



Science, Movement and Health, Vol. XV, ISSUE 1, 2015  
 January 2015, 15 (1): 52-56  
 Original article

## THE ANALYSIS OF THE RESULTS OBTAINED IN THE MEN 100 M EVENT IN THE 12<sup>TH</sup> EDITION OF THE ATHLETICS WORLD CHAMPIONSHIPS

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### Abstract

Studying the specialty researches we found that the best sprinters get 92 – 95 % from their maximum velocity (10 – 11,5 m/s), after approximately 30 m of running, meaning at the end of the start launching. The acceleration of the running is based on the gradually increasing of the steps length and frequency, in an optimum correlation. In the next 50 – 60 m, the running velocity is oscillating, reaching peak moments in several times and then, after 80 – 90 m, decreases. The obtaining of some international value results is conditioned by the reaction velocity to the start pistol, the quality of the start and the start launching, the velocity that the athlete can develop during the running, the strength and endurance related to velocity.

*Keywords:* record, athlete, velocity, effectiveness.

### Introduction

In Athletics, in 100 m and 200 m sprint events, the appearance of the Jamaican Usain Bolt gives hope to the world that the 21<sup>st</sup> century man can run the 100 m in less than nine seconds and a half. Bolt succeeded in running the 100 m, without showing that he worked too much, in 9,58 seconds. The progress is enormous, because, in 1900, the fastest man was running the 100 m in 12 seconds. In 1950, man was hardly working to run below 10 seconds, and in 2000 the records were around 9,8 seconds. So, here, the saturation platform seems to be a little bit too far. Especially if we add the fact that, during a 150 m race, Bolt ran the last hundred of meters in 8,7 seconds, this being the best time ever run on one hundred meters. Transforming the Bolt speed in km/h, we obtain an average velocity of approx. 38 kilometers per hour.

It can be easily said, at this moment, who is the fastest man in the world, but studying the race where Usain Bolt broke the world record we concretely observed what makes the difference between him and the other participants. We conducted our research from the curiosity to see how different is the Bolt world record race from the other participants of the final,

from the reaction velocity view point, knowing that he doesn't have a very good start, what was the time to the maximum velocity and what is the difference at each 20 m of the race.

### Methods

Documentation method, comparing method, statistical method, graphical and table method

### Results

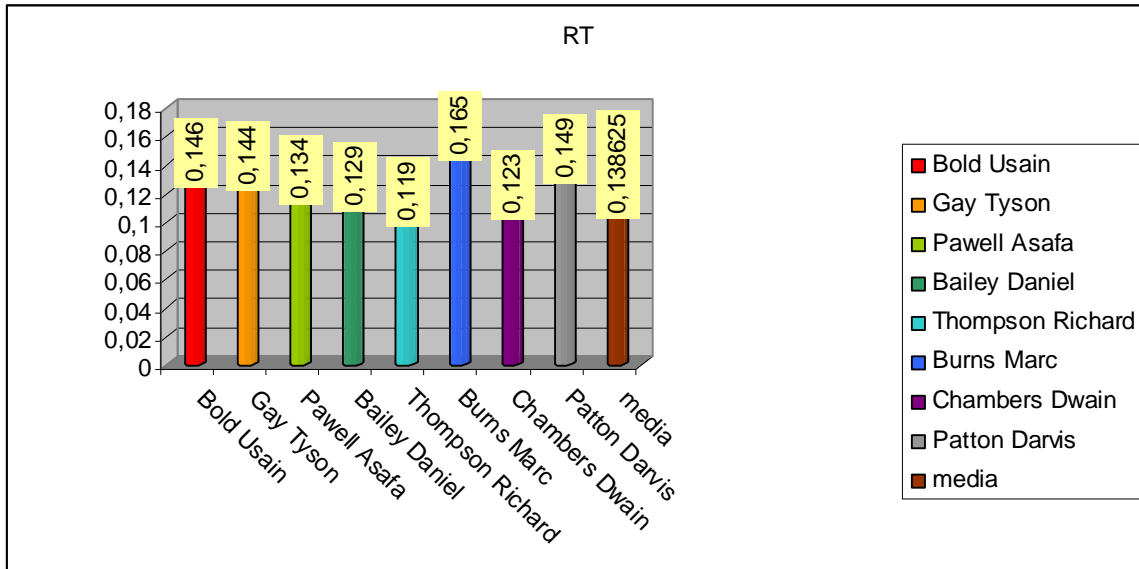
For a better representation we used the International Athletics Amateur Federation (IAAF), where there are presented the results of the 100 m final from the Athletics World Championship, Berlin 2009, but also the reaction times the times recorded at 20 m, 40 m, 60 m, 80 m, and 100 m of the race. These data allowed us, based on some calculations and graphics, to analyze this race and to make some conclusions. From the 8 finalists, 5 of them ran the 100 m below 10.00 seconds, 2 of them ran exactly 10.00 seconds and only one broke the 10.00 seconds barrier, what makes us to say that it was the fastest final of all times, the results average being 9.92 seconds.

Athlete	RT	t20m	t40m	t60m	t80m	t100m
Bolt Usain	0,146	2,88	4,64	6,31	7,92	<b>9,58</b>
Gay Tyson	0,144	2,92	4,7	6,39	8,02	<b>9,71</b>
Powell Asafa	0,134	2,91	4,71	6,42	8,1	<b>9,84</b>
Bailey Daniel	0,129	2,92	4,73	6,48	8,18	<b>9,93</b>
Thompson Richard	0,119	2,9	4,71	6,45	8,17	<b>9,93</b>
Burns Marc	0,165	2,94	4,76	6,52	8,24	<b>10,00</b>
Chambers Dwain	0,123	2,93	4,75	6,5	8,22	<b>10,00</b>
Patton Darvis	0,149	2,96	4,85	6,65	8,42	<b>10,34</b>
Media	0,139	2,92	4,73125	6,465	8,15875	<b>9,92</b>

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 Received 19.10.2014 / Accepted 26.11.2014

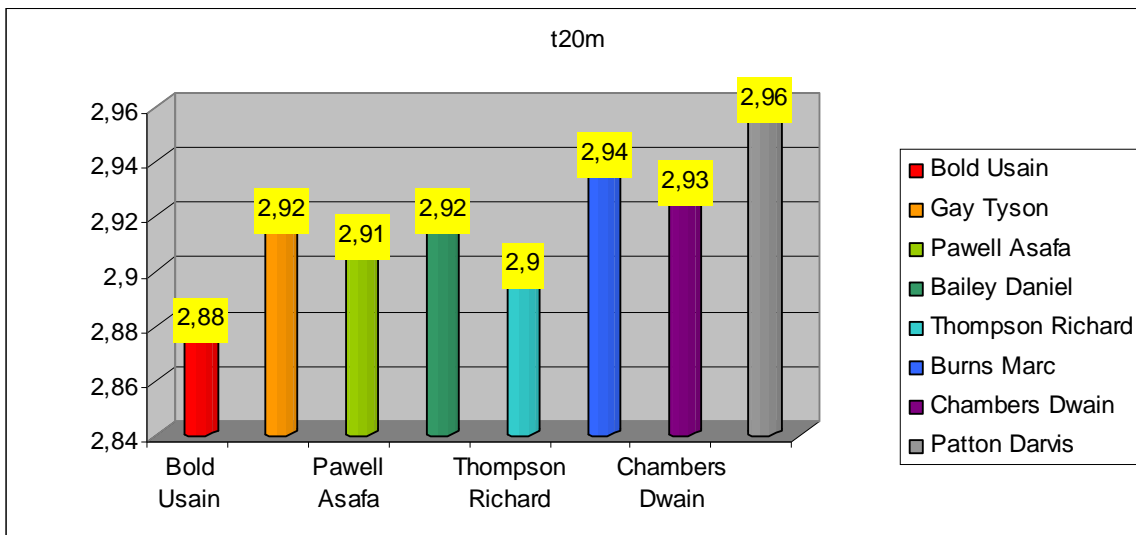
It is known that, in the 100 m race, an important factor in achieving a time as good as possible is the starting reaction time. With all these, the athlete that achieved a world record in this race had the 6<sup>th</sup> reaction time, this athlete having some small problems in this direction as he mention this during a after race

statement. This makes us to believe that in a near future this record could be overcome. He tried this during the next World Championships, but the desire to demonstrate that he is the best and achieve a new world record made him to get a false star.



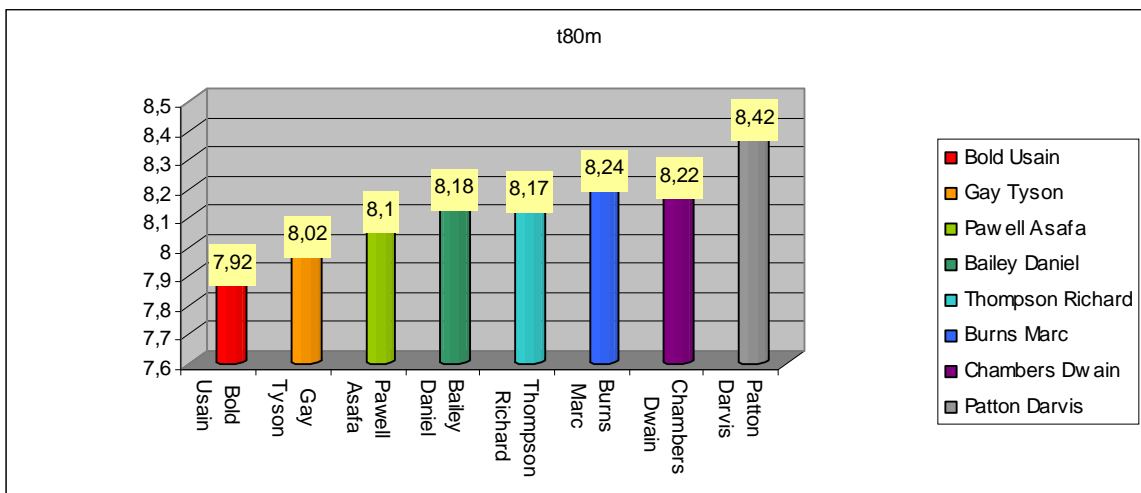
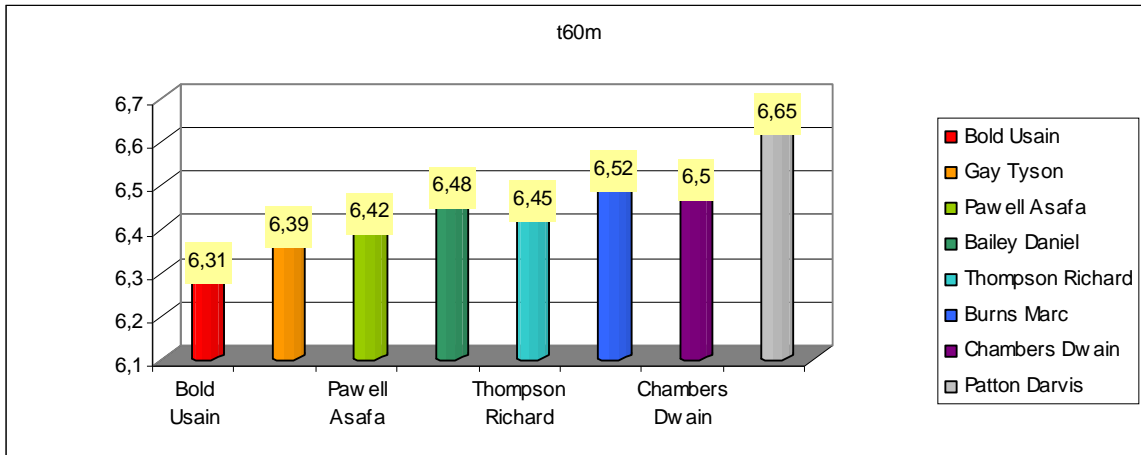
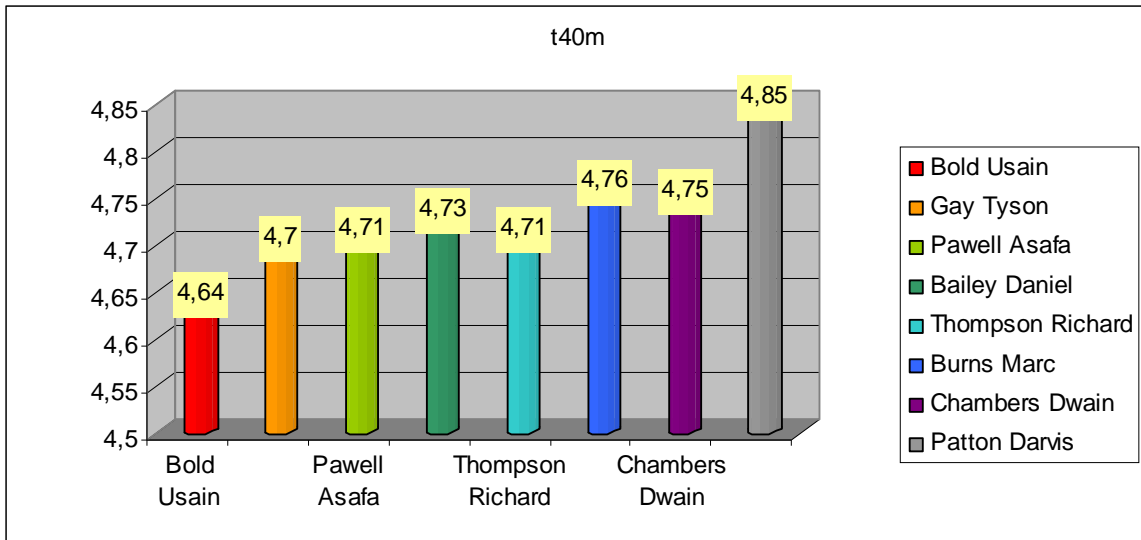
**Discussion**  
 Studying the race by fragments, from 20 to 20 meters, we can observe the strengths that provided the world record. At 20 m, despite the fact that the athlete

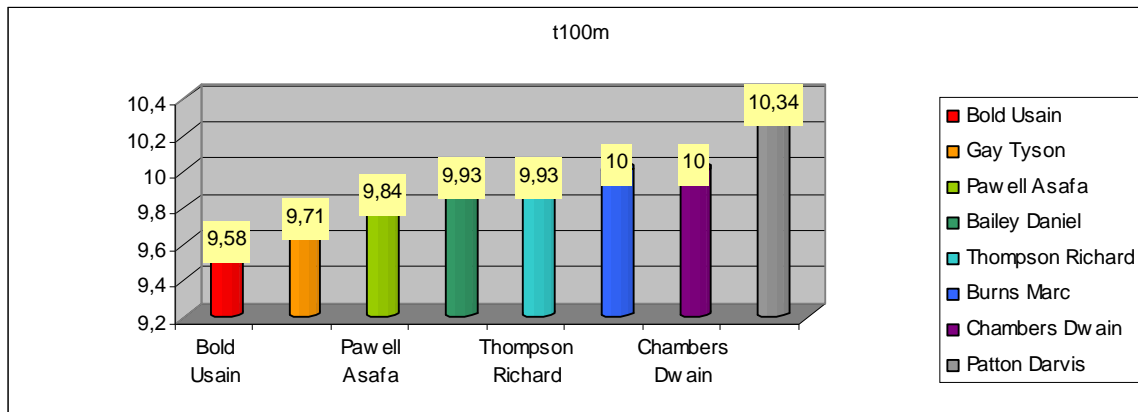
is very tall, with long lower limbs and hard to integrate in a rapid motion, is already the first with a 2,88 s time and a 0,04 s before the one who will come on the second place.



At 40 m the final configuration of the race was already established, the first three athletes leading already, with Bolt having an advantage of 0,06 s. At 60 m the advantage increases to 0,08 seconds, and at 80 m the distance increases to 0,1 second. Studying

the values recorded at every 20 m of the race we observe that the first athlete wins 0,02 seconds at every recording, excepting the last distance where he gets an advantage of 0,03 s.

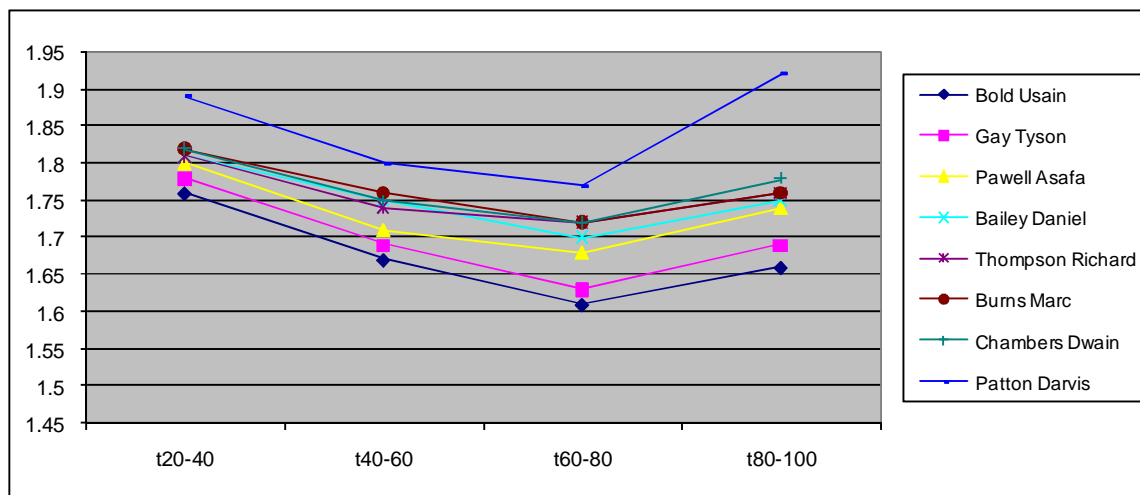




Studying the recordings achieved by the finalists at every 20 m of the race, we can observe that these are decreasing, the lowest value being recorded between the 60 m and 80 m of the race, for all the athletes, what allows us to say that the maximum velocities of the greatest athletes of the 100 m are obtained at the approximately 50 – 60 m of the race. Also, the recorded values during this distance are the

best from all, even from the ones recorded during the last part (80 – 100 m), concluding that, despite the fact that we are talking about the best sprinters of the world, ones they are obtained, the maximum velocities can't be maintained until the end of the race, being approx. equal to the ones obtained during the third interval (40 – 60 m).

Athlete	t20-40	t40-60	t60-80	t80-100
Bold Usain	1,76	1,67	1,61	1,66
Gay Tyson	1,78	1,69	1,63	1,69
Pawell Asafa	1,8	1,71	1,68	1,74
Bailey Daniel	1,81	1,75	1,7	1,75
Thompson Richard	1,81	1,74	1,72	1,76
Burns Marc	1,82	1,76	1,72	1,76
Chambers Dwain	1,82	1,75	1,72	1,78
Patton Darvis	1,89	1,8	1,77	1,92





### Conclusions

- The world record in the 100 m men events can be improved if the athlete that obtained it improves the reaction time.
- In this event the athletes have values approximately equals, the difference being very small and determined by a very good start or the obtaining of a superior velocity and its maintaining during a distance as far as possible
- All the athletes obtain the maximum velocity around 60 m distance and have the best recorded interval between 60 m and 80 m, and

also, they cannot maintain this speed until the end of the race

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