Inferiority: Comparisons of Performance

World Record Holders

Is the performance of women inferior to that of men? It depends on the terms of comparison: Who and what are being compared? First let us compare highly trained athletes who have approached the limits of their physical abilities. In addition, let us choose a holistic, product-based method, developed for use in comparing male weight lifters, that allows each athlete to be compared on his (or her) own terms. That is, we will compare pound for pound, or in the case of running and swimming, inch for inch. The key feature is the conversion of fixed race distances into units of competitor height. Then relative velocity is calculated by dividing distance in heights by elapsed time. (See box on page 148 for an example.)

Now we can answer the question: Who is the world's fastest human? Traditionally this title has gone to the world record holder of the men's 100-meter dash. Using our inch-for-inch method of comparison, we see that Carl Lewis, who stands 6'2" tall (Seoul ***Olympian Entries, 1988)*** and holds the men's world record of 9.92 seconds (Hoffman, 1990), has a relative velocity of 5.36 heights per second. But is he faster than the women's world record holder? Florence Griffith-Joyner, who stands 5'6-1/2" tall and runs the 100-meter dash in 10.49 seconds, has a relative velocity of 5.64 heights/second. In other words, the fastest woman is 5.3% faster than the fastest man!

While we acclaim "Flo Jo" as the world's fastest human, we should acknowledge that

What Is Your Velocity in Heights/Second?

Suppose you stand 1.67 meters (5'5-3/4'') tall and run the 10K in 50 minutes (3,000 seconds).

1. Convert the length of race to heights by dividing race length by height:

   10,000 meters/1.67 meters = 6,000 heights

2. Compute velocity by dividing heights by time:

   6,000 heights/3,000 seconds = 2 heights/second

women may have an inherent advantage in running events: Success in running depends on a strong lower body, and women are relatively strong in the hip and leg muscles (Wilmore, 1974). Part of this strength may result from the relative sturdiness of women. For example, women sprinters in the 1976 Olympics had 6% wider pelves than their male counterparts when width was expressed as a percentage of height (Carter, 1982).

Because men have relatively wider shoulders, perhaps they would fare better in an upper-body event such as swimming. Let us compare Janet Evans, the 5'5" (Seoul *Olympian Entries, 1988)* world record holder with 15:52.1 min (Hoffman, 1990) in the 1,500-meter freestyle, with Vladimir Salnikov, the 5'11" men's record holder with 14:54.76 min. Evans' velocity is .949 heights per second and Salnikov's is.926 heights/sec, a difference of 2.5% in favor of Evans.

The preceding comparisons are based on strenuous individual events that test the limits of upper- and lower-body musculature as well as the limits of power and stamina. The comparators are talented and tirelessly trained world champions. When measurements are made in absolute, dingnagian terms, the males are faster. However, when measurements are made from the context (i.e., size) of the individual, the physical abilities of females appear to be equal (if not superior) to those of males. Inferiority? It's mostly a matter of metric.

Olympians

What happens when the base of comparison is broadened? When the 57 women and 70 men who swam the 100-meter freestyle in the 1988 Olympics were compared inch for inch, the men were 2.1% faster (Kennedy, Brown, Chengalur, & Nelson, 1990). This difference appears to support the hypothesis that swimming, because it is an upper-body sport, favors men. However, other characteristics of the contestants deserve mention: Age was significantly related to velocity, and the men were 2.8 years older. Might the women reduce the velocity differential with 2.8 more years of training? Also, given that these swimmers represented a minimum of 29 countries, parity in preparation for women and men was unlikely. Although parity may be a fact in some of these countries, parity is not even a fiction in most. Otherwise, why did 10 different men from 7 countries of western Europe win medals in swimming while western European women won one? Moreover, this lack of parity is not unique to swimming. Consider the fact that Kenyan men won 17% of the track and field medals while Kenyan women won none (Siegman, 1989).

In sum, the abilities of elite women and men appear to be similar. However, there may be an interaction between gender and excellence. That is, when world champions are compared, the women are slightly faster, but when all Olympians are compared, the women are slightly slower. What could account for this interaction? What separates champions from challengers that might function differentially for women? If we assume that (a) champions have invested extreme effort, perhaps by training longer and/or harder than their competitors, and (b) the difference in effort between women champions and challengers is greater than the difference in effort between men champions and challengers, we have an explanation for the interaction: effort.

Young Adults

Does the similarity between elite women and men hold for nonelite women and men? No; there is once again a gender-excellence interaction: The difference between excellent and average women is larger than the difference between excellent and average men; and the difference between average women and men is larger than the difference between excellent women and men. For example, the average 18-year-old woman needs 10 min and 51 sec to run a mile (Ross, Dotson, Gilbert, & Katz, 1985), whereas the women’s world record holder needs just 39% of that time (4:15) (Hoffman, 1990). By contrast, the male champion completes the mile in about half (49%) the time taken by the average 18-year-old man (7:35). Therefore, it appears that young adult women may be farther from their athletic potential than their male counterparts. Again, effort may be the explanation.

Children

If young adult women have relatively unactualized potential, one might ask at what age this develops. Based on an inch-for-inch comparison of fitness norms for 6- to 14-year-old children (Hoffman, 1990; Ross et al., 1985; Ross, Pate, Delpy, Gold, & Svilar, 1987), 6-year-old girls were 3.5% slower in distance running than year-old boys. And the gap did not close: With astounding predictability the girls fell another 2.7% behind each subsequent year. Moreover, about half of the year-to-year change in performance was attributable to the boys improving; the other half resulted from the girls getting worse (see Figure 9.1).

By what mechanism did the boys get better: Was it a decrease in fat, an increase in cardiovascular fitness, an effective modification in technique? More important, by what mechanism did the girls get worse: increase in fat, decrease in cardiovascular fitness, ineffective modification in technique? Of course, these questions cannot be answered with cross-sectional fitness data, but the following point is worth noting: Although the girls had slightly thicker skinfolds than the boys at age 6, both groups gained fat at about the same rate between the ages of 6 and 12 (Ross et al., 1985; Ross et al., 1987). Thus the simple effect of fatness

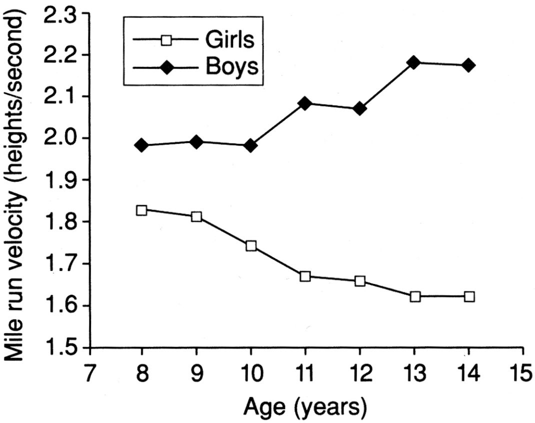

Figure 9.1 Divergence of fiftieth percentile girls and boys in running velocity between ages 8 and 14. The velocity-age correlation is -.964 for girls and .929 for boys.

does not appear to account for the differences in performance. And, inasmuch as fatness and cardiovascular fitness are correlated, fitness does not appear to account for the differences. Are boys learning effective modifications in technique while girls are "learning" ineffective modifications?

Although the preceding analysis of fitness data was based primarily on 50th-percentile scores, similar conclusions could have been drawn for scores at the 10th to 90th percentiles. However, in the most extreme deciles, difference was somewhat attenuated. In the lowest 10%, boys approached the trend for girls; and in the highest 10%, girls approached the trend for boys (Ross et al., 1985; Ross et al., 1987). That is, excellent girls were similar to (but slightly slower than) excellent boys.

Summary of Product-Based Comparisons

Combining inch-for-inch data from children, young adults, Olympians, and world record holders, it appears that there is a gender-excellence interaction in performance with similarity associated with excellence (and effort). Also, from the fitness data in Figure 9.1, it appears that there is a gender-age interaction in performance with similarity associated with youth. In sum, similarity is connected with the young and the relentless.

If there were an inherent biological difference in performance due to sex, we would expect this difference to become exaggerated with effort (i.e., men have a greater capacity that can be developed into excellence; women have a lesser capacity that defies development). And we would expect this difference to become manifest at the time of puberty (i.e., when divergence of secondary sexual characteristics is thought to occur). However, similarity rather than difference is associated with excellence, and the great divide in performance has become entrenched several years before puberty. Thus observed differences in performance do not appear to be explainable in terms of inherent biological inferiority. Rather, these differences can be explained in terms of effort: People who expend meaningful effort improve and perhaps become excellent; people who do not expend meaningful effort can expect to deteriorate in performance and remain estranged from ability. If girls and women believe they do not have the capacity of boys and men, then they do not realize *mentally* their physical abilities. If girls and women do not expend meaningful effort to develop their capacity, then they do not realize *bodily* their physical abilities.

Analysis of Refined Biomechanical Measures

Positing that highly trained women and men are similar on holistic, product-based variables, are they similar or dissimilar on more "refined" biomechanical measures? One of the variables that has drawn recurrent attention in sports biomechanics is the use of stored elastic energy