

Analysis of some variable kinematical to triple jump world champions for the world championships in 2013

ZINAH ABDUL SALAM ABDUL RAZZAQ ✉, SHATHA ALI MUTASHAR, AYADABDAL RAHMAN AL SHAMMARI

College of Physical Education and Sport Sciences for Women, University of Baghdad, Iraq

ABSTRACT

To achieve the completion of any athlete requires knowledge and mechanical factors impacts on it and the lack of achievement is due to the neglect of some important parameters in athletic training specialist. This achievement is the process of the most adverse factors related the sports training. Motor analysis is utilized to evaluate the performance actions level and mathematical skills while players exactly, and in which you can find the mount of variables kinematical and evaluated via parameters kinematical model to sense the strengths and weaknesses in the player's performance in comparison to players, which assist in improving this performance. The contest triple jump competitions force fast they require a great deal of power mixed with speed also requires the control of an integrated performance requirements of physical and skill and also requires a high speed when you approach with a balance of high and balanced force for the feet together and are similar to the effectiveness of the long jump. **Keywords:** Jump; Champion; Kinematic analysis; Exercise.

Cite this article as:

Razzaq, Z.A.S.A, Mutashar, S.A., & Al Shammari, A.R. (2019). Analysis of some variable kinematical to triple jump world champions for the world championships in 2013. *Journal of Human Sport and Exercise*, 14(4proc), S450-S457. doi:<https://doi.org/10.14198/jhse.2019.14.Proc4.03>

✉ **Corresponding author.** College of Physical Education and Sport Sciences for Women, University of Baghdad, Iraq.

E-mail: zena@copew.uobghdad.edu.iq

Supplementary Issue: Spring Conferences of Sports Science. First International Conference in Iraq on Sport for Peace, 4 April 2019. Baghdad Science Institute, Baghdad, Iraq.

JOURNAL OF HUMAN SPORT & EXERCISE ISSN 1988-5202

© Faculty of Education. University of Alicante

doi:10.14198/jhse.2019.14.Proc4.03

INTRODUCTION

There are many factors that cause a significant impact, which manifested itself by observing the researcher of the achievements of the Global Note that there are differences in the levels of achievement with the players triple jump men because of the link age between these variable under study and the difference between the specification of physical and performance, and this reason is the omission of some of the trainers for the training-related side physical, technical and lack of adequate attention to the analysis motor for the players felt the researcher that the study of correlation and the percentage contribution of some variables kinematical and completion of the World men's Championship (2013) and for the driver the most important is horizontal speed to be a model a good model of dynamic global and knowledge of the strengths and weaknesses have interest in studying the contribution of the last step to run it closer modern equipment in the kinetic analysis to determine the strengths and weaknesses.

RESEARCH OBJECTIVES

- Identify some variables kinematical for the world champions in 2013 triple jump and its impact on achievement.
- Identify the correlations of the variables kinematics to the heroes of the world to some of the variables under study and the percentage of their contributions to the achievement.

THEORY

There is a clear difference in some of the parameters in the current study of the efficiency of the triple jump, and their impact on achievement.

1-4: Find the areas of:

1. The human sphere: Eight of the triple jump world champions.
2. Temporal area: 2013
3. Spatial domain: Moscow. Doha Shanghai (China)

RESEARCH METHODOLOGY AND PROCEDURES OF THE FIELD

Hypothesis

We employed the descriptive approach to solve the research problem.

Sample

it elected in the behaviour they are intentional (Karayan, 1987) of the heroes of the world men who got the first rank in the triple jump and race the best attempts by each player were analysed for the variables under study for the Championship in Athletics.

Collecting Methods

The methods of collecting data:- international research papers and books.

VIEW, ANALYZE AND DISCUSS THE RESULTS

Results were obtained for some variables kinematical research their relationship to real achievement to world champions triple jump were processed these data and correlations between them and the percentage of contribution and the causes of the presence and absence of these links because they represent global elite of the event. And the fact that the speed and angles of upgrading the main factor and the most important has been study variables improve the speed and angles of the three basic stages (hopscoth and step and jump) were obtained on this data to the World Championships in South Korea2011.

Table. Represents the correlation between distance delivery and horizontal speed of the pen ultimate step

Variables	Average	SD	Correlation	Tabular value	Contribution ratio	Moral Correlation
Distance	17,37	0,26	0,43	0,42	18%	moral
Horizontal speed of the penultimate step	10,1	0,22				

Through Table(1) the correlation and significance of moral and value of (0.43) and below the level of significance (0.05) is greater than the tabular value of (0.42) as well as significant or relation was greater than the tabular value is achieved through the link moral between both variables noted research earth at this relationship is the moral to link these two variables were not very highland most of the players, despite the fact they represent the global elite did not meet the interest of mechanical speed horizontal in the last two steps and reliable projectile to obtain the best achievement and it is producing more cases of during the braking process or reduce the horizontal speed to prepare for the process of upgrading and this constitutes an important point in the distance effect on achievement (Abdel-Al, 2006).

Table 2. Represents the relationship between distance and the complete truth to the horizontal speed of the last step

Variables	Average	SD	Correlation	Tabular value	Contribution ratio	Moral Correlation
Distance	17,37	0,26	0,51	0,42	26%	moral
Horizontal speed of the last step	10,11	0,18				

Through the Table (2) note that the correlation between two variables under study were (0.51) is greater than the tabular value This shows the players made the situation mechanic correct in linking variables of horizontal speed of the final step, despite the decline in the horizontal speed of the final step, which accounted for their contribution ratio (26%), however, did not have the braking high but there was a performance motor well in the binding process between the speed of the last step, which often less than the step before. When put jump foot on the panel upgrade at the end approaching, the centre of gravity is lower by about (Mardan & Abdul-Rahman, 2011;Karim fadhly,1997;Hassan Hussein, 2000) centimetres from the level of centre of gravity in the steps leading up to the take-off, which works to reduce the bending at the knee of a man rising and the recycling forward, leading to the advancement of good with very little loss of time spent on upgrading the moment (IAAF, 1993) formed a hopscoth ratio (35%) of the distance obtained by the fact that the contestants medium my account and standard deviation (Mardan & Abdul-Rahman, 2011).

Table 3. Represents the correlation between real distance delivery and horizontal speed of the Hop

Variables	Average	SD	Correlation	Tabular value	Contribution ratio	Moral Correlation
Distance	17,37	0,26	0,57	0,42	32%	moral
Horizontal speed of the Hop	9,25	0,17				

From Table(3) was significant correlation of (0.57) is greater than the tabular value of (0.42) and are clear up to weakness and this means that the situation jump use mechanical link between the right of the horizontal speed and the speed of partridge, using horizontal speed gained from approaching (Bullard,1979).To the moment of hopscotch is estimated at about (9.8 to 10.1) m / s towards the movement and uses a vertical velocity of (2,4 m/ s) and destined for the bottom of the attractions with the values of the ground and then decreasing the speed of up to (8.6 m/ s) toward the movement as well. As for the reason that there is no fixed rates for the stages of the triple jump (Partridge and move and jump) because of differences due to differences in the variables and physical jumpers and performance (James Hay,1988).

Table 4. Find the correlation high between the horizontal speed of the last step . Horizontal speed after last step

Variables	Average	SD	Correlation	Tabular value	Contribution ratio	Moral Correlation
Horizontal speed of last step	8,27	0,13	0,95	0,42	90%	Moral
Horizontal speed of after last step	10,1	0,22				

Through table No. (4), we find the correlation high between the horizontal speed of the last step . horizontal speed after last step it close, which was (0.95) and the level of significance (0.05) as well as significant correlation is very high compared to mainly tabular and this is clear evidence that the speed lost in step the last few, and by its contribution to high-formed (90%) and that this sample of high-level have taken the situation the mechanical quality of the phase leading up to the stage of upgrading is the stage of flight in the last step of the run it approach and reflected the importance of rhythm dynamic of two steps last two years to maintain the speed necessary to act the achievement of the right without decreasing the speed or delay in (Abdel-Rahman,2006) which the a little speed loss in the last step, impacts effectively on the performance of a proper stride length, since after the upgrade I happen landing velocity of the horizontal steps of the move and jump, then coach recommended to their players to not concentrate on a certain step of the race at the expense of the other steps of its influence is obvious to the total distance for the race and there is no ratios constant for these key steps of the triple jump (Mardan & Abdul-Rahman, 2011).

Table (5) shows the correlation of the two-speed the horizontal last step and the step and horizontal speed of step

Variables	Average	SD	Correlation	Tabular value	Contribution ratio	Moral Correlation
Horizontal speed of last step	8,27	0,13	0,68	0,42	46%	moral
Horizontal speed of step	10,11	0,18				

Table (5) the correlation of the two-speed the horizontal last step and the step and horizontal speed of step turning kinetic energy into potential energy into motion and that these changes occur because of the reaction of the earth be horizontal speed is higher than speed vertical was the most influential as the transition from hopscotch to the step you need power to do an estimated (Bullard,1979) times the direction horizontal to get the time speed reaction increases the speed of departure and distance of achievement that the large angle off light jump is due to get a space flight the largest and compensation horizontal velocity lost by jumper using less time to force the passage of the vertical moment of the body's centre of gravity over the feet advancement of the least time possible (Osman,1990).

Table 7. Represents the correlation between the distance of achievement and the percentage of stride length

Variables	Average	SD	Correlation	Tabular value	Contribution ratio	Moral Correlation
Distance of achievement	17,37	0,26	0,49	0,42	24%	moral
Percentage of stride length	30,43	1,3				

As presented in table 7, the correlation (0.49) is greater than the tabular value (0.42). The correlation formed along the step where the proportion of the amount of more than 30% of the distance of the race with a hopscotch ratio more 35% of the jump has formed more than 32% or it was formed approximately one third distance race in the sense that it formed a distance of (5.79) medium. My new studies indicate that jumper who can jump a distance of (8.54) in the long jump, a player the U.S. (Phelps) in the World Championship could achieve a distance of (17.93) and this number is achievable because the champion of the world today has reached a distance of (18 meters) in the triple jump to the presence of correlation and clear similarity of performance variables for both (long jump-triple jump) to a rate approaching the speed of which contribute to the large and important Of the other variables so the more speed he could jumper high achievement high if he had the desire and good trainings based on scientific grounds and there is no fixed proportions between the three phases of jump due to differences in their specifications for jumpers and physical change rates are simple (Jamh,1988).

Table 8. Represents the correlation between the horizontal velocity of the step and the horizontal speed of the Hop

Variables	Average	SD	Correlation	Tabular value	Contribution ratio	Moral Correlation
Horizontal velocity of the step	8,27	0,13	0,49	0,42	24%	moral
The horizontal speed of the Hop	9,25	0,13				

Through Table (8) was the correlation (0.49) is greater than the tabular value (0.42), it means that the distance between the centre of gravity of the body line gravity would be reduced and this leads to reduce the voltage on the working muscles and therefore the value of moment best which provides the opportunity to have the maximum payment and therefore what can be ideal for performance and smoothly(Karim alfadhly,2010). The researcher believes that the rapid movement of the centre of gravity in an instant upgrade and high centre of gravity for the take off and a space upgrade and speed upgrade and the distance legal were significant because of the revocation of the world are superior in many physical attributes and performance art right, as they have high strength and lower limbs, which make them distinct, especially in the Panel to deal with traffic

flow and improve the link between the move and not to hopscotch a significant loss in horizontal speed (Smith & Betty, 1980).

Table 9. Represents the correlation significant between the variables of horizontal velocity of the Hop and the angle of upgrading the leap

Variables	Average	SD	Correlation	Tabular value	Contribution ratio	Moral Correlation
Horizontal velocity of the hop	9,25	0,17	0,58	0,42	33%	moral
The angle of upgrading the jump	21,1	5,35				

Of Table (9) was the correlation (0.49) is greater than the tabular value (0.42), we see a correlation significant between the variables of horizontal velocity of the Hop and the angle of upgrading the leap. It is noted that the angle of upgrading to leap greater than the angle of hopscotch and step for the purpose of compensation for the loss of speed that gets in those stages. In order to increase the distance of flight, up the flight path of centre of gravity of the body to achieve jump discharge of the lowest possible time that the angles of flight of the essential task for the development of performance and achievement and to maintain speed. Through three phases of the triple jump (haben Betty, 1980) how much that any increase in the outcome of the horizontal velocity matched by an increase in normal force required to accomplish the same angle as well as the horizontal velocity will allow jump using less time to force the vertical moment of the passage of centre of gravity of the body above the feet promoting the shortest time possible to get on the corner of a suitable starting that affect the distance of the triple jump, where the total time of contact foot about (0.18) compared to long jump (10 - 0.12) and this is due to the mechanism of performance that different between the them and the stability of one complement the other in the long jump while leading to a single stage. In each of these three stages of re-generation horizontal velocity lost by the body and see Popper (Bober, 1974) that jump trying to redirect his speed horizontal, which intercepted a lot of change to increase the effectiveness of upgrading each time related foot the land of the phases of the triple jump and angles different starting record Popper where the 18° and 16° and 20° each stage, respectively (Bober, 1974).

Table 10. Represents the correlation between the horizontal velocity of the final step and the angle of upgrading to the step

Variables	Average	SD	Correlation	Tabular value	Contribution ratio	Moral Correlation
The horizontal velocity of the final step	8,27	0,13	0,70	0,42	49%	moral
The angle of upgrading to the step	14,1	5,53				

We find a correlation moral of these two variables and this indicates that jumpers took the situation mechanical quality, connectivity and flow of these two variables for the second phase of the jump and then fully prepared for the final stage, a phase jump of losing few of the horizontal velocity with an increase in vertical velocity to get to the stage jump appropriate and which are approximately from (35%) of the total distance of the triple jump (Hay & Koh, 1990). the value of the link of this contribution are good for these two variables as for the mean angle of upgrading of the step was (14.1°) degree which is less than the arithmetic mean to upgrade the jump angle b (6°) degrees of the angle that the upgrading of the step is an important

stage in the preparation phase to upgrade the perfect angle to angle jump, which represents the final phase of this event (John & Miller, 1986).

CONCLUSIONS AND RECOMMENDATIONS

The sample was a proper mechanic to enhance the right situation they present the elite in this event that the player was reached first rank winner distance of the (17.92 m).

- The arithmetic mean of the distance lost is (11) cm and the large proportion has changed from the centres of players in the achievement and this indicates the presence of variation in the last two steps before upgrading to reduce the horizontal velocity of the step before the upgrade as well as to reduce the centre of gravity of the body (3-6 cm).
- The horizontal velocity lost in the process of hopscotch and jump, step and the rate of (9.25) and (7.27) and (7.01) there was a decrease of these stages which affects the rate of achievement (IAAF, 1993).
- The existence of a relationship between high-speed upgrade and jump distance as the velocity parameter is the main one in enhancing to the best upgrade for a distance of projectiles and the contribution rate of more than (80%).
- The angle formed jump (21.1), the highest degree of upgrading of the corners of Hop and step it represents the last phase of the bounce and the fact that horizontal velocity be less in the process of trying to jump the players make more effort and the best angle and in a manner similar to the performance of the long jump (kilani, 1990).

REFERENCES

- Bober. T. (1974) Investigation of take of in triple jump in R.C. Nelson C.A. more chouse Baltimore: University Press first ed p 321.
- Ernie Bullard.(1979). Triple jump Enveloped (The athletic press pasadend) California.
- Hussein Mardan Muhammad Abdel-Al. (2006). Advanced Statistics in Educational Sciences and Physical Education and applications spssi 1 House Warraq Amman.
- Hashimkilani. (1990). Periodic analysis of an elite female tripe jumper (Humanities and social series vol.6 no; 3.1990).
- Hay, J. Biomechanics of the methods of athletic performance, King Saud University, Scientific Publishing.
- Hussein Mardan, Ayad Abdul-Rahman.(2011). Biomechanics in the athletic movements, Press Najaf 1.
- Jamh.H.G. (1988). Practical findings from recent research on the horizontal jumps (TAS funded biomechanics findings, summarized).
- Karayan, M.(1987). The biomechanics of triple jump track and field: quart REV, kalamanzoo. vol.1.
- Koh, T. J., & Hay, J. G. (1990). Landing leg motion and performance in the horizontal jumps I: The long jump. International Journal of Sport Biomechanics, 6(4), 343-360.
<https://doi.org/10.1123/ijsb.6.4.343>
- Miller Jr, J. A., & Hay, J. G. (1986). Kinematics of a world record and other world-class performances in the triple jump. International journal of sport biomechanics, 2(4), 272-288.
<https://doi.org/10.1123/ijsb.2.4.272>
- Mohamed, O. (1990). Encyclopedia of athletics,". Daralalm for publication and distribution, i, 1.
- Qasim Hassan Hussein. (2000) Shaker faith: the foundations of mechanical, analytical and technical events in track and field: Amman house thought i 1.

Sareeh Abdul Karim Alfadhly. Biomechanics applications in sports training and performance motor i 2
Library of Baghdad, 2010 179 p.
Smith,haben Betty.(1980). Analysis of triple of jump (john M. cooper Betty Haven Eds).IAAF.(1993).nsa,
roundtable (Quart. Mag,: vol; n01 p28.



This work is licensed under a [Attribution-NonCommercial-NoDerivatives 4.0 International](https://creativecommons.org/licenses/by-nc-nd/4.0/) (CC BY-NC-ND 4.0).