The Differences Among Elite Level Cyclists in Relation to Their Specialty

Section I

Introduction to the Study

Introduction

Cycling can be broken down into three main specialties. Climbing, sprinting, and time trialing. What gives an edge to one specialty often is a drawback to another. Each of these specialties generally has very distinct characteristics which is why it is very rare for someone to excel at all three. I was curious to see just how different the general make-up of each type of rider henceforth the following analysis was conducted.

Statement of the Problem

The purpose of this study was to determine the differences among elite level cyclists in relation to their specialty.

Significance of the Study

There are three primary groups that may benefit from this study. The first group, consisting of recreational cyclists, may gain further insight on the characteristics of different cycling disciplines. Identifying which category that may fit into should they train accordingly. The second group that may benefit from this study are athletic researchers. They may gain insight and draw comparisons to their own research conducted. Finally. Data driven individuals may use these findings as a guide to publish conduct their own work.

Scope of the Study

This study was limited to elite level cyclist whose data was available to the public. Elite teams and riders often do not publish their Functional Threshold Power (FTP) or watts per kilogram (W/kg) as they believe it may give an advantage to competitors. For this study, cyclists were only used if they met one of two of the following criteria:

1. The riders FTP was made available by their team and or themselves.
2. An accurate prediction of the riders FTP was concluded through data released in accordance with their racing performance.

Methods of the Study

Sources of Data

Data for this study was collected through online research. Multiple websites and formulas were used to calculate different metrics such as FTP and W/Kg. Given that some of the parameters presented are estimates, we cannot draw conclusions on the ability of the listed riders. Most of the data presented is for select riders' current outputs. However, not all the data present is current. Chris Froome for example has data from 2015. To maintain consistency, riders' weights and ages were taken from when their FTP data was released.

Sample Selection

The cyclist involved in this study were not randomly selected. Given the limited information about certain metrics, the first 89 elite cyclist of which I could find their FTP's for were used. Due to the selection process not being random, there may be some bias in the results.

Statistical Methods

[Maybe add a section]

Limitations of the Study

This study may be limited by the available data on elite cyclists. Due to riders FTP typically being a secret, very little data can be collected. If FTP were a given variable, we could conduct a study of over 1,000 cyclists who are randomly selected. This would diminish the possibility of any bias occurring.

Section II

Findings, Conclusions, and Recommendations

Introduction

This study was designed to determine the differences among elite level cyclists in relation to their specialty. Data was collected through internet research with a total of 89 cyclists. This is less than 2% of the total number of elite male riders as of 2020. This section includes the Findings, Conclusions, and Recommendations.

Findings

Demographic Profile

The cyclist in the sample all had their age taken from when their FTP data was taken. The age ranges are represented in the results shown in Figure 1. The breakdown consists of 5.6% between 21 and 23, 25.8% between 24 and 26, 21.4% between 27-29, 28.1% between 30-32, 12.4% between 33 and 35, 5.6% between 36 and 48, and 1.1% between 42 and 44.

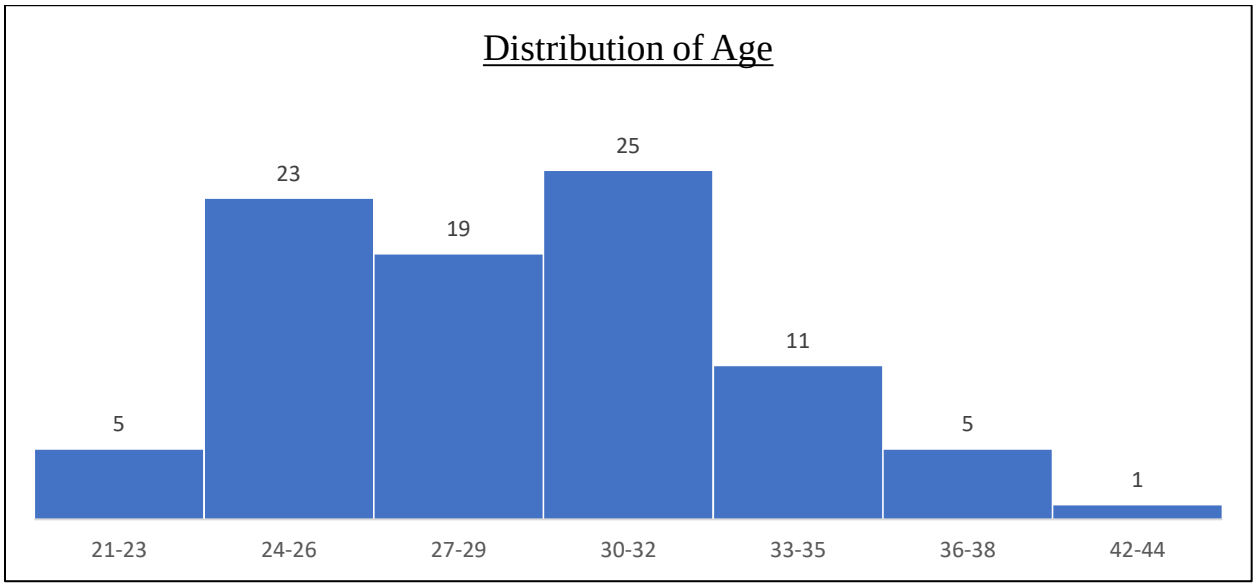

Figure 1: Age Distribution of Sample Group

Demographic of Functional Threshold Power

As shown in Figure 2, the distribution of riders age in correlation with their FTP demonstrates that elite riders generally have a higher FTP when they are between 24 and 26 years old. I believe this assumption can be further strengthened as the sample size of 24-26 is 23 which is greater than n=5. We also see a trend of decreasing FTP as a rider ages, followed by an increase once they reach 33 and again at 36. An assumption I am willing to make is that if more data were collected, the trend of continual decreases in FTP as an elite level cyclist whose age is greater than 26 would remain consistent. It is also worth noting that the 42-44 demographic has the highest FTP, but there is a strong possibility of bias as there was only 1 sample point. It is very unlikely for professional cyclists to continue their career into their 40's.

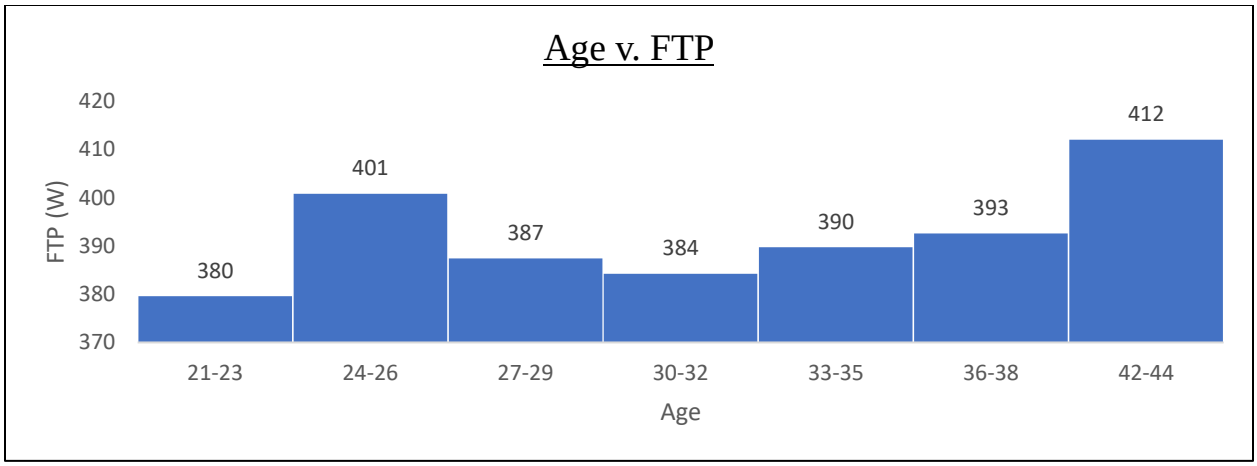

Figure 2: Age in Relation to FTP

Effects of Height and Weight on FTP

In Figure 3 we see a positive correlation between an elite rider's height and their FTP. Figure 4 shows a similar positive correlation between an elite rider's weight and their FTP. Both these trends fall in line with general assumptions as any persons height and weight have strong correlations to one another.

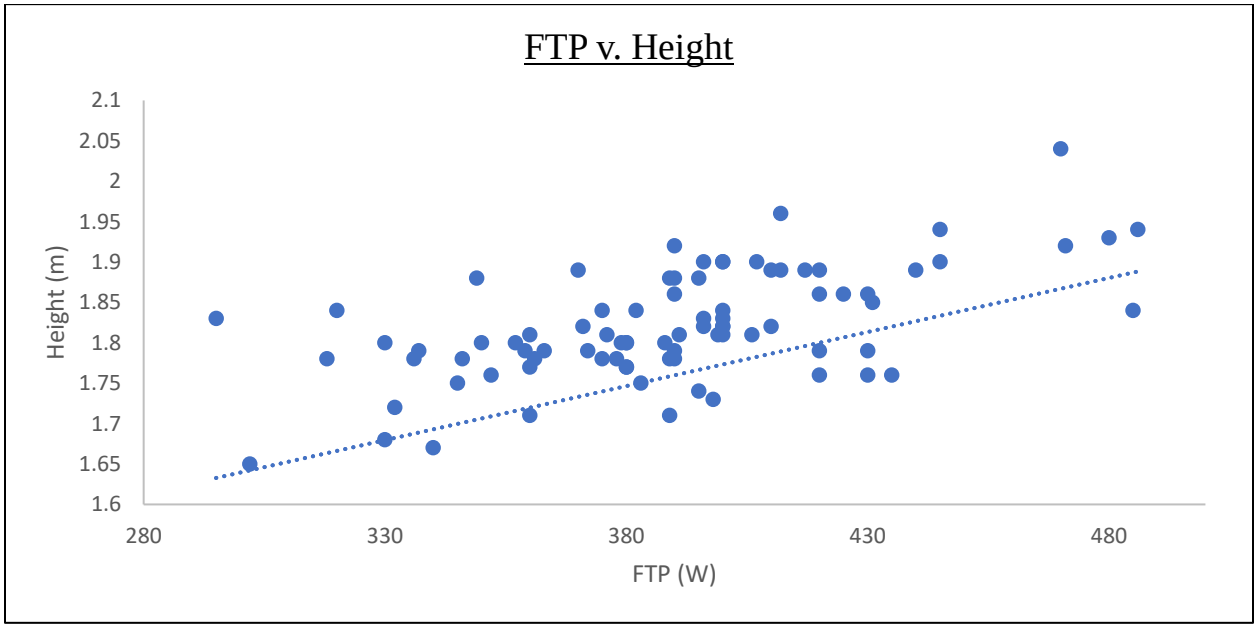

Figure 3: Distribution of FTP in Relation to Height

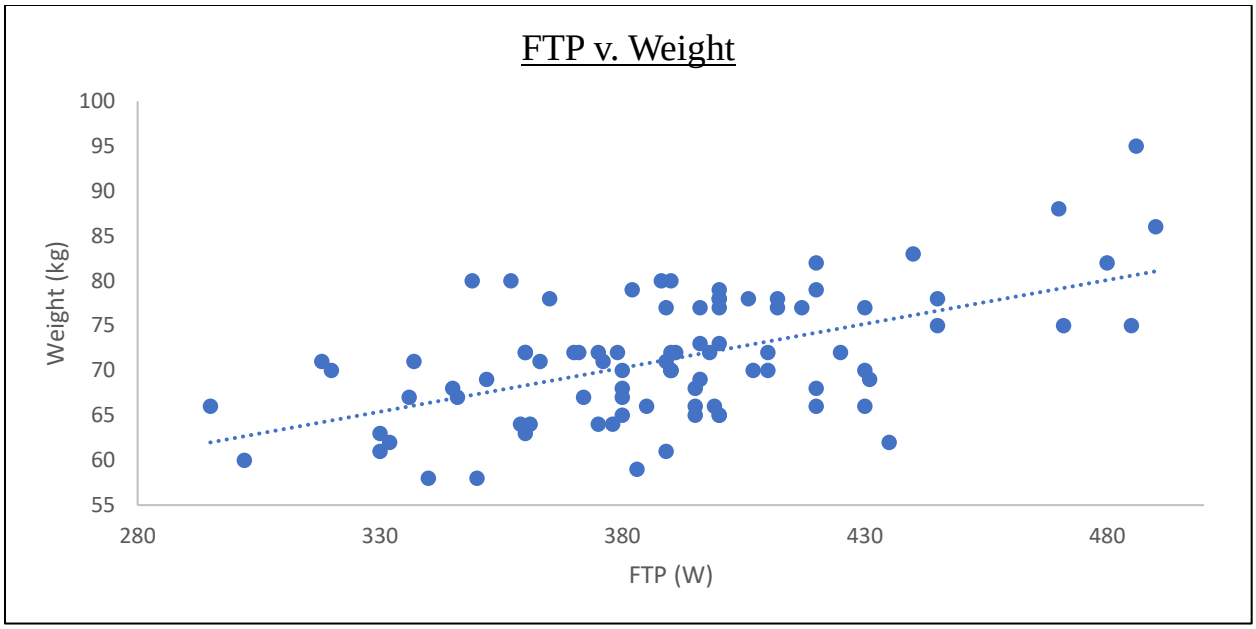

Figure 4: Distribution of FTP in Relation to Weight

Data Broken Down into Specialties

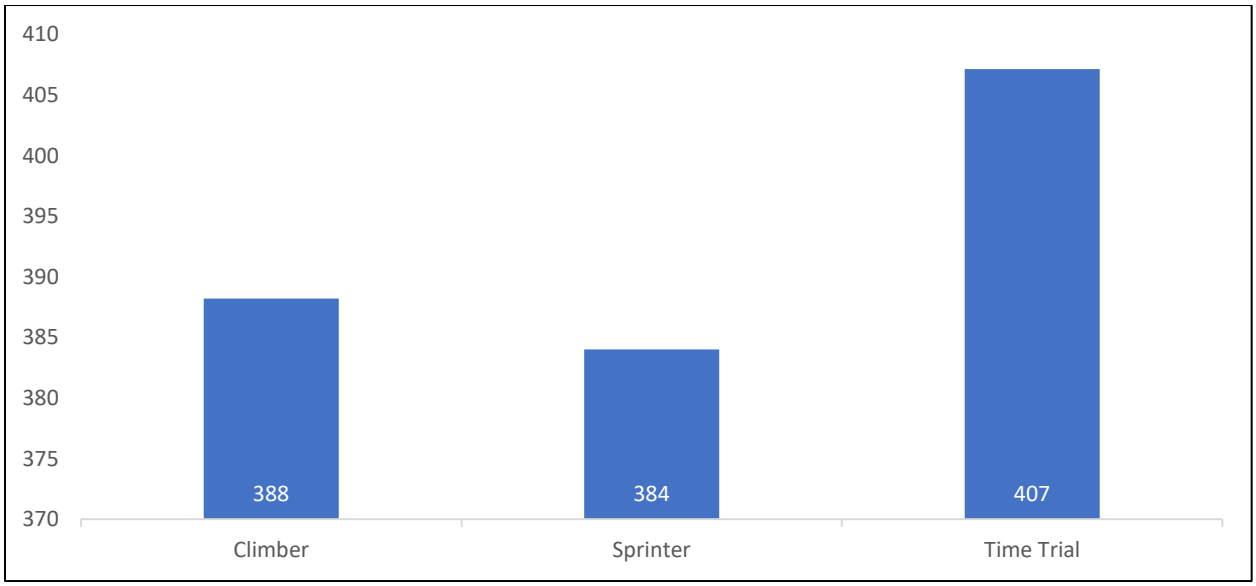

Figure 5: Average FTP in Relation to Specialty

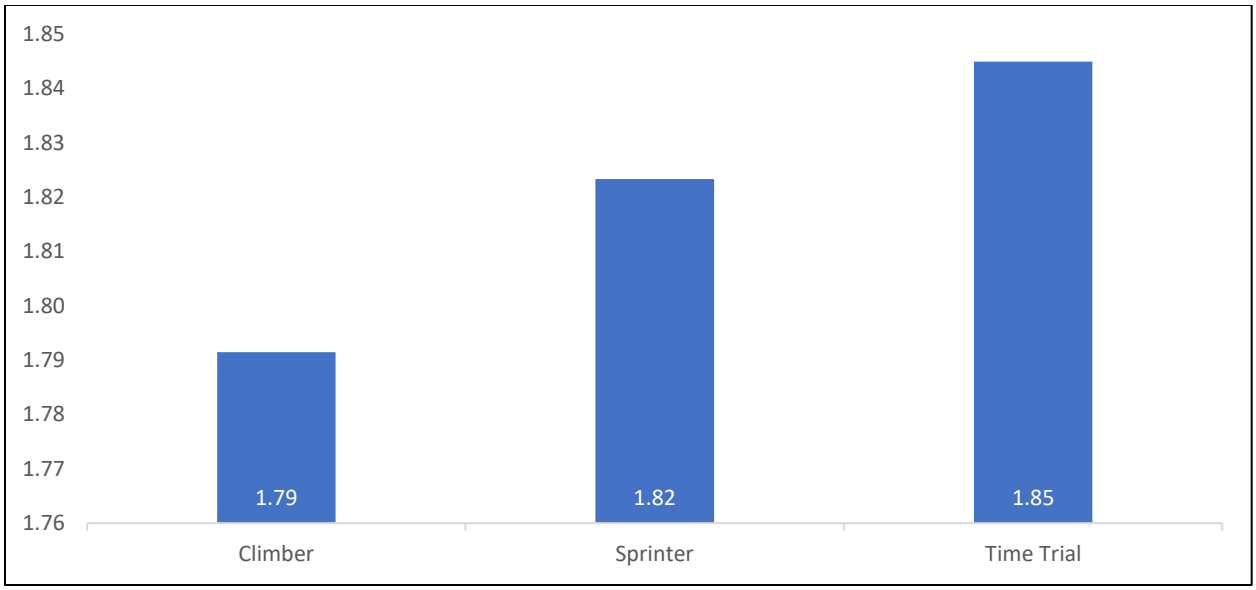

Figure 6: Average Height in Relation to Specialty

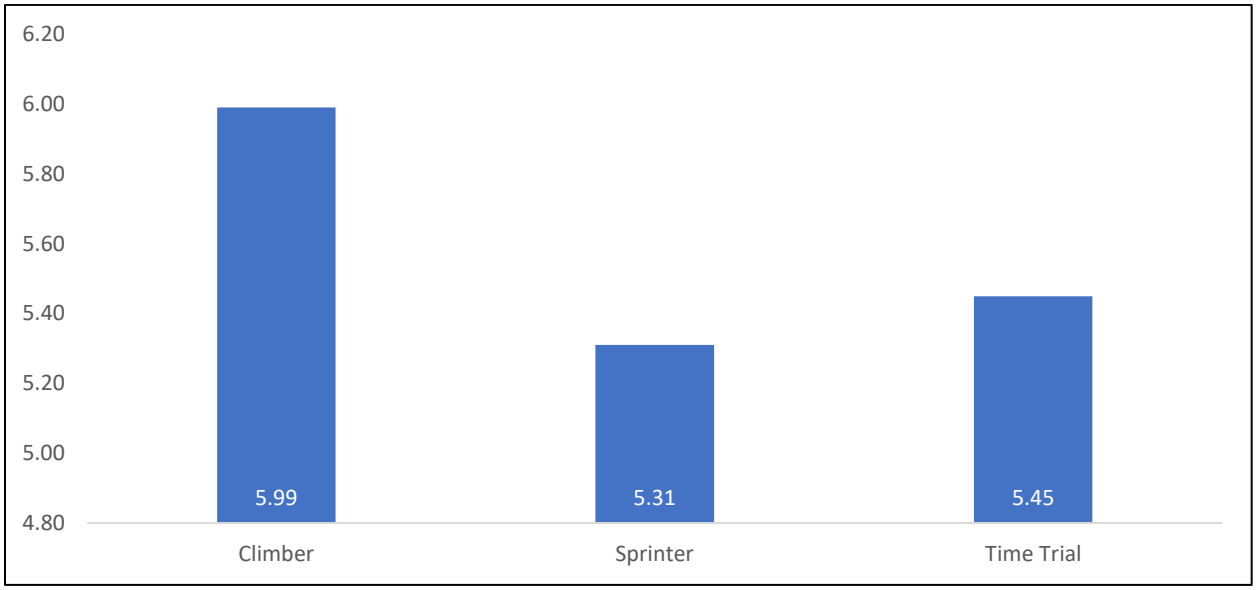

Figure 7: Average W/kg in Relation to Specialty

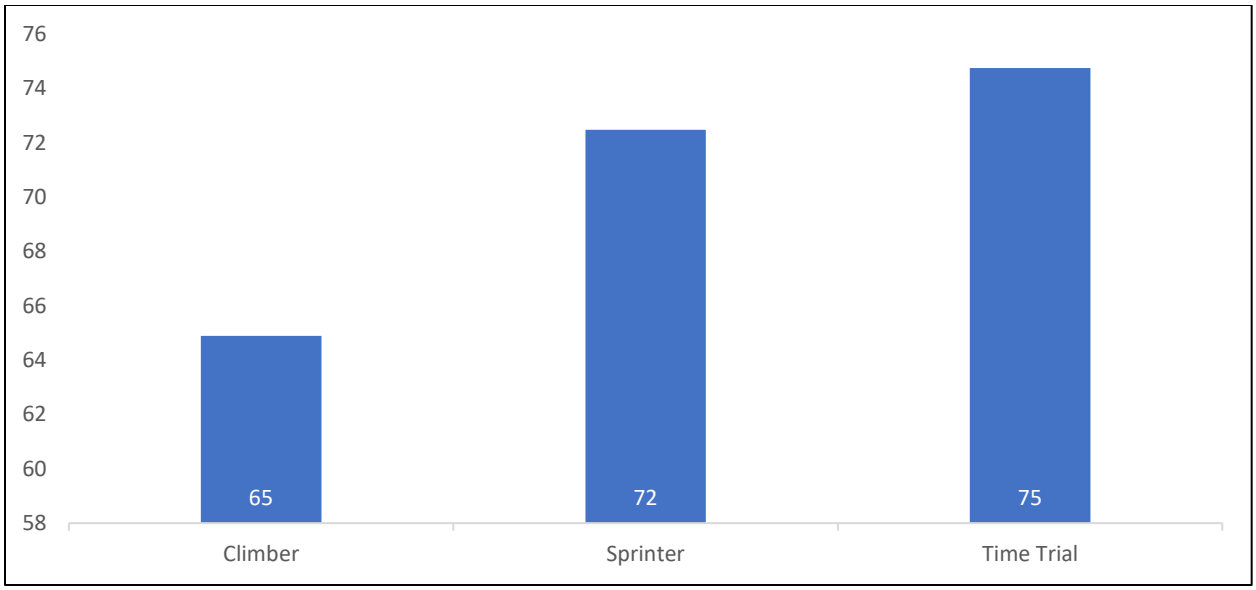

Figure 8: Average Weight in Relation to Specialty