Pacing Strategy of a Full Ironman Overall Female Winner on a Course with Major Elevation Changes

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Abstract:

The purpose of this study was to use a mixed-methods design to describe the pacing strategy of the overall female winner of a 226.3-km Ironman triathlon. During the race, the triathlete wore a global positioning system and heart rate (HR)-enabled watch and rode a bike outfitted with a power and cadence meter. High-frequency (every km) analyses of mean values, mean absolute percent error (MAPE), and normalized graded running pace and power (accounting for changes in elevation) were calculated. During the bike, velocity, power, cadence, and HR averaged 35.6 $km \cdot h^{-1}$, 199 W, 84 rpm, and 155 $b \cdot min^{-1}$, respectively, with minimal variation except for velocity (measurement unit variation [MAPE]: 7.4 $km \cdot h^{-1}$ [20.3%], 11.8 W [7.0%], 3.6 rpm [4.6%], 3 $b \cdot min^{-1}$ [2.3%], respectively). During the run, velocity and HR averaged 13.8 $km \cdot h^{-1}$ and 154 $b \cdot min^{-1}$, respectively, with velocity varying four-fold more than HR (MAPE: 4.8% vs. 1.2%). Accounting for elevation changes, power and running pace were less variable (raw [MAPE] vs. normalized [MAPE]: 199 [7.0%] vs. 204 W [2.7%]; 4:29 [4.8%] vs. 4:24 $min \cdot km^{-1}$ [3.6%], respectively). Consistent with her planned pre-race pacing strategy, the triathlete minimized fluctuations in HR and watts during the bike and run, whereas velocity varied with changes in elevation. This case report provides observational evidence supporting the utility of a pacing strategy that allows for an oscillating velocity that sustains a consistent physiological effort in full Ironman races.

Keywords: topography | exercise intensity | velocity | performance

Article:

Introduction

Full Ironman triathlons consist of consecutive swim (3.8 km), bike (180 km), and run (42.2 km) components lasting between 8 and 17 hours. Several factors affect full Ironman performance, including previous training, nutrition, hydration, body temperature, course topography, and environmental conditions among others. Energy distribution throughout the race or pacing strategy is also recognized as a deterministic factor affecting endurance performance ([1,13,17,22,38]).

The distribution of energy throughout exercise seems to be constantly regulated by a complex integration of information from external and internal cues ([1,12,26,34,38]) that are integrated consciously ([12]) and subconsciously ([26,34]). There is some agreement that pacing is inherently organized in an anticipatory manner purposed to consciously achieve optimal performance by consciously or subconsciously maintaining physiological systems within manageable (i.e., homeostatic) ranges ([34]). Although many factors influence pacing (see Wu et al. ([38]) for a recent review), the optimal pacing strategy for a full Ironman competition remains elusive and best practice recommendations are not consistent.

Research, based primarily on single-sport (e.g., swimming, cycling, running) laboratory studies, suggest that an even pacing strategy reduces physiological, kinematic, perceptual, and metabolic perturbations improving effect and performance ([1,8,31,32]). Conversely, field studies observe Olympic and Ironman distance triathlons adopt a positive pacing strategy ([2,22,23,36,37]). To combat fatigue in the later stages of the race, coaches may recommend a negative pacing strategy whereby exercise intensity starts relatively lower and increases throughout the race ([14]). The discrepancies between researchers, coach-recommended, and observed pacing strategies in triathletes highlight the lack of consensus, obscure best practice recommendations, and warrant investigation. In addition, we ([18]) and others ([6,7,15,33]) have shown in both field and laboratory studies that major changes in elevation substantially affect pacing strategy and race outcomes.

Evidence driving pacing strategy recommendations in triathlons is based on theory, simulated laboratory races, or observations and typically uses relative rather than absolute success (overall winner) as an indicator of pacing strategy effectiveness. To the best of the authors' knowledge, no study has documented the pacing strategy of an overall full Ironman winner. Because pacing strategy contributes to endurance race success ([1,13,17,22,38]), empirical data from an overall winner will enhance our knowledge base guiding pacing strategy recommendations in full Ironman events. Because pacing strategy contributes to endurance race success ([1,13,16,22,38]), empirical data from an overall winner will enhance our knowledge base guiding pacing strategy recommendations in full Ironman events.

Methods

Experimental Approach to the Problem

Using a mixed methods approach, this case report details the pacing strategy of a full Ironman overall first place female finisher. The Lake Placid Ironman is known for major elevation changes, including a 2,072-m elevation change during the bike and a 426-m change during the marathon. This case report is descriptive in nature and, to protect anonymity, we will use “Alice” as a pseudonym.

Subjects

This case report is descriptive in nature and, to protect anonymity, we use "Alice" as a pseudonym. Alice (age: 26 years; height: 163 cm; body fat: 10.1%; body mass [baseline]: 56.9 kg) was originally recruited for a research study examining muscle damage biomarkers after an Ironman race. Based on the field of competitors and her previous competition results, she was not predicted to win the race. Inclusion criteria for the muscle soreness study were projected finish time of <13 hours, no history of cardiovascular, metabolic, or respiratory disease, or other chronic health problems that could impact the athlete's ability to finish the race. Her overall first-place finish combined with analysis of her pacing prompted this case report, including an interview to gain insight into her pre-race preparation, in-race strategies, and race outcomes. Within 3 weeks after the race, University of Connecticut Institutional Review Board approved this study and Alice was informed of the benefits and risks of the investigation before providing written consent.

Procedures

Two days before the race, body mass and height were measured followed by percent body fat determined by 3-site skinfold technique ([5]). The day before the race, Alice completed a training history and pacing strategy questionnaire inquiring specifically about pacing strategy during major uphill and downhill sections of the racecourse.

On the morning of the race, a pre-race body mass was obtained; then, a chest-mounted telemetric heart rate (HR) strap and a global positioning system (GPS; SiRFstarIII) watch (Timex Global Trainer, Timex Group USA, Inc., Middlebury, CT, USA) were donned by Alice. Alice rode a bike outfitted with a power and cadence meter (Riken 10R; Quarq Technology, Spearfish, SD, Australia). Immediately after the race, researchers retrieved the GPS watch and uploaded the data into a software program (TrainingPeaks, Boulder, CO). The participant completed a post-race food and fluid log describing intake during the race. Nutritional data were analyzed using a nutrient database, Nutritionist Pro (Axxya Systems, Stafford, TX, USA). Using a physical activity compendium that indexes metabolic equivalents for various activities and intensities (e.g., velocity) ([3]), we obtained estimates of oxygen consumption values for each race segment. Using the American College of Sports Medicine metabolic equations and accounting for velocity, gradient, and the wet suit ([5]), we calculated estimates of kcal expenditure. Power data were obtained after the triathlete and her coach reviewed the data, approximately 48 hours after the race, and uploaded to TrainingPeaks. Environmental conditions were measured throughout the race using a Kestrel 4400 Heat Stress Tracker (Kestrel, Birmingham, MI, USA) at the finish line and 3 miles into the marathon course. Data from these 2 locales were averaged.

Racecourse Topography. The Lake Placid, NY, Ironman triathlon is a qualifying event for Ironman Hawaii and is considered one of the more difficult races in the Ironman circuit due to the frequent and sometimes dramatic changes in elevation ([9]). During the race, competitors complete a looped run and bike course twice. There are 3 major uphill and 2 downhill segments of the bike leg (2,072-m change) and 4 major changes in elevation during the run (426-m change).

Quantitative Data Management and Analysis. TrainingPeaks and Microsoft Excel software were used to manage cadence, velocity, power, and HR data collected during bike and run components of the race and to calculate normalized graded pace and normalized power (NP). Normalized graded pace and NP are proprietary algorithms (TrainingPeaks) that account for changes in course elevation and variability in power output, respectively, adjusting the velocity or watts to reflect the changes in grade and intensity that contribute to the physiological cost of running or cycling over varied terrains. Data were graphed using a high-frequency analysis (every km) with mean values and mean absolute percent error (MAPE) calculated for loop 1 and 2. Dependent *t*-tests evaluated between-loop differences with $\alpha = 0.05$.

Qualitative Data Collection and Analysis. We developed a semistructured interview guide based on the participant's triathlon performance. Interview questions focused on training leading up to the race, pacing during the swim, bike, and run, factors that affected pacing, obstacles encountered during the race, pre-race pacing strategy, nutrition, and use of technology to guide pacing. Where appropriate, the researchers used elaboration probes, which allow for a more in-depth answer when the interviewee is vague ([16]). The guide had both general discussion questions and specific probing questions regarding the race (see Appendix A).

At the start of the interview, verbal confirmation of consent to use the data and record the conversation was obtained. The transcript was then sent to the participant for member checking ([25]) where she was given the opportunity to edit any incorrect statements and approve the wording before data analysis. Two researchers independently coded the data at a descriptive level according to their main category (i.e., pre-race preparation, in-race strategies, or race outcomes). The data were then broken into meaning units and tagged with provisional labels that described the topic of the text segments ([11]). The 2 researchers then listed, compared, reviewed, and organized the meaning units in regular peer review and debriefing meetings. These meetings help establish trustworthiness because they provide an opportunity for researchers to be critical and identify any flawed thinking ([24]) about their data analysis process and its subsequent outcome. The researchers continued the peer review meetings until consensus was reached.

Results

Environmental conditions during the race were mild (ambient temperature: $26.0 \pm 3.0°$ C, relative humidity: $53.8 \pm 11.6\%$, wet-bulb globe temperature $22.1 \pm 1.9°$ C) with variable wind (14.3 ± 11.9 km$\cdot$h^{-1}).

Exercise History

Alice (age: 26 years; height: 163 cm; body fat: 10.1%; body mass [baseline]: 56.9 kg) had previously completed 3 full Ironman triathlons, 12 half Ironman triathlons, 5 Olympic triathlons, and 3 marathons. Her personal best for the aforementioned events were (H:MM) 9:20, 4:23, 2:12, and 2:54, respectively. Alice's full Ironman personal records for the swim, bike, and run components were 1:07, 4:53, and 3:10, respectively. Alice's goal times for this Lake Placid Ironman were 1:05, 5:20, and 3:10 for the swim, bike, and run, respectively, finishing in 9:45. From her personal best Olympic triathlon and marathon performance ([30]), her calculated finish time was 10:24. For the months leading up to the race, Alice trained 22 h$\cdot$wk^{-1}, 8 hours longer on average than other female Ironman triathletes ([20]). During her weekly training, 25% of the time was spent swimming, 55% cycling, and 18% running, whereas 2% of her time was devoted to resistance training.

Race Performance

When targeting hills, Alice planned to pace slower uphill for both the bike and run, and then increase velocity on the downhill sections of the race. This planned fluctuation in velocity was driven by the desire to minimize changes in HR throughout the race, consistent with an oscillatory pacing strategy.

Approximately 2 hours before the race, her body mass was 57.2 kg, 0.3 kg heavier than baseline. Immediately after race, body mass was 2.0 kg less than before race (55.2 kg), indicating a 3.5% body mass loss during the race. This body mass loss occurred despite consuming 1 L of water and 4 L of sports drink during the bike leg and 150 ml each of water and sports drink as well as 250 ml of Coca-Cola at aid stations during the run leg. Regarding her hydration plan, she mentioned:

> My nutritional [hydration] plan was kind of one to one as far as fluid an hour which was mostly the on course (fluid-electrolyte drink), but every three bottles or so I think I grabbed a bottle or two of water in there.

Alice's estimated calorie expenditure was 10,740 kcals overall, constituting 798, 6,633, and 3,309 kcals from the swim, bike, and run segments, respectively. We estimated that 3,999 kcals (93% CHO) were consumed during the event primarily in the form of sports drinks, energy bars and gels, and non-diet soda, leading to a 6,741 kcal deficit after race, on par with previous literature estimating ∼3,940 kcals consumed and ∼10,036 kcals expended ([19]). A large amount of sodium (6.3 g) and potassium (2.5 g) was consumed along with caffeine (622 mg) from foodstuffs, whereas 4 salt tablets (size not reported) were also ingested during the race. Alice shared:

> Food-wise, it was about 100–120 calories of either half a sport bar or a gel every 45–60 minutes on the bike. And then the run it just tended to become more of what I could get in when I could get it in. But I think that the run ended up working out just about a gel every 30 minutes, probably for the first couple hours of the race and then after that, it was mostly water.

When asked about pacing during the swim, Alice stated:

> For the swim generally the strategy is… that everyone takes off hard at the start. So I just need to go as hard as I can for as long as I can and try to stick with a good group.

Alice's pacing strategy differed in the bike and run segments compared with the swim. Numerically, velocity decreased during major uphill segments in both the bike (Figure 1) and run (Figure 2) components. During the subsequent major downhill segments, velocity was greater than race average in both the bike and run. These velocity changes resulted in only minor fluctuations in HR (Tables 1 and 2). She used wattage, perceived exertion, and HR intensity to gauge energy expenditure throughout the race. The following pacing strategy was explained by Alice.

> The pacing goals we had set were [to] try to hold around 200 W on the flats and the bike and then kind of cap it at around 220–230 on the climbs. On the bike, if I just go by numbers, I think sometimes I have been backing it off more than I should. I tend to go subjectively [within my planned wattage range]. And then for the run, it was to try to get the heart rate a little bit higher than the bike average had been and per mile pace I was hoping to be around 7 min·mi^{-1} on the uphills [and 6:15 min·mi^{-1} on flats]. Just kind of keep the heart rate steady…for both the bike and the run.
>
> I use [perceived exertion] more on the run just because I have my background in running. I use it mostly at the start of the run to kind of keep myself under control. …And then toward the end, I also sort of use it to motivate myself to keep the heart rate up a little bit more because I know I'm getting tired. I can rely a lot more on how I am feeling while running to sort of judge things. On the run, I tend to go a little bit more by feel just because I have more running background. So, when I first started the run, I didn't feel too great; so, I just kind of backed it off from, you know I didn't necessarily try to go out and get the heart rate up over the bike heart rate from the get go. I just kind of eased into it… just concentrating on being comfortable.

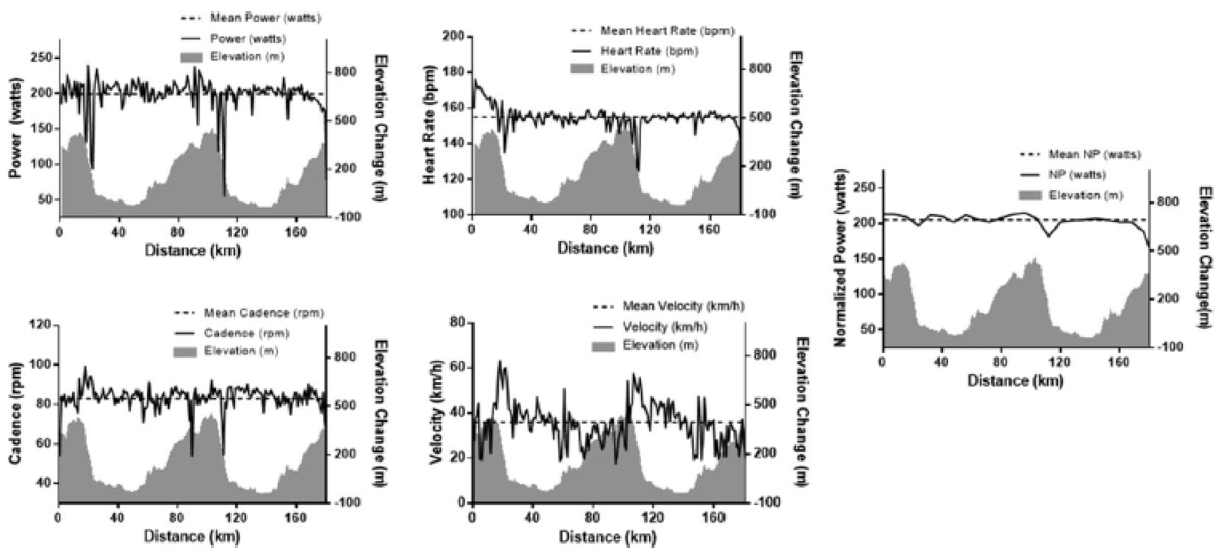

Figure 1. Velocity, watts, normalized power (NP), cadence, and heart rate during the bike component of the Ironman race. Dotted line represents race mean.

Table 1. Mean values and measures of variability during the bike.*

	Mean					MAPE (%)				
	Heart rate (b·min^{-1})	Velocity (km·h^{-1})	Power (W)	NP (W)	Cadence (rpm)	Heart rate	Velocity	Power	NP	Cadence
Loop 1	157	35.9	201.4	207.6	83	2.72	19.46	7.29	2.60	4.75
Loop 2	153	35.4	196.2	198.8†	83	1.89	21.09	6.75	2.80	4.47
Overall	155	35.6	198.8	205.0	83	2.31	20.27	7.03	2.70	4.61

*MAPE = mean absolute percent error; NP = normalized power. † $p < 0.013$ from loop 1.

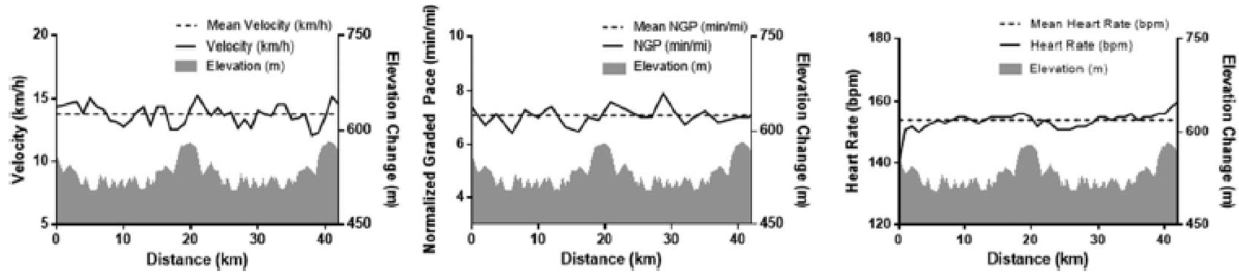

Figure 2. Velocity, normalized graded pace (NGP), and heart rate during the run component of the Ironman race. Dotted line represents race mean.

Table 2. Mean values and measures of variability during the run.*

	Mean			MAPE (%)		
	Heart rate ($b \cdot min^{-1}$)	**Velocity ($km \cdot h^{-1}$)**	**NGP ($min \cdot km^{-1}$)**	**Heart rate**	**Velocity**	**NGP**
Loop 1	153	13.9	4.3	1.20	5.10	4.41
Loop 2	154	13.8	4.4	1.20	4.50	2.76
Overall	154	13.8	4.4	1.20	4.80	3.62

*MAPE = mean absolute percent error; NGP = normalized graded pace. No significant differences were observed.

When asked how well she thought she matched this strategy during the race, Alice responded:

> Overall, pretty well. There were some moments where I just dropped off at the end of the bike, but other than that, it was pretty much right there at what I wanted to do. Looking back, I think I might have forgotten to take one of my gels; so, I think it was like more of a low blood sugar thing. But also you know I looked at my numbers and it told me, yeah you were switching pretty much right at the edge of what you could do for an Ironman.

At approximately 20–30 km and again at 105–115 km of the bike, Alice achieved her fastest velocities (~60–65 $km \cdot h^{-1}$) during the 2 major downhill segments, likely explaining the reduction in HR and watts. The reduction in watts, HR, velocity, and cadence at approximately 90 km of the bike was due to the course weaving through city streets, which included several 90° turns.

During the bike, NP was significantly lower during loop 2 vs. loop 1 (Table 1). Normalized graded pace was remarkably stable during the run. No other significant differences in any variable were observed between loops 1 and 2 for either the bike or run (Table 2).

Alice stated she did not allow external factors such as the crowd or other competitors affect her pacing strategy:

> I tried not to worry early on in the race too much about what everyone else was doing. I didn't worry too much about what the [women] were doing around me. I was calculating how far behind them I was. But, I wasn't necessarily adjusting my pace because of it. It was more just for my knowledge. I did miscalculate at one point when I was on the bike and I thought I was losing ground and I wasn't. There were a lot of spectators who were giving me [motivation] especially in the first part of the run when I was moving up there were a lot of spectators who were just telling me how far behind the pace I was. I don't

> think it [affected me] because I knew that if I was going to be able to run up and to go into the lead that it would be because I was running my race, not because I was blowing myself out in the first eight miles and running way faster than I should. I had to keep (how far behind I was) in mind, but also keep my wits about me in terms of what I was, in terms of what I could control. I wouldn't necessarily say the [crowd] influenced my pacing strategy but the last four or five miles [of the run] it was very helpful in terms of motivating me to finish strong.

Similarly, being the leader for the first time in any race did not affect her pacing:

> I think I was just trying to maintain my plan at that point in the race, and then I think with our last turn around with seven or eight miles to go at that point I had calculated how much of a lead I had and was just trying to figure out my running at pace, I was just trying to figure out how much time I could give back a mile and keep the same lead. I think when I took the lead, it was about half way through the run. So, it was exciting but at the same time, I was nervous enough because I'd never been in that position before. But, right after I'd taken the lead, my coach was there yelling at me, don't get too excited. There's a lot of race to go. You know it wasn't until I got to the oval for the very last straight away that I kind of let it go.

Discussion

To the best of our knowledge, this is the first study to obtain pacing and HR data of a full Ironman overall female winner. A unique feature of the Lake Placid Ironman is the substantial elevation changes that can affect pacing ([6,7,15,18,33]). The most interesting finding of this study was that, in line with the winner's planned pre-race pacing strategy, bike and run velocities were inversely related to major elevation changes, and when watts and velocity were normalized to changes in elevation, minimal fluctuations were observed (MAPE: ≤3.6%). In addition, HR during the bike and run remained remarkably stable (MAPE ≤2.3%). Given Alice's overall race performance, these data in combination with experimental ([10,33]) and field studies ([18]) support the efficacy of managing energy expenditure by fluctuating velocity over major terrain changes to minimize fluctuations in watts and HR, thereby curtailing dramatic physiological perturbations. Alice used technology and biofeedback to regulate her energy expenditure within her pre-planned wattage, HR, pace, and perceived effort ranges.

Topography has deterministic metabolic, intensity, and velocity consequences affecting pacing and overall endurance performance. Several studies show that despite an attempt to maintain an even pacing strategy, elevation changes resulted in variable velocity and power, likely due to greater or lesser external resistance caused by terrain changes ([6,7,15,33]). In the face of undulating terrain, Alice's power output varied 7%, but when normalized to elevation changes, variation was <3%. This suggests that her oscillating power output strategy managed to minimize physiological perturbation despite major terrain changes, evidenced by the consistent HR response. Consequently, velocity varied dramatically as speed slowed during uphill sections but increased during downhill sections (Figure 1). Alice's bike velocity varied 20%, much higher than reports of 4.3% in half ([39]) and 2% in full ([2]) Ironmans with somewhat level terrains. Relative overall race success was related to faster downhill velocity while minimizing HR and power output changes between major uphill and downhill segments in a recent full Ironman study ([18]). A review of literature suggests that the larger the gradient variance, the greater potential time saved with an oscillating pacing strategy designed to minimize physiological perturbations. Atkinson et al. ([7]) and Gordon ([15]) applied fixed terrain gradients of ±5% and ±2.5% while clamping power variation at ±5% of 224 W and ±20% at 435 W and estimated 2.3% and 1.6% time savings, respectively. Cangley et al. ([10]) compared constant and variable power outputs during an undulating 4-km time-trial course with a mean and peak gradient of 3 and 9%, respectively. Participants finished 3% faster when power output varied 27%. This time savings would have promoted the fourth-placed triathlete to the first in the 2013 Lake Placid Ironman. Practically, there is difficulty in defining a specific power output profile to sustain physiological homeostasis within “acceptable” ranges. Data from this case report and previous experimental ([6,7,15]) and observational ([18]) studies suggest that on racecourses with major terrain changes, oscillating power output sufficient to minimize physiological perturbation may be a beneficial pacing strategy to adapt.

The top quartile of finishers in the 2009 IAAF women's marathon championship ran a more even race pace compared with lower quartile finishers ([28]). Using a sophisticated statistical approach that accounted for environmental conditions, Angus ([4]) demonstrated that running velocity varied 4.9% during 2 world record–setting marathons. Similarly, Alice's run velocity varied only 4.8% despite major terrain oscillations, and less so after normalizing the data to account for said oscillations. Within the limitations of comparing across statistical computations, these results lend credence to the notion that maintaining a mildly oscillating velocity (rather than strictly even) is favorable. Again, the acceptable degree of velocity variation is unknown and currently debated, although some purport that an oscillating run velocity within 5% in prolonged endurance races is acceptable and beneficial ([2,4,28,35]). This value is likely dependent on a range of conditions such as exercise mode, topography, environmental conditions, and race tactics. It should be noted that determinants of competition success are multifactorial and the overall race winner's pacing strategy does not necessarily imply optimal pacing nor should be considered as the sole factor leading to success. Indeed, other triathletes may have exhibited more “optimal” or consistent physiological responses during the race but be defeated for reasons other than pacing. However, the association between Alice's pacing strategy and finishing position is noteworthy.

On average, full Ironman female triathletes train 14 $h \cdot wk^{-1}$ across all 3 disciplines ([20]). Alice reported training 22 $h \cdot wk^{-1}$ in preparation for the Lake Placid Ironman and because total weekly training volume in female triathletes is related to Ironman race performance ([21]), she was well prepared in this regard. Within the average 14 $h \cdot wk^{-1}$ full Ironman females triathletes typically train, 19, 52, and 25% of the time is spent swimming, cycling, and running, respectively. Alice spent a greater amount of training time swimming (25%) and cycling (55%) compared with running (18%) and strength training (2%). The differences in time spent training in the swim, bike, and run likely reflect individual strengths and weaknesses. To reach optimal finish times, her training focused on “weak” areas in which the greatest improvements from training were likely to be realized. However, she did not explicitly state in her interview whether she practiced her in-race pacing strategy, although one would speculate she did.

Practicing one's in-race nutrition strategy before major events is recommended ([29]) because overall Ironman finish time is inversely correlated to exogenous carbohydrate consumption

([19,27]). We estimate 3,999 kcals (93% CHO) were consumed during the event and 10,740 kcals were expended, leading to a 6,741 kcal deficit after race. These estimations are on par with previous literature estimating intakes of ~3,940 and expenditures of ~10,036 kcal during full Ironman races ([19]). Alice practiced in-race nutrition during training and recalled that she did not deviate from pre-planned food and hydration strategy (except one missed gel during the last 30 minutes of the bike). Alice's in-race nutrition plan was consistent with sport nutrition best practices for prolonged endurance events ([29]). Constructing an in-race nutrition plan around best practices and adherence to this plan contributed to her ability to sustain her *a priori* pacing strategy and success absolute race outcome.

Practical Applications

Success in prolonged endurance events is multifactorial. Training in preparation for the race, in-race nutrition, mental toughness, and pacing strategy are among the factors that influence race outcomes. Extending on previous laboratory and field studies, this case report provides novel qualitative and quantitative data detailing a pacing strategy used by an overall full Ironman female winner that may be advantageous in events with similar course characteristics. Specifically, in full Ironman racecourses with major elevation changes, minimizing variations in HR or watts by oscillating velocity ~5% during the run and ~20% during the bike (e.g., slower during uphill and faster during downhill segments) may contribute to race success. Minimizing distractions from competitors and the crowd while adhering to pre-planned in-race food and fluid consumption rates seems to aid in pacing strategy fidelity.

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Appendix A. Pacing Strategy Semi-structured Interview Guide

1. What do you know about your threshold (lactate or ventilatory) running pace?
    - Heart rate?
    - Power (watts)?
2. What do you know about your maximal heart rate?
3. Describe how you tested for these?
4. Do you know your crank size (length and # of cogs)?
    - Why did you select this size?
5. Explain your pacing strategy for this race?
    - Swim? Bike? Run?
6. How well did you match this strategy?
    - Why or why not?
7. Describe how you used feedback from technology or your body to pace yourself during the race.
8. Have you used this pacing strategy before in competition or in training? If so, what were the outcomes?
9. What component of the triathlon is your strength?
    - Why?
10. Did the **field of competitors** influence your pacing strategy during the race?
    - If so, how?
    - When?
11. Did the **crowd** influence your pacing strategy during the race?
    - Specifically during the beginning of the bike?
    - During the run?
12. Describe setbacks you experienced during the race. For example, mechanical, during transitions, physical (cramping, urination, diarrhea, etc.).

13. How did being in 1st place affect your pacing strategy during the race?

14. Did you plan or expect to be the top female finisher in the Lake Placid Triathlon?