



Athletic prowess: Heredity or training?

Have you ever wondered what it takes to become an Olympic caliber athlete?

Good coaching, dedication, and rigorous long-term training are often cited as primary reasons for athletic success; yet, there is increasing evidence that other factors are even more important.

The recent Olympic Games prompted me to re-examine the age-old question, "To what extent does natural endowment or heredity contribute to superb athletic performance?"

Certainly numerous physiologic and psychosocial factors contribute to the Olympic athletes' performance capacity.

For example, elite distance runners are able to consume large amounts of oxygen during exercise — an important determinant of success in endurance events. However, research indicates that as much as 80 to 90 percent of this capacity is genetically determined, with the remainder attributed to differences in training.

OTHER STUDIES suggest that the athlete's success is largely dependent upon the relative proportion of slow or fast twitch muscle fibers that he or she is born with. Slow twitch muscle fibers are better adapted to support sustained body movement over a prolonged duration.

Fast twitch fibers are well-suited for physical activities requiring brief powerful bursts of effort. Although everyone has both types of muscle fibers, some people are born with a predominance of one over the other.

It is not surprising, therefore, that champion distance runners have an extremely high percentage of slow twitch muscle fibers. On the other hand, world class sprinters possess a high proportion of fast twitch muscle fibers.

Unfortunately, even the most rigorous athletic training programs cannot alter an individual's relative amount of slow or fast twitch muscle fibers. Thus, persons lacking the appropriate skeletal

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tal musculature may never become world class athletes, regardless of how dedicated they are to training.

Coaches have long suspected that heredity is more important than physical conditioning in producing an athlete with a superb performance capacity. As a result, young athletes, particularly those in some foreign countries, are often subjected to extensive physiologic

testing with the expectation of identifying those who will have the greatest potential for becoming champions.

An internationally known exercise physiologist was recently asked what he felt was the single most important factor that contributes to athletic success. "Pick your parents very carefully," he responded.

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