technical aspects which allows the coaches to sentence and amendment the evaluation performance in the plan career of athletes.. [C.j. payton & r.m, bartlett 2008].

Kinematics is one of sectors in studies biomechanics the geometrically, spatial and temporally description of the movement by the framework of the following parameters: time, position, and trajectory, angles, and linear velocity, linear acceleration, angular velocity, angular acceleration. The assessment of this analyses is supposed to use these parameters in order to obtain some objective information, concerning the technique elements and proceedings, as well as the base mechanism, specific two some sportive discipline or event." [I, Mihai, 2009].

Our objectives in this study arise from the impact of biomechanical analyzes variations in triple jump, which is based on an analysis with valuable practical relevance for training on the assessment of the following parameters that (Brueggemann and Avampatzis, 1997) mentions in his report. Which we consider the aims of this study:

•Classify the performances according to the dominance of distributions applied in phases observed in the reports.

•Compare the impact of the modality practice by athlete on dominate techniques observed in reports to success.

•Comparing the differences and progress techniques practices by our champions to overcome the bar of the 18 meters.

Our intervention in this research based from a prospective study that we have questioned some coaches triple jump in Algeria for aims to identify the tools used in the analysis of the results of their athletes as programs reveal mistakes performance and achieve the goals in the plan training. We recorded the adoption of the coaches in the total distance as an indicator evaluation, without addressing to reveal contribution of the theoretical model practice by athletes, in the absence of measurement technologies.

The problematic of this study stems from the reality of the application of the contestants for the theoretical distribution models. where we recorded the example of TEDDY TAMGHO Champion 2013 World in his first trial with modality distribution theoretical hop dominant (35% 31% 33%) realis 17,65 m, in occurrence his title in the same competition for the world champion is in the basis of a distribution (34% 29% 37%) theoretically the technical basis domination jump.

This difference led us to study the impact of modality ratio phases on the representations of phases and performance dominate in objective analysis (Hay, 2002).we have chosen the qualitative analysis, which is inexpensive and one of the best way in the study of motion. She allows considering of all the variables affecting the movement with the registration of all sections of the movement to be present to the coach and athlete, for facilitating the process of the evaluation performance and identifying the strengths and weaknesses in the required case. (Qassim Hassan Hussein, 1998)

II. BODY OF ARTICLE

1. Research methods:

Explore the literature on everything related to the subject of our research.

Follow-up the reports, quantitative analysis of our simple

Follow-up the reports, qualitative in similar studies

Follow-up biomechanical analysis using in the similar studies

Follow-up statistical analysis using in the similar studies.

2. Subjects:

Three world champions 2009 (project by the german atletecs federration, 2009)

Name / Att.	Jump distance [m]			Stride length [m]			relative dist. [%]		
	Off.	real	loss	Hop	Step	Jump	Hop	Step	Jump
Idowu P. 3rd	17.73	17.92	0.19	6.49	5.41	6.02	36	30	34
Evora N. 6th	17.55	17.60	0.05	6.51	5.41	5.68	37	31	32

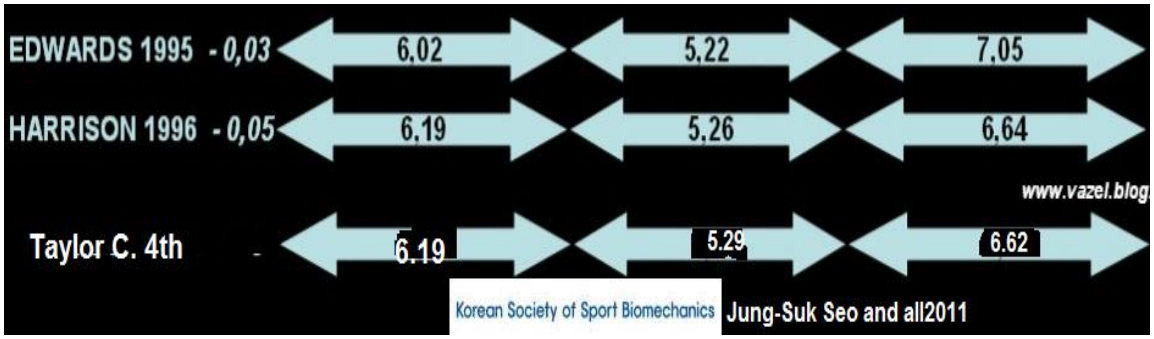
Copello A. 6th	**17.36**	**17.54**	**0.18**	**6.01**	**5.77**	**5.92**	**34**	**33**	**33**
Sands L. 5th	**17.32**	**17.34**	**0.02**	**6.52**	**5.20**	**5.62**	**38**	**30**	**32**
Girat A. 1st	**17.26**	**17.39**	**0.00**	**6.16**	**5.41**	**5.88**	**35**	**31**	**34**
Li Y.4th	**17.23**	**17.32**	**0.09**	**6.33**	**5.24**	**5.75**	**37**	**30**	**33**
Spasovkhodskiy I.	**16.91**	**16.96**	**0.05**	**6.47**	**4.80**	**5.69**	**38**	**28**	**34**
Gregorio J. 2nd	**16.89**	**17.15**	**0.26**	**6.33**	**5.10**	**5.72**	**37**	**30**	**33**

Three world champions 20011 (IAAF, 2013)

Name / Attempt	Jump distance (m)			Stride length (m)				
	off.	real	loss	2L	1L	Hop	Step	Jump
Taylor C. 4th	17.96	18.10	0.14	2.40	2.37	6.19	5.29	6.62
Idowu P. 4th	17.77	17.77	0.14	2.52	2.24	6.67	5.64	5.60
Claye W. 3rd	17.50	17.67	0.17	2.42	2.31	5.77	5.43	6.47
Name / Attempt	Relative distance (%)			Horizontal velocity (m/s)				
	Hop	Step	Jump	2L	1L	Hop	Step	Jump
Taylor C. 4th	34	29	37	10.25	10.57	9.70	8.61	7.33
Idowu P. 4th	37	32	31	10.36	10.62	9.65	8.11	6.53
Claye W. 3rd	33	31	36	10.08	10.27	9.77	8.57	7.33

Name / Attempt	Loss of horizontal velocity (m/s)			Vertical velocity (m/s)			Angle of take-off (°)		
	Hop	Step	Jump	Hop	Step	Jump	Hop	Step	Jump
Taylor C. 4th	0.87	1.09	1.28	1.78	1.92	2.43	10.3	12.6	18.3
Idowu P. 4th	0.97	1.54	1.58	2.15	2.05	2.6	12.6	14.3	21.8
Claye W. 3rd	0.50	1.20	1.24	1.85	1.99	2.76	10.7	13.1	20.8

Three best records world champions



3. Hypothesis:

The world Championships practice three-distribution techniques with two dominants technique.

Which sentencing we can observe in this variance a) In the distribution ratios b) between the distribution ratios and difference phase distances.

Which amendment we can give to the athlete in assessment the errors in combined distribution.

4. Results and Discussion:

The world Championships practice three-distribution techniques with two dominants.

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Table 1 shows the sample search results:

(a) For World Championship participants 2009.

Name / Attempt	Jump distance (m)		relative dist. [%]			Dominant techniques	percentage	%
	real	loss	Hop	Step	Jump	(Hay, 1992)		
Idowu P. 3rd	17.92	0.19	36	30	34	Hop-dominated technique	0/Jump-dominated technique	0
Evora N. 6th	17.60	0.05	37	31	32	Hop-dominated technique	7/Hop-dominated technique	87.5
Copello A. 6th	17.54	0.18	34	33	33	Balanced technique		
Sands L. 5th	17.34	0.02	38	30	32	Hop-dominated technique		
Girat A. 1st	17.39	0.00	35	31	34	Hop-dominated technique	1/ Balanced technique	12.5
Li Y.4th	17.32	0.09	37	30	33	Hop-dominated technique		
Spasovkhodskiy I. 2nd	16.96	0.05	38	28	34	Hop-dominated technique		
Gregorio J. 2nd	17.15	0.26	37	30	33	Hop-dominated technique		
M	17.40	0.11	36.50	30.38	33.13	SUM	8	simple %
SD	0.29	0.09	1.41	1.41	0.83	percentage	%	100%

(b)FOR World Championship participants 2011

Name / Attempt	Jump distance (m)			relative dist. [%]		Dominant techniques	percentage	%
	real	loss	Hop	Step	Jump	(Hay, 1992)		
Taylor C. 4th	18.10	0.14	34	29	37	Jump-dominated technique	2 Jump-dominated technique	25
Idowu P. 4th	17.77	0.14	38	32	32	Hop-dominated technique	6 Hop-dominated	75
Claye W. 3rd	17.67	0.17	33	31	37	Jump-dominated technique		
Copello A. 5th	17.62	0.15	36	31	33	Hop-dominated technique		
Evora N. 1st	17.46	0.11	37	30	33	Hop-dominated technique	0/ Balanced technique	0
Olsson C. 1st	17.45	0.22	37	29	34	Hop-dominated technique		
Sandsa L. 5th	17.59	0.38	38	27	35	Hop-dominated technique		
Compaore B. 3rd	17.48	0.31	36	30	34	Hop-dominated technique		
M	17.64	0.20	35.99	29.76	34.34	SUM	8	simple%
SD	0.22	0.10	1.72	1.37	1.74	percentage	%	100%

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(c) FOR best means on triple jumpers

Name / Attempt	Jump distance (m)		relative dist. [%]			Dominant techniques	percentage	%
	real	loss	Hop	Step	Jump	(Hay, 1992)		
JONATHAN EDWARDS	18.29	0.03	33	29	39	Hop-dominated technique	0	0%
KENNY HARRISON	18.09	0.05	34	29	37	Jump-dominated technique	4	100%
TEDDY TAMGHO	18.04	0.06	34	29	36			
Taylor C. 4th	18.1	0.14	34	29	37	Balanced technique	0	0%
M	18.16	0.07	33.87	29.06	37.08	SUM	4	100%
SD	9.08	0.05	0.64	0.37	0.98	%	100/100	

From the table 1(a-b-c) through the results, the percentage is in favor Hop-dominated technique for the World Championship participants 2009 and 2011 in addition the best, world triple jumpers and world record in 2011 is in favor the Jump-dominated technique.

Conclusion and Discussion Hypothesis1:

Through the results of our simples. Based on those results we can judge the variation observed in the reports as optimum phase ratio is different from athlete to adder. (Bing Yu, PhD, 1982)Three commonly used triple jump techniques in terms of phase ratio (Hay, 1992)

Hop-dominated technique (High hop)

Jump-dominated technique (Flat hop)

Balanced technique

Table 2 (a) variance mean dominated technique of the best results in triple jumper's phases

simple	Jump distance (m)			Stride length		relative dist. [%]			
Hop-dominated technique mean with step phase ratio30%									
Name / Att.	Off.	real	loss	Hop	Step	Jump	Hop	Step	Jump
Evora N. 1st	17.35	17.46	0.11	6.44	5.18	5.84	37	30	33
Compaore B. 3rd	17.17	17.48	0.31	6.32	5.23	5.93	36	30	34
Idowu P. 3rd	17.73	17.92	0.19	6.49	5.41	6.02	36	30	34
Li Y.4th	17.23	17.32	0.09	6.33	5.24	5.75	37	30	33
M	17.37	17.545	0.175	6.395	5.265	5.885	37	30	34
SD	0.25	0.26	0.10	0.08	0.10	0.12	0.58	0.05	0.58
hop-dominated technique mean with step phase ratio31%									
	Off.	real	loss	Hop	Step	Jump	Hop	Step	Jump
Copello A. 5th	17.47	17.62	0.15	6.40	5.38	5.84	36.32	31	33.14
Evora N. 6th	17.55	17.60	0.05	6.51	5.41	5.68	37.00	31	32.00
Girat A. 1st	17.26	17.39	0.00	6.16	5.41	5.88	35.00	31	34.00
TEDDY TAMGHO	17.65	17.65	0.01	6.23	5.54	5.88	35.30	31	33.31
M	17.48	17.54	0.07	6.33	5.44	5.82	35.90	31	33.11
SD	0.17	0.13	0.08	0.16	0.07	0.10	0.92	0.35	0.83
Jump-dominated technique mean with step phase ratio29%									
	Off.	real	loss	Hop	Step	Jump	Hop	Step	Jump
JONATHAN EDWARDS	18.29	18.29	0.03	6.02	5.22	7.05	33.00	29	39.00
KENNY HARRISON	18.09	18.09	0.05	6.19	5.26	6.64	34.00	29	37.00
TEDDY TAMGHO	18.04	18.04	0.06	6.16	5.30	6.58	34.00	29	36.00
Taylor C. 4th	18.10	18.10	0.14	6.19	5.29	6.62	34.00	29	37.00
M	18.13	18.16	0.07	6.14	5.27	6.72	33.87	29	37.08
SD	0.11	9.08	0.05	0.08	0.04	0.22	0.64	0.37	0.98

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TABLE2(b) THE Correlations

		hop	step	jump
hop	**Pearson Correlation**	**1**	**.031**	**-.791****
	Sig. (2-tailed)		**.923**	**.002**
	N	**12**	**12**	**12**
step	**Pearson Correlation**	**.031**	**1**	**-.280**
	Sig. (2-tailed)	**.923**		**.378**
	N	**12**	**12**	**12**
jump	**Pearson Correlation**	**-.791****	**-.280**	**1**
	Sig. (2-tailed)	**.002**	**.378**	
	N	**12**	**12**	**12**

**. Correlation is significant at the 0.01 level (2-tailed).

Through the results in Table2 (a-b) and the objectives of the research we have divided, the sample on based theoretical dominated technique

From Table 1(a) and the relationship connectivity within Table 1(b) shows:

That Hop-dominated technique mean with step phase ratio 30 % application is for the benefit of Idowu P. 3rd (36%30%34%), Any increase in the hop phase 1% and minus 1% in the jump phase adversely affect the final distance. Conversely, any increase to 1% in the jump phase and incompleteness in the hop phase contributes to the emergence of balance modeling.

That Hop-dominated technique mean with step phase ratio 31 % application is for the benefit of Teddy Tamgho (35%31%33%), any increase in the hop phase 1% it supports the result of the right choice of model dominated technique . Conversely, any increase to 1% in the jump phase and incompleteness in the hop phase contributes to the emergence of balance modeling.

That Jump-dominated technique mean with step phase ratio 29% application is for the benefit of JONATHAN EDWARDS (33%29%33%), any increase in the hop phase 1% it is not for the benefit of the result. The difficulty of applying the model due to is credible in the distribution, which it is not affected in modeling with other species.

Conclusion results table1and2:

Our simple practice two techniques dominant (hop and jump) that (Hay, 1992) explain in Effort distribution decides jumping techniques in different phases especially in the hop and step phases. This confirms the Problematic of the current study, in the impact effort distribution decides jumping in the choice dominated technique and his rapport with the variant of the ratios theoretical distribution credibility.

Based on Theoretical background and field applications Our Ask wondering pro:

The differences in the distribution can consider them as mistakes in the diversity of application of theoretical probability technique.

Which sentence can we rule in this variance feature dominated technique?

Which amendment can we give to the athlete in Rule assessment those errors in combined distribution?

1) Which sentencing can we rule in this variance feature dominated technique?

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Table 3 (a) Paired Samples Test between Hop-dominated technique with the step ratio (31%) and (30%).

Independent Samples Test

		Levine's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
HOP	Equal variances assumed	4.408	.081	.779	6	.466	.07000	.08991	-.15000	.29000
	Equal variances not assumed			.779	4.532	.475	.07000	.08991	-.16848	.30848
STEP	Equal variances assumed	.360	.571	-2.764	6	.033	-.17000	.06151	-.32051	-.01949
	Equal variances not assumed			-2.764	5.424	.036	-.17000	.06151	-.32447	-.01553
JUMP	Equal variances assumed	.306	.600	.865	6	.420	.06500	.07511	-.11879	.24879
	Equal variances not assumed			.865	5.777	.421	.06500	.07511	-.12052	.25052

Through the results in Table3, (a-b) T and the correlations are statistically no significant in all comparisons except in step ratio (31%) and (30%). Based on that result we emphasize the impact of the distribution ratio differentiating between the ratios theoretical distribution credibility and the two technique with difference ratio's phase step. Based in our results: we confirmed to (Hay, 1992) that the Effort distribution decides jumping techniques in different phases especially in the hop and step phases. On conversely the originality Choice on technique is affected by the increase in the jump phase, which is the result of the mistakes applied in the control of function velocity conversion coefficient and gains in the -hop phase (Bing Yu, PhD, 1982) inadvertently accomplish greater distance.

(b) Correlations

		HOP	STEP	JUMP
HOP	Pearson Correlation	1	-.231	-.163
	Sig. (2-tailed)		.583	.700
	N	8	8	8
STEP	Pearson Correlation	-.231	1	.116
	Sig. (2-tailed)	.583		.784
	N	8	8	8
JUMP	Pearson Correlation	-.163	.116	1
	Sig. (2-tailed)	.700	.784	
	N	8	8	8

Conclusion comparison 1 part (a):

The theoretical distribution technique is a theoretical possibility expresses total distance that vary from athlete to another and from the test to another, on this difference in a typical estimate is honest application of view objective descriptive evaluation Allowing the Coach and athlete to disclose the nature of distribution and reasons behind the decline in the results or progress. In a condition, the hop stage is the longest one in the practice of this technique.

Table3 (b) There are significant differences statistically between Hop-dominated technique with the step ratio (31%) and Jump-dominated technique with the step ratio (29%).

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Independent Samples Test

		Levine's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
HOP	Equal variances assumed	.179	.687	4.379	6	.005	.25500	.05824	.11250	.39750
	Equal variances not assumed			4.379	5.996	.005	.25500	.05824	.11247	.39753
STEP	Equal variances assumed	2.448	.169	-.047	6	.964	-.00250	.05321	-.13270	.12770
	Equal variances not assumed			-.047	3.760	.965	-.00250	.05321	-.15403	.14903
JUMP	Equal variances assumed	1.428	.277	-6.738	6	.001	-.83750	.12429	-1.14163	-.53337
	Equal variances not assumed			-6.738	4.556	.002	-.83750	.12429	-1.16660	-.50840

(b) Correlations

		HOP	STEP	JUMP
HOP	Pearson Correlation	1	.263	-.888**
	Sig. (2-tailed)		.529	.003
	N	8	8	8
STEP	Pearson Correlation	.263	1	.032
	Sig. (2-tailed)	.529		.939
	N	8	8	8
JUMP	Pearson Correlation	-.888**	.032	1
	Sig. (2-tailed)	.003	.939	
	N	8	8	8

Conclusion comparison 2 part (a):

The theoretical distribution technique is a theoretical possibility expresses total distance that vary from athlete to another and the test from another and from model to another on this difference in a typical estimate is honest application of view objective descriptive evaluation. Allowing the Coach and athlete to disclose the nature of distribution and reasons behind the decline in the results or progress. In a condition the hop or jump phase be the longest.

Table3 (c) There are significant differences statistically between Hop-dominated technique with the step ratio (30%) and Jump-dominated technique with the step ratio (29%).

(c) Independent Samples Test

		Levine's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
HOP	Equal variances assumed	4.230	.085	2.069	6	.084	.18500
	Equal variances not assumed			2.069	4.462	.100	.18500
STEP	Equal variances assumed	1.463	.272	4.190	6	.006	.16750
	Equal variances not assumed			4.190	4.428	.011	.16750
JUMP	Equal variances assumed	2.332	.178	-7.537	6	.000	-.90250
	Equal variances not assumed			-7.537	4.088	.002	-.90250

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Through the results in Table3, (c) T and correlations are statistically significant in all comparisons except in hop ratio. Based on that result we emphasize the modality of the distribution ratio dominant in the difference between the ratios theoretical distribution credibility and the two-different models.This confirmed the relationship, where we found a strong negative correlation between the two models (HOP and JUMP dominant) for the correlations step phase and jump phase is statistically significant a strong negative .

(c) Correlations

		HOP	STEP	JUMP
HOP	Pearson Correlation	1	.490	-.782*
	Sig. (2-tailed)		.218	.022
	N	8	8	8
STEP	Pearson Correlation	.490	1	-.861**
	Sig. (2-tailed)	.218		.006
	N	8	8	8
JUMP	Pearson Correlation	-.782*	-.861**	1
	Sig. (2-tailed)	.022	.006	
	N	8	8	8

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Conclusion comparison 3 part (a):

The theoretical distribution technique is a theoretical possibility expresses total distance that vary from athlete to another and from the test to another and from model to another, on this difference in a typical estimate is honest application of view objective descriptive evaluation. Allowing the Coach and athlete to Disclose the nature of distribution and reasons behind the decline in the results or progress. In condition of modality of the step, phase more percentage hop-dominated technique minus percentage Jump-dominated technique Conclusion and Discussion Hypothesis 2 part (a) which sentencing we can observe in this variance in the distribution ratios.

That means arranged to Algerian coaches, our finding confirm the importance of distribution models in evaluation of the practice technique, because they offer the means to detect the errors practices. (ALLEN, S.J., KING, M.A. and YEADON, M.R., 2013) Confirms the described of the techniques used by elite triple jumpers consist the determine characteristics were significantly related to the officially recorded distance of the jump. (Bing Yu, PhD, 1982) Confirmed Maximum error in stride length can be used to determine which strides are the major contributors to maximum error in toe-board distance. Our study confirm reliance on hop distance rule and conviction to get the most distance in training period contributes to the mistakes revealed by the athlete in adjustment distances between phases on the basis of this discussion we ask:

Which sentencing can we referee in difference phase distances?

•Which sentencing we can referee between the distribution ratios and difference phase distances.

Table 3 (a) ANOVA

				Sum of Squares	df	Mean Square	F	Sig.
Hop-Step	Between Groups	(Combined)		.166	2	.083	4.881	.037
		Linear Term	Contrast	.133	1	.133	7.817	.021
			Deviation	.033	1	.033	1.946	.197
	Within Groups			.153	9	.017		
	Total			.318	11			
Hop-Step	Between Groups	(Combined)		2.530	2	1.265	47.276	.000
		Linear Term	Contrast	1.394	1	1.394	52.118	.000
			Deviation	1.135	1	1.135	42.434	.000
	Within Groups			.241	9	.027		
	Total			2.771	11			

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Table3 (b) Multiple Comparisons
LSD

Dependent Variable	(I) simple	(J) simple	Mean Difference (I-J)	Std. Error	Sig.
Hop-Step	Hop-dominated technique With step phase ratio30%	hop-dominated technique With step phase ratio31%	.24000*	.09210	.028
		Jump-dominated technique With step phase ratio29%	.25750*	.09210	.021
	hop-dominated technique With step phase ratio31%	hop-dominated technique With step phase ratio30%	-.24000*	.09210	.028
		Jump-dominated technique With step phase ratio29%	.01750	.09210	.854
	Jump-dominated technique With step phase ratio29%	hop-dominated technique With step phase ratio30%	-.25750*	.09210	.021
		hop-dominated technique With step phase ratio31%	-.01750	.09210	.854
Jump-Step	Hop-dominated technique With step phase ratio30%	hop-dominated technique With step phase ratio31%	.23500	.11566	.073
		Jump-dominated technique With step phase ratio29%	-.83500*	.11566	.000
	hop-dominated technique With step phase ratio31%	hop-dominated technique With step phase ratio30%	-.23500	.11566	.073
		Jump-dominated technique With step phase ratio29%	-1.07000*	.11566	.000
	Jump-dominated technique With step phase ratio29%	hop-dominated technique With step phase ratio30%	.83500*	.11566	.000
		hop-dominated technique With step phase ratio31%	1.07000*	.11566	.000

***. The mean difference is significant at the 0.05 level.**

From the table 3(a-b): through the results, show that the variances of phase's distance for this we calculated the difference between the distance hop and step and jump distance and step anova on one way is significant in all comparison, In order to arrange the groups we calculated LSD

Conclusion:

1. In difference between Hop-Step, we notice:

All differences are in favor of hop Hop-dominated technique with step phase ratio30 %

No statistically significant differences in other comparison

2.In difference between jump-Step we notice:

All differences are in favor of jump-dominated technique with step phase ratio29 %

No statistically significant differences in other comparison.

Conclusion and Discussion Hypothesis 2 part (b) which sentencing we can referee between the distribution ratios and difference phase distances:

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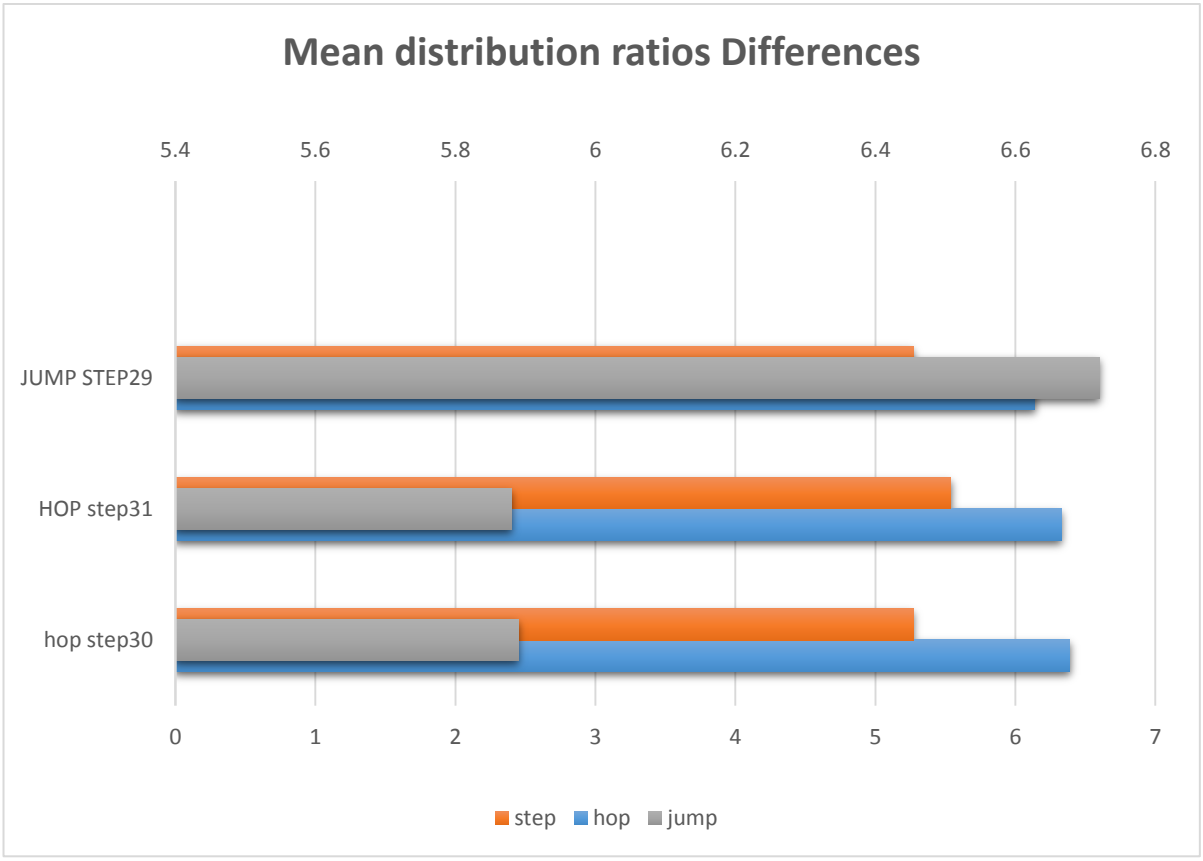
In order to clarify the nature of the distribution relationship differences in distance between the step phase and other phases shown in Figure1



Through results presented and based on the question, the researchers confirm that the difference distances between stages is not only to reveal the nature of the distribution, but also for the implementation of the Strategic Competitor index

• Which amendment we can give to the athlete in assessment the errors in combined distribution.

Table4(A) ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
hop	Between Groups	.189	2	.094	7.277	.013
	Within Groups	.117	9	.013		
	Total	.306	11			
step	Between Groups	.080	2	.040	6.878	.015
	Within Groups	.052	9	.006		
	Total	.132	11			
jump	Between Groups	2.203	2	1.101	38.603	.000
	Within Groups	.257	9	.029		
	Total	2.459	11			

From the table 3 through the results, the Anova is significant at the 0.05 levels For the benefit of! This brings us to calculate LSD

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Table4(B) Multiple Comparisons LSD

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.
Phase hop	Hop-dominated technique With step phase ratio30%	hop-dominated technique With step phase ratio31%	0.12	0.08	0.17
		Jump-dominated technique With step phase ratio29%	.30500*	0.08	0.00
	hop-dominated technique With step phase ratio31%	hop-dominated technique With step phase ratio30%	-0.12	0.08	0.17
		Jump-dominated technique With step phase ratio29%	.18500*	0.08	0.05
	Jump-dominated technique With step phase ratio29%	hop-dominated technique With step phase ratio30%	-.30500*	0.08	0.00
		hop-dominated technique With step phase ratio31%	-.18500*	0.08	0.05
Phase step	Hop-dominated technique With step phase ratio30%	hop-dominated technique With step phase ratio31%	-.17750*	0.05	0.01
		Jump-dominated technique With step phase ratio29%	-0.01	0.05	0.86
	hop-dominated technique With step phase ratio31%	hop-dominated technique With step phase ratio30%	.17750*	0.05	0.01
		Jump-dominated technique With step phase ratio29%	.16750*	0.05	0.01
	Jump-dominated technique With step phase ratio29%	hop-dominated technique With step phase ratio30%	0.01	0.05	0.86
		hop-dominated technique With step phase ratio31%	-.16750*	0.05	0.01
Phase jump	Hop-dominated technique With step phase ratio30%	hop-dominated technique With step phase ratio31%	-0.01	0.12	0.92
		Jump-dominated technique With step phase ratio29%	-.91500*	0.12	0.00
	hop-dominated technique With step phase ratio31%	hop-dominated technique With step phase ratio30%	0.01	0.12	0.92
		Jump-dominated technique With step phase ratio29%	-.90250*	0.12	0.00
	Jump-dominated technique With step phase ratio29%	hop-dominated technique With step phase ratio30%	.91500*	0.12	0.00
		hop-dominated technique With step phase ratio31%	.90250*	0.12	0.00

*. The mean difference is significant at the 0.05 level.

From the table 3 through the results, *. The mean difference is significant at the 0.05 level.

In Hop phase, we notice:

- Major of the difference are in the benefit of Hop-dominated technique (30%) followed by Hop -dominated technique with step phase ratio 31% in last Jump-dominated technique with step phase ratio 29%. Between Hop-dominated technique (step phase ratio 30%) * Hop -dominated technique (step phase ratio 31%) no. significate at the 0.05 level.

- In step phase, we notice the difference:

It is for the benefit of Hop -dominated technique (step phase ratio 31%) followed by Jump-dominated technique with step phase ratio 29% in last Hop-dominated technique with step phase ratio 30%

Between Hop-dominated technique (step phase ratio30%)* Jump-dominated technique (step phase ratio29%) no significate at the 0.05 level

- In Jump phase, we notice the difference :

It is for the benefit of Jump-dominated technique with step phase ratio 29% followed by Jump-dominated technique with step phase ratio 31% in last Hop-dominated technique with step phase ratio 30%

Between Hop-dominated technique (step phase ratio30%)* Hop -dominated technique (step phase ratio31%) no significate at the 0.05 level

- **Conclusion and Discussion Hypothesis3 which amendment we can give to the athlete in assessment the errors in combined distribution**

The application of theoretical technique does not depend on the total distance in appreciation-dominated technique, rather to discuss the importance of each phase and those properties to extract the value of ratio phase. Based on this, the researchers confirm that the conflict within the output phase values are applied mistakes explained by (Hay, 1992): that the Effort distribution decides jumping techniques in different phases especially in the hop and step phases. On conversely the originality Choice on model is affected by the increase in the jump phase, which is the result of the mistakes applied in the control of function velocity conversion coefficient and gains in the -hop phase (Bing Yu, PhD, 1982) inadvertently accomplish greater distance.

III. CONCLUSION

The techniques used by elite triple jumpers have received considerable attention from biomechanics in the last decade. Biomechanical Studies have been conducted to identify those factors affecting the performance of the triple jump in an attempt to determine the optimum techniques for individual athletes (Bing Yu, PhD, 1982).

The contribution that each phase makes (or should make) to the total distance of a triple jump has been the subject of extended debate over the years (ALLEN, S.J., KING, M.A. and YEADON, M.R., 2013). Much of this debate has been concerned with the relative merits of the two most common techniques. (Clifford Larkins) said as can be seen from the findings listed from the similar studies, the mean contribution of the phase distances varied with each study. Hay's and Miller's (1985). **Our purposes of this study were:**

1. Our simple practice two techniques dominant (hop and jump) to archives results: Russian technique (which emphasizes the hop phase) and the Polish technique (which emphasizes the jump phase). (McNab, 1968)

2. Two percent as a theoretical means of distribution difference between the two techniques Increment errors practical theoretical models.

3. Phase ratios is good index detector of perfect distribution phase because it demonstrates the good practice model.

4. The differences distance between phase step and other phases (hop-jump) is good index detector applied mistakes explained

5. Exchange between the two models hop-dominated technique with step phase ratio 30% and hop -dominated technique with step phase ratio 31% as mistakes Applied hurt in the interests of final distance.

6. Exchange between the two models hop-dominated technique with step phase ratio 30% and Jump-dominated technique with step phase ratio 29% as mistakes applied it is not in favor of the total distance.

7. Exchange between the two models hop-dominated technique with step phase ratio 31% and Jump-dominated technique with step phase ratio 29% as mistakes applied it is in favor of the total distance.

8. Choose the closest to jump technique is the hop -dominated technique with step phase ratio 31%.

9. Application Jump-dominated technique with step phase ratio 29% is the most difficult distribution.

10. The control of the characteristics kinematics with all those advantages in phase-hop is in the interest of the model hop (step phase 31%) has been hop-dominated technique with step phase ratio 30%.

11. Optimum phase ratio is a repaired to find the right combing distribution phases for each choice technique practice by athlete.

These results are consistent with (Bing Yu, PhD, 1982) which confirms:

•There is not a single optimum phase ratio for all triple jumpers

•Optimum phase ratio is different from athlete to athlete

•Velocity conversion coefficient is the determinant of optimum phase ratio

In The end of these answers, we raise this question to the specialists to provide more details.

Our aim or our recommendation:

For our thematic:

1. Study the impact of relations of phase's modality that is the result of phase-hop, and organize jumping phase of appropriate scientific basis to the possibilities of the results of championships.

2. Study the problem posed in similar studies.

3. Take advantage of the study in the assessment and training triple jump.

For the interest in our laboratory Sports Institute:

1. The importance of modern technology in assessing the performance of the athletes.

2. The impact of biomechanics assessment in the development of the techniques triple jump.

3. The importance of distribution models theory in the modality of suitable choice technique practice by athlete.

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