The Social and Environmental Constructs of East African Middle- and Distance-Running Success

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At the 2008 Beijing Olympics, the East African nations of Kenya and Ethiopia won 10 gold medals in middle- and long-distance running events. Overall, they accounted for 20 of the 33 available medals in the distance events. Likewise, the athletes from these nations currently hold over 90 percent of all-time world records and current top-10 positions in the world event rankings (Wilber & Pitsiladis, 2012). This modern success can be traced back to the 1968 Mexico City Olympics, in which Kenya and Ethiopia displayed dominance in these events that the sport of track and field had not seen before. During those Olympics, Kenyan male runners won three gold, three silver and 1 bronze medal while Ethiopia's Mamo Wolde won gold in the marathon and silver in the 10,000-meter run. Despite not competing until the 1956 Melbourne games and boycotting the 1976 games, no nation has matched the success of Kenya and Ethiopia on the Olympic level.

Many theories and arguments have surfaced detailing the reasons behind the success of these nations. It must be noted that even though these countries have a reputation for distance running success, most of the elite athletes produced come from particular regions and tribes, leading to assertions that specific geographical clustering proves that these athletes have developed the proper genes for running. For example, the Arsi region of Ethiopia contains five percent of the country's population, but accounted for 14 of the 23 distance runners selected for the 2008 Olympic team. Similarly, the Kalenjin tribe of Kenya has less than 0.1 percent of the world's population, yet is residents have won 50 middle- and long-distance Olympic medals. This geographical disparity has led to proposals that genetic similarities may exist in these populations that give them a distinct advantage in distance running.

Although the research varies, the majority of researchers do not believe that one gene sets these people groups apart:

"It is perhaps unlikely that East Africa is producing unique genotypes that cannot be matched by those from other areas of the world, but more likely that those in East Africa with an advantageous genotype realise their advantage through having used it regularly, (Scott & Pitsiladis, 2006, p. 182).

Essentially, these "distance running" genotypes probably exist in many elite athletes, but the environmental and social situations East Africans live in, require them to utilize these genes. Scott and Pitsiladis (2006) add, "It is interesting to note that Ethiopia and Kenya do not share a similar genetic ancestry, as defined by mtDNA, but what they do share is a similar environment: moderate altitude and high levels of physical activity," (p. 182). The argument of nature versus nurture in distance running is complicated and still in the process of being researched further. This paper will examine that nurture aspect, that social and environmental constructs, including youth sport, diet, geographical setting, economic opportunity, training practices, and tradition are the main factors contributing to the East African success in middle and long-distance running.

Youth Sport

Less than one percent of the Kenyan population has vehicles. This lack of automation requires East African children to walk or run at an even-pace to and from school each day. This allows children to lay down a solid aerobic base from about the age of seven, continuing on to about the age of 21, when they graduate from high school (Lantz, 2008). It has been hypothesized that because of extensive walking and running to and from school at an early age, Kenyan and Ethiopian distance runners develop a high maximal oxygen uptake (VO2MAX). Having a higher VO2MAX will ultimately contribute to exceptional endurance-running

performance if applied. A study done by Onywera, Boit and Pitsiladis (2006) reported that 86 percent of Kenyan international-level runners used running (versus walking or vehicle transportation) as their main source of traveling to school as children. In comparison, only 23 percent of non-athletic Kenyan control subjects reported they had run to school as children. The same applies to Ethiopia, where 68 percent of elite runners said they used running to travel to and from school, while 24 percent of non-athletic Ethiopians said they ran to school. Elite Ethiopians said their travel to and from school totaled between five to 20 kilometers per day. A study by Saltin, Larsen and Terrados (1995) showed that East African children who had used running as a means of transportation had a VO2MAX 30 percent higher than those who had not, therefore implicating distances travelled to school as one of the reasons for East African running success. Although, a VO2MAX difference between elite runners from East Africa and the rest of the world has not been proven, performance results indicate an advantage. When compared to United States children, East African children have already developed eight years of aerobic base building before an American teenager finished their first year of high school track and field. Saltin et al. (1995) have demonstrated that factors such as increased childhood activity and hard training are probably the major contributors to the superior performance of Kenyan runners.

Besides distance running, soccer is an extremely popular sport in Kenya and all of East Africa. Soccer was introduced to East Africa early in the 20th century by administrators, missionaries, teachers and farmers. Kenya and Ethiopia took naturally to this sport, because it was simple in nature. It is particularly popular in Kenya because it appeals to people of all socioeconomic classes and cultures, unlike sports such as golf, tennis and swimming that are still not as universal in popularity (Njororai, 2009). Today, if a child cannot be found at school or working, they will most likely be playing soccer. Soccer allows children to develop and maintain

fast-twitch muscles while they build an aerobic base. The directional changes that take place in soccer strengthen the leg tendons and ligaments that are utilized during hard running. This is compared to the United States, where popular sports like baseball and football do not develop any aerobic capacity or strengthen muscles and ligaments used in running.

Diet:

Due to the financial issues in Kenya, where the majority of people live on less than $2 dollars per day, food can often be scarce. But because of the lack of resources, the food that both children and adults eat is often beneficial for endurance events. Onywera, Kiplamai, Tuitoek, Boit and Pitsladis (2004) have reported that a traditional Kenyan diet is composed of 10 percent protein, 13 percent fat, and 77 percent carbohydrate. This diet is low-fat and high carbohydrate and is consistent with research-based recommendations for endurance-sport athletes. Beis, Willkom, Ross et al? have found Ethiopian diets consists of 13 percent protein, 23 percent fat and 64 percent carbohydrate. The Kenyan and Ethiopian diet includes vegetables, fruit, rice, and unrefined sugar, as well as a traditional Kenyan dish known as ugali, which has a very high glycemic index. Most of the population does not eat and drink sugary substances because of the high cost, which keeps the general population lean and at a weight that is beneficial to distance running. Kenyans also consume a chai-like tea, which serves as an energy drink to replenish glycogen stores immediately after training. Both the Kenyans and the Ethiopian diets appear to be favorable for training and performing in middle- and long-distance running events. Although they do not differ from those of other elite athletes from around the world, their eating habits are formed from a young age, giving them a distinct advantage once they enter the sport as they already have the optimal diet and are at an optimal weight for distance training.

Geographical Setting

Much of the perceived notions about the weather patterns in Africa are related to desert-like conditions, where hot and dry weather prevail. But for much of East Africa, especially Kenya and Ethiopia, the weather is ideal for distance running training. The workouts that the athletes complete are done in the mountains, where temperatures are around 60 degrees most of the year. According to Lenz (2008) East Africans have the perfect training temperature all year, which allows the athletes to do more difficult work without expending energy trying to cool down the body. The result is that the heart can work to create new capillaries instead of being taxed to push blood to the surface of the skin in order to cool the body off. Because Kenya is located on the equator, there is little change between seasons, keeping workouts consistent all year.

Most of the elite runners from Kenya come from the Kelenjin tribe, who reside in the rolling hills of the Great Rift Valley, a region that is geographically separated from much of the country and that sits at an elevation ranging from 1830 meters to 2450 meters. Similarly, the Ethiopian tribes of Arsi and Shewa live in the highlands of the Great Rift Valley and train at altitudes from 2355 meters to 3000 meters. The runners that live at this elevation level, seem to have an innate ability to train at relatively high intensity despite the physiological strain and limitations imposed on humans during exercise in hypoxia (Wilber & Pitsiladis, 2012). Researchers have determined that a characteristic that sets Kenyans apart may be their ability to train on a consistent basis at running velocities that match or surpass race pace, even at altitude (23). In contrast European and North American runners seem unable to train at altitude without breaking down. When they are exposed to altitude, it is usually done in training blocks, not all year round like East Africans.

Whether the ability to do high-intensity running at altitude is a genetic predisposition resulting from living at 2000 to 2500 meters versus some other factor is not known. But it is widely believed it is an important factor to their success, even though Kenyan athletes and officials widely detest this notion. Kenyan coach Mike Kosgei passionately notes, “If running success is based on altitude residence, then why doesn't Columbia and Nepal produce great runners like Kenya. Our success is based on hard work and attitude, not altitude, “ (Tanser, 1997). But it is logical to assume that consistent exposure to living and training at altitude is an advantage much of world does not share with East African runners.

Economic Opportunity

Kenya is advanced in many aspects of their society, especially when compared to other countries in the region. But Kenya still reports an unemployment rate of around 40 percent and roughly half of the Kenyan population lived below the World Health Organization (WHO) poverty line. Likewise, 39 percent of Ethiopians live below the WHO poverty line and their unemployment rate has reached 35 percent. These contributing factors provide an East African distance runner motivation to pursue the sport seriously. Author of the popular running site Letsrun.com, Weldon Johnson (2007), writes:

“Running in Kenya is by and large about one thing: opportunity. I could switch the word opportunity with the word money, but in the West that would imply greed. And most people in Kenya trying to run are often very poor especially by Western standards, but they are trying to improve their lot financially and they see running as their one shot to make a lot of cash in their lives...There is little drawback to trying to be a professional runner especially if you can catch on with a training group and get your meals covered. If the alternative to training full-time is to

make a $1 a day, many people are willing to give training full time a shot. Or they are willing to train for part of the day."

Onywera et al. (2006) found that among Kenya's elite distance runners, 33 percent listed economic success as the primary reason they trained and competed. This was interestingly higher that other motivating factors, such as "Olympic glory," which 14 percent of elite Kenyans listed as their primary reason. An example of how quickly talented Kenyans can rise to the top is Robert Kipkoech Cheruiyot, a four-time winner of the Boston Marathon. Cheruiyot had been homeless and living on 30 cents a day before he got the opportunity to train with a major training group which included Kenyan marathon star Moses Tanui. His first win at Boston garnered him $80,000 dollars which he used to buy a large plantation farm and a house in Kenya. A few years later he would be a multi-millionaire, even though he would never compete in the Olympics or any large international competition (Powers, 2007). The example of Cheruiyot and countless other East Africans show that being a successful runner in Kenya or Ethiopia can translate into economic success and social advancement not only for the runner, but for their extended and immediate family.

Tradition

As mentioned earlier in this paper, the success of Ethiopian and Kenyan distance runners did not start until the 1960s. For Kenya, Kip Keino began a legacy of excellence in 1968 and has been followed by the likes of Henry Rono, Peter Rono, Paul Tergat, David Rushida, Sammy Wanjiru and Catherine Ndereba. Many of these athletes got started in the village of Iten in schools such as Saint Patrick's High School, which serves as Kenya's "running factory" turning students into elite athletes. Promising young athletes are put in an environment where they are exposed to the tradition of Kenyan distance running excellence, which is accompanied

by high expectations to succeed. Many of these young athletes will not become elite, but they all believe they will, as it has been done by numerous people from their respective villages.

Likewise, Ethiopia's success began with a gold medal performance by Abebe Bikila in the 1960 Rome Olympics marathon. He has been followed by the Olympic or World Champions Mamo Wolde, Miruts Yifter, Haile Gebrselassie and Kenenisa Bekele. Many of Ethiopia's young aspiring runners train at the country's "field of dreams," which is located in Addis Ababa's. Much like Kenya, the sheer number of young athletes wanting to become successful is so many that most will not make it, but those who do often become the best. As two-time Olympic champion Halie Gebreselassie has stated,

We have so much inspiration. We want to be like Bikila, Wolde, Yifter. The gave us reason to dream and hope. They are our role models. We see in them something that sparks our imagination and encourages us to change our lives for the better. (Denison, 2004)."

Much like Michael Jordan, Joe Montana and Derek Jeter have inspired generations of American youth, so have great Ethiopian and Kenyan runners inspired legions of champions. This motivation for continuing a tradition of excellence can not be ignored as an important aspect behind the success of Kenyan and Ethiopian distance runners.

Training Practices

There are numerous cultural intricacies that allow Kenyans to have naturally built in training advantages that do not exist for those outside East Africa. Although elite Kenyans will always train and compete in proper running shoes, 99.5 percent of East African children will run barefoot for the first 14 years of their life, (Lenz, 2008). The absence of shoes as a child has several advantages in terms of running, especially when most of these children run to and from school everyday. These advantages include developing proper running technique at a young age,

not acquiring knee and ankle injuries due to bad shoes and uneven shoe wear and the development of lower foot and leg muscle strength. Though many will turn to running shoes later on in life, teenagers and elite athlete will still conduct workouts without shoes, which allows for quicker recovery and the ability to do high intensity workouts. By the time American athletes become elite, they have not developed the ability to due high amounts of barefoot running, leaving them at a disadvantaged in terms of avoiding injuries and having greater foot strength.

The educational sport system in Kenya, although nearly non-existent, gives them an advantage over many of their counterparts. There are no organized track or cross country seasons like there are in the United States. Thus, there is nothing to interfere with the base-building phase. There are no races or championships to interfere with training, so young Kenyans and Ethiopians can build up a great amount of aerobic capacity before ever competing. This also prevents injuries, as high-risk interval training is avoided. In the United States, coaches feel pressure to have their athletes succeed early and thus push them into harder workouts that lead to injuries.

Another aspect is the lack of extracurricular activities. There are limited jobs for teenagers and few other sport opportunities or after school programs that might conflict with training. Likewise, romantic relationships are less emphasized at a young age as Lenz (2008) describes:

"In East Africa culture, a man does not date girls until he is at least 21. In my tribe the age is closer to 22/23 years. This is because the duration of courtship for marriage (in most cases) is less then one month, and even then the young man needs to hold down a suitable job if he is to marry a young woman. You may think this is an irrelevant point but the environment in Kenya makes it much easier for athletes to engage in 7-10 year training programs," (p. 5899).

The social factors that lead to East African success are still being explored. But the lack of shoes, the de-emphasis on competitive youth sport and the relationship practices in East Africa provide a sample of the many cultural differences that harbour running champions.

Conclusion

It is naive to believe that all of the social constructs that help East Africans succeed are always beneficial. The financial pressure to succeed can lead athletes to be very short sighted, as better results equal money. If the results do not come quickly, you will most likely be dropped from a training group and the chance at success may disappear. The opportunity for Kenyans to make money will often lead them to overtrain and the result is often injury. But when making a $200 race prize can change your life, the temptation to overtrain is understandably tempting.

In the same regard, ignoring possible genetic factors would not allow for a full picture. Even though no genetic traits have been identified that can conclusively explain the unique success of East African runners, researchers affirm that skeletal-muscle-fiber characteristics, hematological advantages and ectomorhpic somatypes most likely factor into the success of these runners (Wilber &Pitsiladis, 2008). But genetic factors cannot be isolated as the sole means of success, as this would disregard the intense training programs that East Africans are famous for (Noakes, 2001). In reality, exceptional running performance is probably a combination of psychological, training and biomechanical and physiological factors. But all of these factors can be traced back in some degree to the exposure of unique cultural practices and decision to live in an environment that nurtures elite endurance performance. Youth sport, diet, geographical setting, economic opportunity, training practices, and tradition all play an important role in the construction of middle- and long-distance running champions.

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