What makes an Olympic rower?  A study into the best body type for rowing.

1. Introduction

We selected athletes to study and had a sample size of about 60 athletes all of which had rowing experience and had a decent level of rowing technique.

1.1. Weight

We asked ourselves what body type was the best fit for rowing. We went out寻求 tallest lightweight and lightweight athletes and asked for our results to graph. In order to see what body type was fastest we tested athletes over 500m and 200m and analyzed the results to find what body type was ideal for rowing. Unfortunately, most athletes couldn't release results as they were an international school college squads so we tested athletes in our club and other local clubs, some of which have represented Ireland and are high achievers at national level.

1.2. Height

After this we then took measurements of their height, overall height, lower body height, upper body height and arm length. The first step in our test was to remind our athletes of basic rowing technique. Each athlete ensured that they would work to their highest possible intensity.

1.3. Time

Then we took our athletes to complete a joint sprint on a concept a ergometer and we recorded their times. We also asked them for their most recent season time.

1.4. Analysis

Then we analyzed our results and developed conclusions from our results.

2. Data Collection

Once all of the data was collected we found the average time of the athletes performance in each group. We drew a graph to represent each group's average performance over both 500m and 1000m. The results below show, as the athletes get heavier their times decrease at a rapid rate up to the athletes in group 3 (105-109 kg). From group 4 onward the times continue to decrease but at a much lower rate. The 500m average time and the 1000m average times both decreased at similar rates as the athletes' heights increased. From this we can conclude that weight has an effect on an athlete's performance but the advantage of being heavier decreases as the athletes get heavier.

3. Discussion

Similar to weight we grouped the athletes into groups based on their height. We found the average time and speed time of each group and displayed it on a graph. We found that the effect of height is related to time decreased as the athletes got taller. Taller athletes performed better over the shorter distance but some shorter athletes were able to keep up with the taller athletes over the season. Athletes who were over 180cm performed better. If athletes were overweight for their height the advantage of being tall can sometimes be eliminated. We saw this over the season as well.

4. Conclusion and Recommendations

A pair piece is an aerodynamic piece where taller athletes have a strong advantage over shorter athletes. While a single piece is an aerodynamic piece where taller athletes have much less of an advantage over the shorter lighter athletes. In some cases the heavier athletes are disadvantaged. Heavier athletes don't have as good endurance as lighter athletes and sometimes struggle over long distances.

Lighter athletes generally have a better VO2 max than heavier athletes. This is similar to the difference in body shapes of rowers. Sprinting is anaerobic fitness while endurance or long distance rowing is aerobic fitness. We studied our athletes under the categories lightweight and heavyweight set out by ISFA. We found that although lightweight athletes had slower times than heavyweight athletes the difference is slight (time per gram) over 500m and 1000m which we called the lightweight. Lightweight athletes were 3% slower over 500m in comparison to pair, while the heavyweight athletes were 0.6% slower.

We measured the participants from the center of their shoulder to their middle knuckle to see if the length of their arms had an impact on their ability to row. What we thought was that if their arms were longer then it could mean they could achieve additional meters per stroke in different parts of the stroke such as the catch (the initial drive) and coming into backstrokes (the end of the stroke). Although German rower Lars Hertig, who competed in the London Olympic decided to change to heavyweight rowing simply because he was struggling to make the weight in order to compete. Lars now competes in heavyweight rowing. This proves that there isn't much of a difference in pace between the two categories.

Another example is this Irish athlete Shane O'Driscoll and Mark O'Donnovan who won the lightweight pair in the 2012 world championships. This is an Olympic event so they might decide to enter the lightweight pair event. The initial presumption might be that they wouldn't be fast enough simply because they weigh less than the heavyweight world championship winner Giuseppe Cernigliaro and Matteo Lodo from Italy. The Irish pair were only 5 seconds off the winning time and would have been in the top 5 fastest time in the category.

As a recommendation we could suggest that lightweight athletes can enter heavyweight events and continue to compete at a high level. If we were to continue the project we would like to see how athletes in each category would perform in a pair event.