

The Art of the Time Trial



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written by Richard Diaz

“If you know the enemy and know yourself, you need not fear the results of a hundred battles.”

Sun Tzu

When speaking to a competitor before a race, it is not uncommon to hear comments like, “I hope I can...” you can finish the quote as I am sure you have heard it many times yourself. It’s like jumping from a cliff into a pool of water, not knowing how deep it is, or if you will end up hitting the bottom, a leap of faith. If someone I am training, who has followed my advice and training principles says this to me, I can’t help but believe I have failed them.

My favorite quote is by Louis Pasteur, a French chemist and microbiologist renowned for his discoveries of the principles of vaccination commented over a century ago:

“Chance favors the prepared mind.” By this he meant that sudden flashes of insight don’t just happen— they are the products of preparation. Preparation, therefore, is the key to success.

A training program is no more than a guide built on the success of others. No program can be written that will foretell the future. Decisions regarding training, day to day, are best determined upon feedback from the body and the results gained from our efforts. This is

why it is critical that we continuously quantify our processes. As a runner who sets out to improve upon previous race results, there are two components that set the stage for success or failure; the work we do and our ability to interpret the result. Literally everything we do in preparation for an event plays into the outcome. Some things we do are beneficial, some not. For example, waking up in a dehydrated state and under nourished will undoubtedly effect the days training performance. If we vary our approaches in training from day to day, our training success or failure becomes a mystery. We can never fully realize our potential because we don’t have a clue as to what elements of our training are working for or against us.

Training is complex, especially if we hope to improve. Sure, being consistent, getting up every morning and logging in the work will show progress eventually. However, almost every athlete I had ever met holds a strong curiosity as to what they are truly capable of and what are the mechanisms needed to realize this potential. This is where time trials come into play. Think of everything you do, every mile you run, every exercise you perform and every

meal you consume as stimulus, input that will influence your outcome. What most typical training programs cannot do is insure success for everyone. We are all unique creatures, our body types and morphologies are our own. What works for some may not work for all. A time trial is what I like to refer to as “*The come to Jesus meeting*”. By periodically performing time trials while training, you are assessing the success of your program.

Traditionally, a time trial is seen as an all-out effort to determine who is the fastest, often seen in cycling events. Where this is certainly a useful measure of how fast you are, it has nothing to do with what made you fast. It is a “reactive” event; you push as hard as you can to see how fast you can go against the clock for a given distance, the outcome is the reaction to your effort. The types of time trials that I am writing about are “proactive” time trials. The difference is in the level of control and intent.

For the sake of simplicity, I am going to refer to running as the project you hope (*I don’t like using the word hope in training*) to improve upon. Know that it really does not matter what sport are trying to improve, be it cycling running, triathlon, obstacle racing etc., the premise is universal. What matters is how skillfully you conduct your comparative analysis (*the time trial*).

As a runner, a goal may be to run a marathon or any lesser or greater distance you can introduce a time trial anywhere along your training path and it will be a useful tool to assess your progress

and potential. What I am suggesting is that regardless if you are taking your first steps, already mid training or even near competition, evaluating your progress through time trials will quickly demonstrate where you are with your progress.

What is it that I am trying to evaluate?

In endurance events, clearly as the term implies, “endurance” is the primary component of your success.

Let’s face it;

- *Goal #1 is being able to complete the event without having to walk.*
- *Goal #2 is finishing as quickly as possible.*

Initially, to successfully achieve goal #1, your concerns relate to the stimulus you take on to improve your stamina and endurance. Of course, I am speaking of your aerobic potential. If you don’t know what that means, I suggest you stop right here and read [“MY BEST RACE”](#). As indicated in my book, the most effective way to improve endurance is by spending an appreciable amount of time training below your anaerobic threshold. Training aerobically will provide the staying power you seek but it will not make you faster on its own. I like to refer to the complementary components of motor skill training and aerobic conditioning as “The one-two punch”. While training aerobically, the oxidative environment you are bathing your working muscles in does a fantastic job of

teaching your body to access your unlimited fuel source-fat. Motor skill training is the study of movement, training to lower the cost of work, becoming more efficient while producing more speed. These two “stimuli” represent a recipe. This recipe begins with an evaluation of your current ability. Because what we are trying to measure is twofold, how much endurance potential you have and how quickly you can cover a distance, the trial needs to be standardized so that future comparisons will be valid. To do this, you must train using a heart rate monitor.

As of this writing, a heart rate monitor is the most effective way to measure the cost of work. “Cost” suggests the calories expended and intensity applied. By standardizing the cost factor, you can get a very precise measure of the cost vs. yield. “Yield” being the distance you can travel and how quickly you are able to cover said distance. I suggest that your first time trial be conducted over a one mile course. Where ever you decide to conduct this trial, it is critical (*initially*) that the trial is conducted over flat ground, a track is best. Conduct your trials under as close conditions as possible; the same time of day, same environmental conditions (*wind, heat, cold etc.,*) and the same physical circumstances, appropriate amount of rest, etc. Any comparative analysis is only as effective as the relative conditions in which your comparisons are conducted.

What we are setting out to do is to measure our success as it relates to our two primary goals; #1 Improve endurance, #2 Cover a distance more

quickly.

We have chosen two stimuli as our training components; aerobic conditioning and motor skill development. Now it’s time to do our first time trial. If you have read anything that I have previously written on the topic of heart rate training; [“Training the Dark Side”](#) or “My Best Race”, I have said that in order to successfully set about training, it is critical that you determine your anaerobic threshold. Deterring your threshold is best conducted through a VO2 max test if you have access to someone (*like me*) who can provide you with this precious assessment. In the absence of this opportunity, simply:

Subtract your age from 180, add 10 bpm and use this as a reasonable prediction.

*Example: 35 yr old=180-35=145
bpm+10=155 bpm*

Conducting your first Aerobic Time Trial Start your heart rate monitor, warm up, stretch (*if you do this commonly*) and begin running. When your heart rate rises to 155 bpm begin timing and measuring your distance until you cover one mile, without allowing your heart rate to exceed your target (as in the example 155 bpm). If you need to slow down or even walk, do so in order to keep from violating your target heart rate. Record your results for later comparison.

Now it’s time to begin training. We have chosen two stimuli as our training methods, all that’s left

is to determine how much time we will dedicate to each of these training elements and for how long before we assess our progress. I think it's important to point out that this paper is not written about what we do or how often, it is about how we evaluate what we've done. Again, if you are unclear as to process I will once again refer you to My Best Race as a tutorial on how to periodize work and what the expected return is relative to time invested to any particular training stimulus.

As I suggested earlier; we are all unique creatures, what works for some may not work as quickly for others. This fact alone provides solid argument for why we would bother to conduct these periodic time trials. Our goal in assessing our progress is to have as precise an understanding as possible as to "what" is working, what is not and "when" our progress unfolds in training. The exercise scientific community has long ago, determined reasonable conclusion of cause and effect where training intensity and duration are concerned. From this science, can make prudent decision's regarding the triggers to pull in training to arrive at a particular end result. What we don't know is how our unique physical make up will respond and how long it will take to get the responses we are looking for.

If you are shaking your head right now and starting to get confused, simply refer back to the two components rendered in our first time trial: Aerobic Conditioning and Motor Skill Development.

Why only two components?

If I were to provide you a laundry list of exercises, variations of training intensity; such as the common jargon runners use, tempo, fartlek and the like... Let's say 5 weeks into training you perform a follow up time trial and you have great results, what is the cause of the success? What if you saw little improvement or worse? What would be the culprit to omit moving forward? You can't know.

**"Everyone has a plan 'til they get punched in the mouth."
- Mike Tyson**

The most effective thing you can do in training is be as specific as possible; know what the results are from your specific efforts. For example: We know that endurance is generated by spending time aerobically in training. The more time you spend the quicker and more profound the result. Motor skill development training improves the efficiency in your movement, "MSD" training will eventually evolve into more intense albeit shorter in duration each session relative to the time committed to your aerobic conditioning. If you held off from infusing random stimuli and stuck to a simple plan, you will easily come to know what was causing your success or what more is needed. For example: If you found that after 5 weeks and in conducting a follow up time trial, your result was a 1 minute drop from your one mile pace, it is quite likely that the aerobic

conditioning along with the MSD sessions are working. If you did not change a thing except for your volume (*increasing progressively over time*), then after another 5 weeks, you do not see further improvements generally, you can deduce what is lacking. It may be that you are not devoting enough time to skill work or, it may be that you unconsciously allowed your heart rate to drift above threshold too often which countered your aerobic development.

You may have spent too much time with MSD and your outcome countered the aerobic component. Whatever the scenario, there are only two suspects, both powerful assets wielded in proper dose, if it's not one it's the other; simple to identify, simple to fix.

Aerobic Time Trials over varying distances
Our initial time trial was pretty simple, it was conducted over a short distance and the training infused only had two components. I'll tell you now, that as simple as it may seem to you, almost seeming ridiculous, I have witnessed incredible results from countless clients who followed this simple process. These are people who came from far more complicated training programs, hit a plateau and were virtually lost. We broke things down into two simple components, addressed the volume and intensity and within a few weeks their time trails revealed serious improvements.

Depending on the specific event you plan to prepare for is what determines the progression

and distance of your forthcoming time trials. The key word here is “Progression”. You may find that your mile pace aerobically for one mile is not sustainable for five miles or ten. Other factors arise as we expose ourselves for longer duration; things like, hydration or dehydration, electrolyte balance or imbalance muscular endurance just to name a few. These hurdles represent opportunities to learn and adjust.

If you jump to far forward, say by following your one mile time trial by a ten mile, you miss what may have been different over five miles of exposure. I think it’s important to remind you that an aerobic time trial at whatever distance is the most efficient mode of travel. You are able to access more energy aerobically than you will anaerobically. Heart rate is a direct correlate to energy cost. Before we begin to concern ourselves with how fast we can cover a distance, we first need to know if we can cover it (*preferably without having to walk or crawl*).

This is why before we begin experimenting with intensity in our time trials; we need to experiment with our sustainability. Thus; our time trial progressions should lead up to or near the distance we plan to compete. Personally, I do not recommend going beyond 20 miles with a time trial in preparation for a marathon but I would time trial right up to 14 miles preparing for a half marathon.

Before I move on to more complex processes, let me recap:

- *Our initial time trials should always be conducted aerobically and distances must be progressive.*
- *It is wise to keep things simple so that we are not lost in respect to what specifically provided benefit.*
- *You can perform as many time trials as you like but realize it takes time for your body to adapt to training, some longer than others.*

If you are suspicious of your ability, if it seems like you are noticing a turn for the better in your training, sure, go ahead and check it out. What you don’t want to do is make yourself crazy putting yourself on trial too often. You’ll just crap yourself out if you don’t see the results you hoped for. I recommend that you do your follow up to your initial time trial in 6 weeks, if you are putting in a lot of volume, maybe 4 weeks. Anything before then is an exercise in futility. It’s much like someone on a diet weighing themselves every morning. Some days your up, some days your down. What we are looking for is trends over time.

Incidentally, if through having conducted a time trial you experienced profound results, you may want to replicate the test again in a few days to insure that it was not just a freak occurrence. The reason I say this is because as your training unfolds, there will or at least should be progression, not only in volume, but in variation

of intensity. You don’t want to escalate your intensity until you are sure that the conclusion from your six weeks of effort is pointing you in the right direction. Having said that; if you don’t see the results you expected, you may need to dedicate another week or two or increase the volume. It’s better to wait then to simply move forward because if you do move forward without the adaptations you waited for, you will very likely get lost and end up hitting a plateau.

Time Trials on Varying Terrain

Many of you who read this race on trails and trail running is complex. I am a huge fan of hill repeats for improving VO2 max and muscular endurance and I think it is important that you check your work over these types of terrains. As was the case in the initial time trial instructions the same rules apply here. In order to have solid comparative data you need to use the same test ground for your time trials. Realize that running up hill over undulating terrain is difficult to do while staying aerobic. These time trials should be supportive to your aerobic time trials. The goal of your initial time trails #1 Improve endurance, #2 Cover a distance more quickly. Your goals for your trail time trials will be different: Now your goals may be to #1 Improve lactate tolerance #2 Improve muscular endurance #3 Improve technical skills. #4 Improve your heart rate recovery. Given that these time trials are now introducing some aggressive intensity, another key marker of your progress is your recovery heart rate at the conclusion of your hill interval repetitions. Regardless of the end game, what is most

important is, knowing what it is you plan to accomplish, what the modes of exercise are that you plan to bring to your training, the volume and intensity you put forth and the expense associated with your efforts.

The time trials, regardless of intensity, duration or technicality, serve to inform. They let you know where you stand, they tell you if what you are doing is working or not and with time and experience, what you need to do to adjust your process so that you stay on track and continue to progress. Regardless of the intensity, duration or technical aspects of your training it is important that you collect as much data from your efforts as possible most importantly, heart rate because this data point represents cost. It is possible to run faster at less cost which is obviously what we want to see, but it is also possible to run faster at greater expense. The latter consequence will be measured by the distance or time that your competition requires. If you are competing in a sprint event, it is not likely that you will run out of energy. However, if you are not training properly for a sprint and you have not adapted to the lactic acid development that comes from these intense efforts, your performance will suffer.

Every workout tells a story, putting relative stimulus back to back creates adaptation. Training randomly, will result in random results. If you don't know the mechanism that caused you to succeed or fail all the data collection was futile. Time trials steer your progress. There is so much you can learn from these trials it is almost hard to list all of the benefits. When you

consider the limitless variables that influence your progress having a means to grade your progress and to guide you in the right direction is undeniably the most important ingredient in a training program.

There is a considerable difference between making judgments about your training via time trial evaluation vs. simply keeping a training diary. A training diary is a record of all the work you've done. Data collected from time trials is an account of your ability or inability and a guide to self-corrections.

Race Pace Time Trials

A race pace time trial is the most traditional time trial. If this is all you do, all you learn is whether you are going faster or not. Certainly there is much to learn even from this process, such as where you fail, blow up or potentially able to push harder. What is lacking is what brought you to this place to begin with. The initial time trials are developmental. They teach you what to do and when to do it, they bring you along in progressive fashion and they help you prepare for the things that you learn are inevitable. Things like when and how much and how often you should feed and drink. You will also be capable of developing sound race strategies, based on energy expense and lactate tolerance, you can effectively run a tight race with the knowledge of what you are able to get away with, when to throttle up or down your pace.

I will conclude by sharing a quote I read that I

found worth repeating and it seems like this is a great place to share it.

“A goal without a date is nothing but a conversation”.

The most effective way to create a training program is by beginning with a goal event and working backwards. For example if I decide I want to do a Spartan Beast Event in November, I'll work backwards in time to lay out my training plans. I'll want to insure that I have enough time to accomplish my training goals, allow enough time for errors and the need to add time to insure adaptability and make all of my critical decisions based on the way my time trials unfold. Best of luck to you-

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