A M Luebbers III

Annual Training Patterns and Success in Ironman-Distance Triathletes

It's All About the Bike

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UNITED STATES SPORTS ACADEMY

CORRELATIONS BETWEEN ANNUAL TRAINING PATTERNS AND RACE PERFORMANCE IN MALE, NON-ELITE, IRONMAN-DISTANCE TRIATHLETES

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submitted for fulfillment of the requirements for the degree of
Master of Sport Science
in
Sport Coaching

By
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Okinawa, Japan

Abstract

Male, English-speaking non-elite, ironman-distance triathletes were surveyed using an on-line questionnaire for descriptive characteristics, race history, and training history. Useable results from 39 individuals were then sorted into high, mid, or low success groups by their race time or their race place by age-group (n=39, age 35.0±5.9 y). Training patterns for a 12-month period, based on training distance or training hours in swimming, bicycling, and running, were generated for each group. There were observed differences between group patterns, the most outstanding being the high success group showing greater distances of bike training, which is consistent with other study's findings. A suggested annual training volume pattern for ironman-distance triathletes was proposed based on the common training volume pattern elements used by the high success group triathletes sampled in this study.

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CHAPTER I

INTRODUCTION

Endurance sports encompass a variety of activities and athletes. Swimming, bicycling, and running are three separate activities that can be contested at distances long enough to make each of them endurance events. Athletes have taken swimming, cycling, and running, combined them into one competitive event, and named that event a triathlon (International Triathlon Union, 2003a; Johnstone, n.d.). Triathlons are held all over the world, at all levels of competition, including the Summer Olympic Games (International Triathlon Union, 2003a, 2003b).

There are different race distances contested within a triathlon, from short, sprint-distance triathlons, through very long, multiple-day ultra-endurance stage races. There are at least three widely accepted, commonly used triathlon events with standard distances of swim, bike, and run segments. An Olympic-distance race is comprised of distances of 1.5 km of swimming, 40 km of cycling, and 10 km of running (International Triathlon Union, 2003b). A one-half ironman-distance race has a 1.9 km swim, a 90 km bike, and a 21.1 km run (Ironmanlive 2003a). The full ironman-distance race is a 3.8 km swim, a 180.2 km bike, and a 42.2 km run (Mione, 2004).

Of these three, the ironman-distance triathlon, due to the length of each of its race segments, may require a high level of endurance-based fitness. Also of note are other long-distance triathlons, held all over the world, that are slightly shorter or slightly longer than official ironman-distance triathlons. The International Triathlon Federation (2003c) rules state that the minimum distances for a long-distance triathlon are a 3.8 km swim, a 120 km bike, and a 30 km run. These races are so close in distance to the official ironman-distances that they are sometimes considered equivalent races, often termed iron-distance races (Trifind, 2004).

All athletes, including those that take part in ironman-distance and equivalent races, have a variety of life and race experiences. The 2003 Ironman World Championship in Kailua-Kona,

Hawaii on 18 October included over 1,600 triathletes, from 18 to 80 years old, from almost 50 different nations (Ironmanlive, 2003b, 2003c; Mione, 2004). These racers qualified for the championship from among a larger group of 54,000 ironman-distance triathletes (Mione, 2004). These athletes took part in at least one of over 20 races held in 15 different countries (Ironmanlive, 2004a) or qualified through a lottery system or special invitation (2004b).

According to Mione (2004), the ironman-distance triathlete trains an average of 18 to 24 hr each week. This training breaks down to about 11.3 km of swimming, 373.3 km of bicycling, and 77.2 km of running (Mione, 2004). Triathletes might also perform supplemental training, like weight lifting, yoga, or stretching, as part of their workout regimen (Mione, 2004).

Triathletes could perform a variety of training to prepare for competing in a triathlon. Some of the elements of ironman-distance training (Ash & Warren, 2004; Bernhardt, 2000; Evans, 2003; Fitzgerald, 2003; Friel, 1998; Friel & Byrn, 2003; Hobson, Campbell, & Vickers, 2001; Jonas, 1999; Price, 2003; Ross, 2003; Sleamaker & Browning, 1996; St. John, 2001; Strauss, n.d., 2004a, 2004b; Svennson, 1998; Town & Kearney, 1994) include:

1. Endurance training work to increase the duration that a velocity can be sustained at a given physiological exertion level; to includes cardiovascular and muscular endurance training.

2. Strength training work to increase ability to deliver force at a given physiological exertion level; this allows an increase in the ability to increase speed, an increase in injury resistance, and aids in fatigue resistance.

3. Speed training work to increase the velocity at a given physiological exertion level and to increase economy at a given velocity level.

These elements could be practiced or developed in any or all of the three disciplines used in a triathlon (swimming, cycling, or running), or in combination workouts that include multiple disciplines within the same workout (swimming and cycling, cycling and running, etc.) (Ash &

Warren, 2004; Bernhardt, 2000; Evans, 2003; Fitzgerald, 2003; Friel, 1998; Friel & Byrn, 2003; Hobson, Campbell, & Vickers, 2001; Jonas, 1999; Price, 2003; Ross, 2003; Sleamaker & Browning, 1996; St. John, 2001; Svennson, 1998; Town & Kearney, 1994).

Athletes preparing for an ironman-distance event make training choices. Those choices include the type, duration, intensity, and frequency of their workouts. Individual ironman-distance triathletes could use dissimilar training and still be competitive with each other. Conversely, they might reach different levels of success or achievement even though they perform similar training. There could be many reasons why dissimilar training produces equally successful or unsuccessful results, why the same training could produce differing levels of success for different athletes, or why different athletes make training choices.

Factors that could influence an athlete's training, or the results of that training, include general and specific items. The triathlete could have limitations such as a missing or deformed limb, being confined to a wheelchair, or having other anatomical challenges. Their ability may be hindered due to a high body mass, an injury (current or past), or an illness. Medical conditions such as asthma, hypertension, or a predisposition for heat illnesses could affect training choices and performance results. Some additional characteristics that might play a part in an athlete's race performance could include general muscle composition, bone and muscle anatomical structure, height, physiological age, chronological age, training age, and current level of fitness.

There could be psychological or lifestyle elements that also affect training and results. Factors such as motivation, social influences, income, and available training time could all play a part in an athlete's ability to train. The athlete's experiences or personal history could also influence the training process; an athlete's level of success with past training choices could impact on future training decisions. If his or her background includes participation as a

swimmer, runner, or cyclist, they may have different learned skills, behaviors, or training patterns than someone without that same background. Similarly, if they have experiences with long duration races, they may have developed different notions or abilities than an athlete lacking those experiences. A particular ironman-distance triathlete's peer group could also be an influence on training choices.

The resources available could also influence an ironman-distance triathlete's training decisions. The athlete may have access to coaches, training facilities, or natural training sites (such as a lake or an ocean); they may live in an area that has year-round moderate weather conditions, allowing them to train outdoors almost anytime; or they could live in an area that has drastic seasonal changes, limiting their training opportunities.

This paper seeks to determine relationships among ironman-distance triathletes' training volume patterns and race results. It will try to answer the questions of what training volume pattern is followed by athletes when preparing for an ironman-distance race, and are there any similar or dissimilar trends in those patterns when athletes are grouped by their level of ironman-distance race success, with success measured by race finish time or race finish place.

Statement of the Problem

How can ironman-distance triathletes determine or plan an annual training volume pattern that will increase their chance of success at an ironman-distance triathlon? One way could be to make training plan choices based on those that tended to produce favorable results, as measured by level of success, in other athletes.

This research intends to define ironman-distance triathletes' training volume patterns in terms of time and distance, then look for trends between levels of success and training volume patterns. It intends to categorize training volume patterns by the athletes' level of success, identify training volume patterns used by athletes with high-success results in ironman-distance

events and, from a review of that grouped data, describe training volume patterns that might be used by ironman-distance triathletes to be more successful.

Research Questions

This paper seeks to answer the following questions:

1. Are there general training volume patterns that are similar among male non-elite ironman-distance triathletes?
2. Are these training volume patterns different when categorized by the athlete's achievement level?
3. What, if any, common training volume patterns do successful ironman-distance triathletes use?

Definition of Terms

The following definitions will be used in this paper:

Triathlon is a type of sport that includes three different disciplines within the same race, swimming, bicycling, and running. There are a variety of distances and orders of disciplines contested, but for this paper the order is swimming, then cycling, then running.

Triathlete is an athlete that takes part in triathlons. They may participate in other sports, but their main training and racing focus is triathlons.

Coach will be used to describe someone that assists an athlete in preparation for an event. The coach might be a full-time professional coach that designs and controls all aspects of the athlete's training plan, they might be a resource that assists with only part of a plan, or they might fall at any level of assistance in between. Any data gathered from coaches will be noted as such, and will be for background and reference use only. Coaches will also be take part in the early review process of the research instrument.

Ironman-distance is a specific type of triathlon with set lengths for each discipline of a 3.9 km swim, a 180.2 km bike, and a 42.2 km run. The term "Ironman" (capitalized, sometimes referred to as Ironman-branded) is a trademark of the World Triathlon Corporation and refers to specific races that have a licensing agreement with the World Triathlon Corporation. The term ironman-distance (lower case) refers to the distances to be performed in a specific triathlon of a 3.8 km swim, a 180.2 km bike, and a 42.2 km run.

Ironman-distance triathlete is a triathlete that is training for, or competes in, ironman-distance triathlons. They may also compete in other distances and other sports, but their primary training and racing focus is ironman-distance races.

Elite refers to an athlete that is registered as a professional or elite athlete with the sport's governing body, placing them in a different competitor category in ironman-distance events. This must be declared annually, and once declared the remaining race finishes for that calendar year are categorized among the elite field (USAT, 2003).

Age-group refers to an athlete that is not registered as a professional, placing them into competitor categories based on their age on the day of the race, usually divided into groups of 5-year increments, such as 18-24 years old, 25-29 years old, 30-34 years old, etc.

World championship-level describes an athlete that has qualified for the ironman-distance world championship race held each October in Kailua-Kona, Hawaii (also known as Ironman Hawaii or Kona Ironman). The athlete may or not actually compete in that world championship race. There are a small group of athletes that take part in the ironman-distance world championship race even though they have not qualified in a race during the current season. These athletes could be celebrity invitees, lottery entries, or other special entry cases. Also in the group of athletes that could compete in a particular year's world championship race is any past world championship overall winner, the previous year's champion in each age-group category,