Siren Amelia Seiler
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Interview with Dr. Stephen Seiler

Background questions:

1. What is your field of expertise?

I am a professor in sport science. My specific expertise area is the interaction between physiological adaptation processes in the heart, blood vessels, skeletal muscles, brain etc., and the training processes we use to induce those adaptations. I try to understand how best to train when the goal is to improve our physiological capacity, particularly within endurance activities.

2. How did you discover exercise physiology?

Well, when I was a kid I really enjoyed science. I even built a kind of laboratory in the closet under the stairs where I had chemistry equipment, a microscope, and lots of little "specimens" I collected out in the forest and in the creeks and ponds around our house in the country. But, at the same time, I loved sports! So, I played school sports in the morning and then came home to my laboratory in the afternoon. The school stuff in the middle was mostly boring but I did it pretty well. Sports and science were separate worlds. Then when I was about 15-16, I was reading "The Complete Book of Running" by a man named James Fixx, and came to a chapter titled "The Scientists of Sport". I think maybe I knew what I wanted to be already after reading that title. But, for sure I KNEW what I wanted to be by the time I finished reading the chapter. Everything just clicked in my head, and I ended up studying exercise science as a university student and did a bachelor, master, and a PhD in that field.

3. Did you always know this was the career path you wanted to pursue?

Before I connected sports and science, I wanted to be a coach, but was unsure because I also liked the science stuff and did not know if coaching would be an outlet for those interests. But, once those two paths came together, I stayed on the sports science path and never regretted it. I do remember playing with the idea of becoming a medical doctor while I was an undergraduate, but ultimately I realized I wanted to study and work with human performance, not human disease.

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4. What did you do in your younger days (sports)?

Well, I grew up in the southern United States. Football (American football, not soccer) was king, and I loved the sport. So, I mostly played football and ran track and field when I was young. I was just not built to become a football star and there was no rowing or cycling, or XC skiing where I grew up, so my introduction to these sports came much later. I actually sat on a road bike for the first time at about age 22, during a rehab from knee surgery. Six weeks later I entered a local bike race, got third, and realized endurance training was both intellectually and physically a fun pursuit for me.

Running performance:

1. What are the main components of a successful training plan?

The training plan should be guided by and honestly in line with your long-term goal(s). The goal is the homing beacon shining in the distance. It is what drives the training plan and gives it long-term continuity and logic. If you do not really know where you want to go, it is kind of hard to make a plan for getting there. Between where you are and where you imagine reaching lies a pathway that you must construct, first mentally, and then in reality. That pathway is then broken down into intermediate goals, like specific races or events. These are important anchor points that give motivation along the longer path, and feedback along the way. The training plan needs to be built on the principles of sustainability and patient progression in training load. Athletes reach big personal goals when they stay healthy, stay motivated, and show up to do the work, week in and week out. So, perhaps the next most important component of the long-term plan is sustainability. The athlete needs to look at the plan and think, "I can do this, I will have to develop along the way, but this will bring out the best in me, not break me."

When we zoom down to the more typical "weekly training plan" level, I want to have a clear idea about 2 major aspects of the weekly plan: 1) what is the total training volume that we want to achieve (hours or kilometers) and 2) what "hard" sessions are we going to insert into the plan for that week? Both of these questions depend on the athlete and where they are in

their development both long term and short term. So, what we do next week always needs to be connected to what has been done in the previous weeks. Then, we have to agree on some details about how long the easy sessions should be and how hard the hard sessions should be.

Finally, when we come down to the daily workout (or workouts), it is all about execution. It does not do any good to create a well-balanced, disciplined training plan for the week if the athlete works too hard on easy days, and feels too tired to mobilize for the hard days. As a coach, I want honest feedback about how each workout was performed. Then, coach and athlete have a good basis for making smart adjustments along the way. Training plans are not written in stone; they are guides, not handcuffs. So, good feedback about execution and responses to the workouts makes for smart adjustments and even better training plans in the future as athlete and coach learn together.

2. How do you "build the pyramid"?

You make sure the most important things are what you keep your attention focused on, and not the "bells and whistles" that often end up being distractions. Training is not rocket science. Champions become champions by doing the work over time. Unfortunately, the fitness industry makes money by constantly churning and creating "new short cuts" to a fitter body, or faster 10k. These can be very enticing and distracting from the proven pathway to success. You build the pyramid with regular training, slowly building up the training frequency and duration your body can absorb without excess fatigue and injury. To that, you add a regular dose of hard training (like those hard interval sessions), learning how much of that ingredient in the training plan gives progress, and how much pushes you over the top. Just getting the ratio between hard and easy training right solves a LOT of problems and creates a great platform for development. After that, you build in the details that help you to TIME your fitness progression so that you are at your best when you stand at the starting line. But, the basics are what get you there.

3. What is the importance of periodization?

Periodization is a word that has taken on a life of its own in sports training circles. People seem to think that periodization is some kind of "science-ish" magic planning pixie dust that

will make them better. The term has roots in business management theories dating back well before sport science was even a thing. Periodization was integrated into sports training theory by coaches and sport scientists from the Soviet Union (old USSR) who seemed to be inspired by the 5-year production plans that their leaders were fond of at the time.

These plans were highly structured and rigid, treating humans like buildings being constructed. The success of these rigid training plans was based on the survival of the fittest concept. Soviet coaches had LOTS of athletes to choose from. Most fell by the wayside, but those who survived and responded to the training program sometimes won on the international stage.

Building a garage is a very linear process. Every step needs to happen at the correct time in the right sequence, or the garage falls down. Building an athlete is NOT a linear process! You need a plan, yes, but your plan will be iterative, it will evolve and adapt to the body´s responses along the way. Lots of things are happening at the same time both inside and outside the athlete´s body. The training plan will have to adjust to other things in life, like university exams, sickness, car crashes, or the emotional stress of a relationship break-up. This is the real world and athletes live there too.

When we have studied the training of the world´s best endurance athletes, we see that they have a PLAN, but they adjust along the way. They listen to their bodies and individualize. What we do not see is lots of very clever details or "magic" in the training plans, or their execution. The *magic* emerges from the daily grind multiplied by weeks and months and years. Champions all share the talent of tenacity. That is why many Norwegian athlete have had no problems with making their training diaries public. They know that it is not "the training plan" that builds champions, it is the tenacious execution of that plan day by day, and knowing when to deviate from it.

4. How do you use your knowledge as a running coach?
    - What numbers do you look closest at when analyzing a workout?

I think I try to integrate the physiology and the psychology of the training process. I look at training volume. I look at physiological and psychological responses to the standardized HIT

sessions in the program as indicators of capacity status. Athletes have to dig deep sometimes, and they will have days when they hit their limits. That is part of the process. But, what I look for is early indicators that they are "falling apart", that the load is too heavy, or they are losing motivation. It is the brain that "cracks" first during hard training, not the body. So, I measure the body, but "listen" to what they athlete is saying and feeling. I miss or misinterpret signals sometimes, but that is what I try to do.

5. What is the importance of rest for performance?

Rest is just as important as training. Knowing when to rest is one of the traits that distinguish the best from the rest. The best trust their bodies and the signals that their bodies send to their brains. They train a lot, but they are not afraid to spend the day on the sofa when that is what is needed to absorb the training.

6. Have you learned anything new in the later years?

Ha ha, I sure hope so! The day I stop learning and seeking to learn is the day I need to pack it in and go push up daisies in a cemetery somewhere. When it comes to endurance performance, I am trying to learn more about the physiology of all the low intensity endurance training that forms the foundation for endurance performance. I have studied the overall training intensity distribution a lot. I have studied interval training a lot. But, I think there is still much to learn about what happens during those long "low-intensity" training sessions and how best to plan and perform this training.

7. Where do you think the sports science world have the greatest development potential for the future – what do we not know much about today?

This is an interesting question. On the one hand, the basics of training are not going to change because they are based on human physiology that has evolved over millions of years. On the other hand, technologies for measuring that physiology have exploded in recent years. In our digital world, we can also now collect data on thousands of athletes of all abilities who are all experimenting every week with the training process. So, I think there is huge potential in the "wisdom of crowds". By carefully examining all of the data being generated on both

the crowd scale and the individual scale, sport scientists can give athletes at all levels a better framework for owning and optimizing their own training process.

8. What is the connection between the mind and the body?

The better question is probably what is NOT connected? I learned as a student that "every cell is psychological" and the truth of that has become more clear for me over time in this research world. Individual cells communicate with each other. Our organs communicate with each other. Our bodies send messages to our brains and our brains respond. This continuous conversation is fundamental to the training process and to performance. It is what makes training possible and it is what makes human performance so fascinating.