

IS THE JUMP-DOMINATED TECHNIQUE IN THE TRIPLE JUMP THE BEST FOR ALL?

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Dear Sir,

As a coach interested in field events, particularly long jump and triple jump, I have been a keen reader of Dr. James Hay's books and articles. Dr. Hay's "Biomechanics of Sports Techniques" was the first major text in Sports Biomechanics translated to Portuguese and published in Brazil, so he is well known here. His research on horizontal jumps seems to be, from my point of view, his most important contribution to track and field.

I was amazed when I found his article "The Case for a Jump-Dominated Technique in the Triple Jump" published on Track Coach #132 (Hay, 1995). I really appreciated to see a scientist of his caliber preoccupied with practical questions, talking our language, interacting and changing information with coaches. Anyway, I feel the need of more research to support the assumption that a shorter hop and a longer jump will, as a rule, maximize the triple jump performance. I would like to raise some questions about specific points covered by Dr. Hay:

1. Russian School X Polish School. I have got serious doubts if these "schools" really exist. The polish school is recognized due the great Josef Schmidt, whose achievements include the first leap above 17.00m. However, far before him, the Brazilian Adhemar Ferreira da Silva became the first man to break a World Record using a balanced technique. He was, in fact, the first to produce 30% at the step phase (McNabb, 1977). So, why people do not talk about a "Brazilian School", that has produced, after Adhemar, two other World Record breakers in triple jump?
2. Hay affirms that "Seeking to increase the distance of a triple jump by progressively increasing the length of the hop is ultimately destined to produce failure in the form of weak step phases, aborted attempts and injury". It seems there is no doubt that when you over-hop you can abort your attempt - either due balance problems or impossibility to cope with the high impact forces - and the likelihood of injuries increases. The question not yet answered

is “what is over-hop?”. On a research conducted at the Biomechanics Laboratory of São Paulo University (Moura et al., 1994), we studied the performance of triple jumpers (males and females) during the 1994 IAAF São Paulo Grand Prix - including among the subjects Conley (USA), Quesada (Cuba), Anísio Silva (Brazil), Lasovskaya (Russia), Chen (Russia) and Montalvo (Cuba) - and we found no relationship between hop length and step length (Table I). So, to say that a large hop leads to a weak step phase does not find support on published data.

Male (Female)	HOP	STEP	JUMP
TRIPLE	0.43 <i>(0.86)</i>	0.70 <i>(0.44)</i>	0.37 <i>(0.73)</i>
HOP	-	0.09 <i>(0.17)</i>	-0.50 <i>(0.56)</i>
STEP	-	-	0.05 <i>(-0.13)</i>

Table I. Correlation matrix - 94 IAAF São Paulo GP (Female values in italic).

3. Conley used a hop-dominated effort to jump 17.78m in 1985 (Miller and Hay, 1986). In 1987 he achieved a legal 17.87m, that remains as his personal best. As noticed by Dr. Hay (1995), with the jump-dominated technique he has jumped a foul 18.05m and a wind-assisted 18.17m. These are amazing performances, but how can we attribute such improvement only to changes of ratios? We should not forget that in 1983-1985 Conley was using a double arm action at the hop take-off that hampered his horizontal velocity, and that has been considered by coaches around the world as a serious technical error (Hutt, 1988; Donley, 1991). It is very difficult to isolate the factors that determine a successful jump, and perhaps his jumping ratios was not so far from the ideal effort distribution to him, at that time.
4. In previous studies, Hay (1990) acknowledges that there isn't a single technique to be recommended to every jumper, but probably, considering individual characteristics, an optimal technique to each athlete. In a very comprehensive review of triple jump's

biomechanics, his thought did not change (Hay, 1992). Since then, we haven't heard anything about new researches that could modify this belief.

In order to be fair with Dr. Hay, I must say that on our study previously mentioned (Moura et al., 1994), the Brazilian Anisio Silva attained his best result of the day (17.03m) exactly when he reduced his hop and lengthened his jump. We have been trying to interpret the triple jump techniques as a matter of energy conservation, and we believe that a too long hop tends to lead to greater losses of energy, but we have no data to support this affirmation, nor do we know what is a too long hop. Anyway, Brazilian coaches (myself included) tend to ask their triple jumpers to hop low, in order to keep as much velocity as possible, and to strive for very active landings. The final product - hop-dominated, jump-dominated or balanced technique - shall be result of the physical and technical qualities of the jumper.

I believe that probably many jumpers over-hop, what seems to be particularly true among females. But I don't think that all hop-dominated jumpers over-hop. On the other side, it is possible that some jump-dominated athletes are so conservative on their hop efforts that they aren't able to recover the distance lost at this phase later, on the two following phases (It's hard to think about a jumper approaching the board above 11.0 m/s and jumping less than 5.80m at hop, as Mike Conley as been doing. Should I ask all my junior 15.00m jumpers to hop bellow 4.80m? Or my female 12.60m jumpers to hop less than 4.00m?).

We can't forget that model techniques must be idealized with scientific principles behind them, and sometimes highly successful athletes just copy each other or follow their feelings, what can distort our judgment. Anyway, I am looking forward to knowing about the jumping ratios of Jonathan Edwards, what can give us more insight to this discussion.

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