Chapter 1
Introduction

1.1 A Brief History of Triathlon

Although Triathlon traces its earliest roots to a 1920s event in France, the first recorded triathlon event of the modern era was directed and conceived by Jack Johnstone and Don Shanahan and took place on Wednesday the 25th of September in 1973. The Mission Bay Triathlon took place at the causeway to Fiesta Island in California at 5.45pm where 46 competitors set off on the first triathlon event comprising of 6 miles of running (the longest continuous stretch was 2.8 miles), 5 miles of bicycle riding (all at once), and 500 yards of swimming (the longest continuous stretch was 250 yards). All forty six competitors finished and a new sport was born. From humble beginnings, triathlon is now one of the world’s fastest growing, diverse and environmentally friendly sports. In Ireland alone, the governing body, Triathlon Ireland, has in excess of 1700 members. The modern day triathlon differs somewhat from its early beginnings and is now a unique endurance sport that comprises a sequential swim, swim-to-cycle transition, cycle, cycle-to-run transition, run and takes place over a variety of ‘long’ or ‘short’ distances.

While triathlon events come in all shapes and sizes, the five most common distances are the sprint distance, the standard or Olympic distance, the half Ironman® distance, the ITU Long Distance triathlon and of course the distance that many people associate with the sport of triathlon, the full Ironman®. The distances associated with each of these events are detailed in Table 1.
Since triathlon became an Olympic sport in 2000, it has seen explosive growth. USA Triathlon, the sport's governing body in the United States, sanctioned 1,820 races in 2005, up from an estimated 400 in 1999 (Gunn, 2006) and Membership of USA Triathlon has increased from 21,341 in 2000 to 84,787 in 2006 (Los Angeles Times, 4th February 2008).

1.2 The Great Debate

A common area of debate in the triathlon fraternity is which sporting background is most advantageous to an athlete entering the sport of triathlon for the first time, most particularly swimming, cycling or running background. This extended right back to the very first triathlon. Jack Johnson had been a high school and college swimmer who took up running in the jogging craze of the early 1970s. He was planning to organise a biathlon event after competing in the Dave Pain Birthday Biathlon consisting of a 4.5 mile run followed by what was billed as a quarter-mile swim. He planned an event to take advantage of his own swimming background by organising a similar event with a longer swim. It was only when he consulted with Don Shanahan that the idea of a bike leg was included which by his own admission Jack Johnson was not too happy with as he had never cycled competitively. Even the event which comes to mind for the majority of people when they hear the
word triathlon, the Ironman® triathlon, came about in an effort to determine whether swimmers, cyclists or runners held the edge in overall fitness. U.S. Navy Commander John Collins, stationed in Hawaii suggested that the debate should be settled through a race combining the three existing long-distance competitions already on the island of Oahu: the Waikiki Roughwater Swim (2.4 mi./3.862 km), the Around-Oahu Bike Race (115 miles; originally a two-day event) and the Honolulu Marathon (26.219 mi./42.195 km). Ironically, the first Ironman® Champion, Gordon Haller, had a background in all three events. Several years before the idea for the Ironman® was born, Haller arranged his work schedule to allow him about eighty hours a week off. This time was spent “challenging” his fitness. In an interview with “Active.com” to celebrate 25 years of the Ironman®, he said, "During the 80 hours off, I'd pretty much do an Ironman on the first and third days and rest the day between. I'd get up and run 10 miles or so in the morning, ride (the bike) 100 miles, come back, take a nap and grab a snack. Then I'd go hang out by the pool, swim a couple thousand meters, and then I'd usually go out and run another 10, 15 miles.” So the debate rages on, which athletes have the advantage?

1.3 Literature Review

For such a hotly contested topic, it is surprising how little research has been done in the scientific arena in this area. The work of Baker, Côté and Deakin (2005) did look at the sporting background of triathletes competing in Ironman® distance events. In their study, they took twenty-eight ultra endurance triathletes and separated them into expert, middle of the pack, and back of the pack groups based on previous finishing times. Baker et al (2005) found that the training regime of the expert triathlete was designed so that periods of high training stress were followed by periods of low stress. This demonstrates the fact that experts make use of periodisation in planning their training year. All participants in their study provided detailed information regarding their previous involvement in general sports and the three triathlon sports in particular through the means of interviews. Baker et al (2005) computed the number of hours participating in other sports prior to triathlon and compared
them between the individual groups. They did not find any significant differences among the groups in previous sport participation. The first of the triathlon sports to be embraced by all three groups was running with the Expert group taking up running at 14.3 years, while the Mid-pack and Back-pack athletes began at 19.7 and 23.2 years. Running was followed by the addition of swimming (mean starting age 18.4, 18.1, and 23.4 years for Experts, Mid-pack and Back-pack triathletes respectively), cycling (18.6, 21.3, and 26.7 years of age respectively). Baker et al (2005) also found that experts performed more training than non-experts but that performance level did not continue to increase with practice as had been suggested previously by Ericsson, Krampe and Romer (1993). Ericsson et al (1993) found that in most domains of expertise, a regime of “deliberate practice” designed to improve performance began in childhood. Individual differences, even among elite performers, were found to be closely related to the amount of “deliberate practice”. This led them to the conclusion that characteristics, which were previously believed to be a result of “innate” talent, are in fact the result of intense practice for a minimum of ten years. This need for specialized training during early stages of development, as advocated by the theory of deliberate practice was not supported by Baker et al (2005). This is clear from the ages at which the ultra endurance triathletes started running. They were not typically involved in regular training in swimming, cycling, or running until at least mid-adolescence. While Baker at al (2005) did not find any significant different in the sporting backgrounds of ultra endurance triathletes, the real significant difference between the groups was found to be the total hours spent in training. The differences between the elite and non elite ultra endurance athlete arose from both an earlier start age and a higher volume of training. Baker et al (2005) argued that while these findings do suggest early involvement in diversified sport participation as a background to entering triathlon, they also indicate that participation in other sports does not distinguish Expert from non-expert ultra endurance triathletes.

Schuylenbergh, Vanden Eynde and Hespel (2003) conducted an interesting study investigating whether or not sprint triathlon performance can be adequately predicted from laboratory tests. In their
study they used ten triathletes age 21.8±0.3 years, height 179±2 cm, body mass 67.5±2.5 kg. Each athlete performed two graded maximal exercise tests in random order, either on their own bicycle which was mounted on an ergometer or on a treadmill, to determine their peak oxygen consumption (\(\dot{\text{V}}\text{O}_2\text{peak}\)). They also participated in two to three 30-min constant-load tests in swimming, cycling and running to establish their maximal lactate steady state in each exercise mode. They found that that running speed and swimming speed at maximal lactate steady state (MLSS), together with blood lactate concentration in running at MLSS, yielded the best prediction of performance. However Dabney and Butler (2006) examined the predictive ability of two \(\dot{\text{V}}\text{O}_2\text{max}\) tests (the YMCA Cycle Test and the Bruce Protocol Treadmill Test) on a group of triathletes. Within their study, they also examined the effect of different training backgrounds of triathletes (emphasizing either cycling, running, or swimming) on the predictive ability of the tests. Their intention was to compare the validity of the two tests for athletes coming from different sporting backgrounds. They took fourteen triathletes from ages 14 to 21 and their training backgrounds included 2 athletes from a swimming background, 3 from a cycling background, and 9 from a running background. They found that while both of the sub-max tests appear to underestimate the actual \(\dot{\text{V}}\text{O}_2\text{max}\) (as measured by the Max test), the YMCA test produced the better estimate of \(\dot{\text{V}}\text{O}_2\text{max}\) for those with a cycling background while for those with a running background, the Bruce test produced a better estimate of \(\dot{\text{V}}\text{O}_2\text{max}\). The mean percent error of the estimates for the cyclists was 1.26% on the YMCA test compared to 11.60% on the Bruce test. Conversely, the mean percent error for the runners was 15.40% on the Bruce test compared to 19.02% on the YMCA test. The swimmers showed some of the largest percent errors with 25.89% on the YMCA test and 14.63% on the Bruce test. The small sample size of this study should be acknowledged as a weakness, but nonetheless, it gives rise to the question whether or not the findings of Schuylenbergh et al. (2003) were influenced by sporting background. Did run and swim speed provide the more accurate indicators because the majority of the triathletes participating in the study came from either a swimming or a running background?
If there is no significant difference in performance and sporting background what is it that gives the athlete their edge apart from genetic gifts? Perhaps it is supplementary training such as resistance training? Laursen, Chiswell and Callaghan (2005) found that although research is limited concerning the influence that resistance training has on endurance performance, findings suggest that resistance training may improve endurance performance in runners through improvements in “economy of motion” without influencing either VO2max or the lactate threshold. Laursen et al (2005) believe that the running economy is augmented through neuromuscular adaptations including a reduced time of the “stretch-shortening cycle mechanism” or an increase in muscle stiffness. However, the same study also concede that resistance training has yet to show improvements in cycle performance but suggest that further study with this population is required. But they point out that resistance training has never been shown to have a negative influence on endurance performance. Therefore, it would suggest that it may be beneficial to triathletes.

1.4 Focus and Goal of this Dissertation

The existing literature reviewing the sporting background of triathletes focuses exclusively on ultra endurance athletes competing in Ironman® events. The two triathlon distances that were focused on in this dissertation were the standard sprint distance as defined by the International Triathlon Union (ITU), comprising of a 750m swim, a 20km cycle and a 5km run and the Olympic Distance defined by the International Olympic Committee (IOC) as a 1500m Swim, 40km Cycle and 10km run. As the name suggests, this is the distance featured in the Olympic Games where the sport of triathlon made its debut in Sydney in the year 2000. It should be noted, that this dissertation focused on age-group rather than elite events. This means that the non drafting format is in place for the cycle. The difference between elite and age-group races is that during the cycle stage elite competitors may ‘draft’ or cycle in a sheltered position, thereby gaining an advantage by using the athlete in front as a wind breaker, whereas age-group athletes complete the cycle stage as an individual time trial and will
be penalized should they be observed “drafting”. Elite athletes are defined as those holding an International Triathlon Union (ITU) world ranking of <125 so it is unlikely that any “elite” athletes completed this survey. “Age Group” Triathletes may compete in 5-year age categories at a World Championship level, but not against the elite competitors. The goal of this dissertation is to establish what sporting background do age group triathletes come to the sport of triathlon from and if a particular sporting background results in faster finishing times. It will also examine the impact of training hours, periodisation and strength training on finishing times. Sporting background will be given further attention by comparing athletes who have been categorised as high performance with regular athletes in terms of the hours they spent at their peak on the primary sport from their sporting background, the age at which they started the sport and the number of years they’ve been involved in the sport. These three variables were correlated against finishing time to determine the relationship between the variables.