GRADING OF SPORTING EVENTS BY SIZE

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ABSTRACT

Data are presented showing that at the Mexico Olympics the outcome of most events could be prejudged in favour of the taller competitors, who themselves represent a minor proportion of the general population. It is suggested that, in order to encourage the widest participation by the community in sport, grading of competitors by size be introduced into all sports.

Introduction

In an earlier paper (Khosla, 1968) it was shown that some olympic events are seriously biased in favour of the taller competitors. In a subsequent paper (Khosla, 1970) the complex interrelationships between height, heredity, weight, obesity, physical fitness, smoking habits and health were explored. Many desirable attributes are associated with sporting activities; it is therefore improper to consider them in isolation divorced from other concomitant variables. On the basis of these studies it was felt necessary to suggest a system of grading based on height in some of the 'unsporting events' to provide a reasonable incentive to enthusiasts of average or less than average height. This would clearly encourage greater participation in the sporting activities of every country. Basically there is nothing new in this suggestion. In a few Olympic events (boxing, wrestling, judo and weightlifting) contestants are matched on strict weight standards and as recently as 1968 a new class was introduced in weightlifting. There is no official recognition of any form of advantage in other olympic events although it is realised by trainers that tallness is one of the necessary attributes in a successful athlete. Scientific evidence of advantage in some specific events was provided by Page (in rowing), by Pickering and Lindsay (in throwing events) and by Owen (in many other events) based on data of Mexico Olympic participants and winners. The reader is referred to their papers in the proceedings of British Association of Sports Medicine (published in the official Journal, 1970).

The subject of grading in sport is charged with emotion. Thomson (1959) on a different but not unrelated subject (Maternal Stature and Reproductive Efficiency) observed 'Experience has shown that many epidemiological truths have the property of arousing emotion. Medical journals have been enlivened by the resistance of a Fellow of the Royal Society to the idea that cigarette smoking causes lung cancer. The addition of fluorides to drinking water not only helps to prevent dental caries but also arouses violent controversy, and has caused the fall of at least one local government in

England'.

Results

The analysis is based on the height measurements recorded in the official handbook of 'Participants to the XIX Olympiad, Mexico 1968'. Figure 1 gives the cut off points to represent the quartiles of height distribution in young males aged 18 - 24 years based on a random sample in the United States (Stoudt, Damon, McFarland, Roberts, 1965). The height distribution in the United States is taken as 'control' for purposes of comparison with the height distribution of participants in each of the several events.

Figure 1

DISTRIBUTION OF HEIGHT AND QUARTILES U.S.A. MALES AGED 18-24 YEARS

Under the hypothesis of no association between stature and athletic events, 25 per cent of participants are expected to be drawn from each quartile of height distribution marked in Figure 1. It must be noted that

height varies between nations and young men from the United States considered as 'controls' form on average one of the tallest groups in the world. The olympic participants on the other hand are drawn mostly from nations shorter than the control. The assumption of an expected frequency of 25 percent in the lower quartiles (under the null hypothesis) is therefore an underestimate.

The observed trends displayed in Table I are contrary to expectations. This table gives the observed distribution of height within the expected quartiles in each of the five short and medium distance running events. For example, although of the 78 participants in the 100 m. event 15.4 percent are observed to fall in the 1st quartile of height, the two champions (Gold and Silver Medallists) are in the 4th Quartile and the bronze medallist is in the 2nd quartile. In the 400 m. event almost 50 percent of participants are drawn from the 4th quartile and all three medallists are amongst them.

Table I

PER CENT EXPECTED AND OBSERVED IN SOME EVENTS (MEXICO 1968)

Expected	% Within Quartiles				TOTAL
	1st 25	2nd 25	3rd 25	4th 25	
Observed					
100 m.	15.4	33.3(B)	29.5	21.8(GS)	100(78)*
200 m.	17.1	21.4	27.2(S)	34.3(GB)	100(70)
400 m.	12.3	12.3	26.3	49.1(GSB)	100(57)
800 m.	5.9	17.6(B)	23.6(S)	52.9(G)	100(51)
1500 m.	9.7	21.0	27.4(G)	41.9(SB)	100(62)

* Nos. of Participants

G:— Gold S:— Silver B:— Bronze

Figure 2 gives the summary of the five events presented in Table 1 as multiple bar charts (% participants (P) and % points won (M)) within each quartile. Points are allotted as follows:— 3 points for Gold; 2 points for Silver; 1 point for Bronze. The total of 30 points (5 x 6) is taken as 100 percent in drawing the bar charts. The figure shows an increasing trend in (P) with the quartiles. No point is won by participants (M) representing the 1st quartile and 70 percent of the points are won by participants representing the 4th quartile.

Discussion

The bar charts on (P) and (M) show that participants and champions are drawn from progressively taller height groups. Figure 3 gives the summary of canoeing

Figure 2

SUMMARY OF EVENTS 100 m, 200 m, 400 m, 800 m and 1500 m.

Figure 3

SUMMARY OF CANOEING EVENTS MEXICO 1968 KAYAK AND CANADIAN SINGLES

events and shows that all the points are won by participants representing the 4th quartile. The other events* (swimming, hurdling, throwing) show similar trends. Team events (basketball, volleyball and waterpolo) are composed of participants mostly drawn from the 4th quartile.

The above findings demonstrate the extent an enthusiast of average height from the United States can identify himself in the image of a champion athlete. To him, championship is largely determined not in the field of performance but in his hereditary make-up over which he has little control.

** For conciseness, figures on other events are not published in the paper.*

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