

“Fastest of All Time?”

“J Sports Sci. 2011 Sep 14. [Epub ahead of print]

The changing shape characteristics associated with success in world-class sprinters.

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Source

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Abstract

The aims of this study were to identify whether relative shape and size characteristics of world-class sprinters have changed over time, and whether any anthropometric parameters characterize the most successful world-class sprinters. The results suggest that body mass index, reflecting greater muscle mass rather than greater adiposity, is an important factor associated with success in both male and female world-class sprinters over time. However, in female athletes the reciprocal ponderal index (RPI) has emerged as a more important indicator of success over several decades, with taller, more linear sprinters achieving greater success, as measured by sprint speed. In male sprinters it is only in the most recent decade that RPI has emerged as an important predictor of success. We speculate that the prominence of the RPI and an ectomorphic somatotype being typical of the most successful world-class sprinters might be explained, in part, by the influence of stride length on sprint speed. In conclusion, these results suggest that coaches, selectors, and sports scientists should consider body shape when selecting potential athletes for sprint events, encouraging more linear athletes with a high RPI.

PMID:

21916672

[PubMed - as supplied by publisher] ”

<http://www.ncbi.nlm.nih.gov/pubmed/21916672>

I agree w/ the premise of the research article, but not w/ the speculations. Again, speed has proven to be a direct result of 1) the summation of Ground Reaction Force(s) and 2) the duration of the application of the GRF. A longer acceleration “push” application or a longer top-end speed “pull” application will most likely lead to a faster run as long as the force vectors are aligned properly.

The part that I disagree w/ is in the common misnomer that all tall athletes are an ectomorphic somatotype. Usain Bolt is tall for an average sprinter, but he is far from an ectomorph. They’re characterized by long & lean frames, but that is normally

accompanied w/ a lack of substantial muscular development. A mesomorphic somatotype is the "classically well-muscular, athletic frame" as the endomorphic somatotype is the "large-boned" frame. But we have to remember, that is an individual reference and not a reference to comparative values. Usain Bolt (6'5" @207lbs), Detroit Lion's WR Calvin Johnson (6'5" @240lbs), Orlando Magic's Dwight Howard (6'11" @265) are all tall athletes, but far from ectomorphic somatyped. They are scientifically referred to as tall mesomorphs. Like-wise, Allyson Felix (5'6" @125) isn't considered tall in height, but is described as an athlete who "runs tall". This means she utilizes every fraction of an inch of her force production through great mechanics and great mobility, producing a very long, powerful and fluid stride. Allyson Felix, Ethiopian Distance Runner & World Record Holder Haile Gebrselassie (5'5" @123lbs) and NFL Hall of Fame Running Back Barry Sanders (5'8" @203) all were "not-as-tall" athletes but possessed optimized stride lengths that even the tallest of runners envied.

Although recently published and well written, these results are neither new nor shocking. Someone of Usain's talents on the track would've gone long forgotten if he were born and raised in the USA. Football and baseball coaches would've recognized his pension for quickness early and would've swept him off of the track by HS but no later than college. Think of the speed burners that have graced the fields throughout the ages. Now imagine if there was comparable revenue to be made, allowing them to concentrate and focus their performance envelopes on the track. A few Tier 1 names come to mind immediately w/ the likes of Darrell Greene (5'9" @184lbs), Deion Sanders (6'1" @200lbs), Bo Jackson (6'1" @220lbs), Randy Moss (6'4" @210lbs), baseball's Ricky Henderson (6'0" @180lbs), NBA's Allen Iverson (6'0" @165lbs) & Wilt Chamberlain (7'1" @275lbs, was a reported sub 10:sec 100M & sub 49:sec quarter miler). So, the study does help to support the notion that "longer force production" is a key factor in running fast, there is an incorrect reference to the various types of somatotyping. A common field rule of standards (as a bell-shaped curve of reference) is to grab your wrist w/ your thumb and middle finger. A) The more that they over-lap: higher percentage of ectomorphic somatotype, B) If they barely touch: mesomorphic somatotype and C) The less they barely touch to full separation: endomorphic somatotype.