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Challenges in Sprint Relay and Their Probable Solutions: A Review

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Abstract – The study highlighted several issues related to baton exchange in sprint relays. The main difficulty of a sprint relay is due to baton exchange in high speed and its non-visual nature. Many times superior sprinters are seen losing a relay race because of poor baton pass. Some authors say that verbal commands in the relay are also to be blamed. Relay runners and coaches also agree to these factors affecting relay but they are unable to find any solution other than setting up accurate check marks and spending more time practicing together as a team for relay. Silent exchange could be tried out to eliminate the dependence on verbal commands in 4×100-meter relay.

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INTRODUCING RELAY RACE AS A PART OF TRACK & FIELD

Relay events are an integral part of the sport of track & field. Relays are the only events in track & field that focus on team efforts other than individual performances. Relay events are undoubtedly the most popular events in a track & field meet. Some Relays are so popular that it enjoys the similar status like carnivals, such as Drake relays and Penn relays (Rogers, 2000). Relay events are also critical for teams to win a track & field meet. That is why sports teams and educational institutions emphasize a lot upon relay events (Colfer, 1977). Relay races have its origins as torch relays in ancient Greece which was a non-competitive event before turning into a part of athletic competition. Modern forms of relay races are 4×100 meters relay and the 4×400 meter relay.

HOW A RELAY RACE IS RUN?

Methods of baton pass- Four athletes run an equal distance in a team, with a cylindrical baton. Runners carry the baton one after another from start to finish. Incoming runners passes the baton to the outgoing runner within the changing/ take over zone. Three exchanges take place in a relay event - between first and second runner, between second and third runner and between third and fourth runner (Uppal, 2006).

DIFFICULTIES OF SPRINT RELAY

In 4×400 meters relay eyes of the outgoing runner is focused on the baton until it is firmly grasped. But, 4×100 meters relay is completely different where batons are passed while sprinting in top speed. This is why a nonvisual (or blind) pass is used in 4×400 meters relay, where the outgoing runner doesn't look back to the incoming runner. Apart from this blind part of the skill, compulsion of baton pass within the 20 meters zone is another challenge that is imposed on the outgoing runner. Usually, the exchange occurs approximately 5 meters prior to the end of the change-over zone (Carr, 1991). All these challenges makes baton pass in a sprint relay a very difficult skill. Colfer (1973) said that it is very common to witness a team with superior speed defeated. This loss is usually due to the baton pass. Carmelita Jeter, a member of the 4×100m World record holder relay team from USA said once "You can't assume anything in a relay…. anything……anything….can happen".

Throughout the history of modern Olympic, USA dominated relay events. But, because of a poor baton pass they had to lose to UK in Athens 2004. In Beijing Olympics 2008, both the United States men's and women's 4×100-meter relay teams had dropped batons. Those poor relay performances despite having world's greatest runners insisted the chief executive of USA Track & Field carry out a comprehensive review of the entire relay program.

FACTORS FOR SUCCESSFUL RELAY PERFORMANCE

Importance of the sprint relay and unpredictability of the event made researchers interested in investigating the complex phenomenon of 4×100 meters relay. Researchers have developed mathematical models related to 4×100 meters relay race (Murphy, 1992; Ward-Smith & Radford, 2002; Masedu & Angelozzi 2006). Ward-Smith & Radford (2002) have constructed Mathematical models that investigated the factors affecting 4×100 meters relay performance. They found apart from sprinting speed, are the starting positions of the runners on legs 2, 3 and 4, the free distances at the baton exchanges and

the running order of the athletes and lane draw were vital factors. Salo (2001) studied the interaction between pairs of two athletes running velocity and position in relay baton exchange and suggested that it is more beneficial if the baton exchange is executed late in the exchange zone. With integer linear programming they showed that performance in relay depends upon lot of other factors such as the starts of the last three runners (Salo & Bezodis, 2004), the stick exchange technique (Match, 1991), the distance between carrier and receiver (Boyadjian & Bootsma, 1999).

A study by Dostal (1974) of the 16 national teams that made the 1972 Olympic semifinals showed a definite trend toward one overall method. Not being blessed with great sprinters as in US, and so compelled to minimize time-loss in baton passing, the national specialists of these countries have studied related techniques very carefully. Dostal's conclusions are therefore of special value. In summary, they were:

- A strong predominant use of the upward baton thrust.
- No switching of the baton by a runner from one hand to the other.
- Runner taking the baton on the curve receive with the inside left hand; those on the straight, with the outside right hand. That is, the baton is carried by successive runners in the right-left-right-left hands.
- Baton exchange occurs in the last quarter or fifth of the passing zone (50-60 feet), the point of maximum speed for both the runners. At the moment of exchange the torsos of the runners are about one meter apart.
- The second and the fourth runners started from a half-crouch position, with one hand on the ground, and the inside left leg forward for better balance and support while waiting, and better arm-leg coordination on the first step.
- Some of the third runners also used the Korobkov method, with the head turned inwards through receiving on the straight and taking with the outside hand.

PROBABLE SOLUTIONS

Borden (2012) interviewed members of U.S relay teams to know the difficulties they faced which are also the probable reasons behind an unsuccessful baton pass. It was clear that the team that have more individual medal contenders of sprinting events, doesn't get the opportunity to practice together for long. Whereas Italy and Poland relay that have dedicated relay teams that doesn't consist of the fastest sprinters, many times performed better than other teams. Establishment of accurate check marks on the basis of deceleration velocity of incoming runner and acceleration velocity of outgoing runner is also important for successful baton exchange.

Moss (2002) believed that verbal commands may also create nuisance as all the teams use verbal commands almost at the same time. This is most chaotic especially in the third or last exchange of a 4×100-meter relay where al exchange zones are very close to each other. This may confuse the outgoing runner in a blind exchange where situation may be worsening with a crowd noise. Similar incident happened with the Jamaican 4×100 relay team in the finals at the World Athletics Championships. Tucker (1999) mentioned about a technique (silent exchange) that need no verbal command. Similar silent techniques have been used by athletes in other track & field events such as Long Jump, Triple Jump, High Jump, Pole Vault, and Hurdles where they count number of stride silently.

CONCLUSION:

Relay race performances of 4×100 meters could be bettered by taking advantages of free distances, performing a late exchange inside the exchange zone, not switching the baton from one hand to another etc. But, all these precautionary measures may not avoid setbacks in sprint relay. To avoid the incidence of dropped baton in 4×100 meters relay establishing accurate check marks are necessary. Relay team members also should train together for a considerable period. Apart from this, the dependency on verbal commands is too much in sprint relay and need to be reduced. Silent exchange can be considered for sprint relays.

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