Back to Basics – The Underrated Importance of Rest and Recovery

By Steven Quek

Introduction

Recently, I have had the privilege of working with a few triathletes and marathoners. Such people are generally very committed, enthusiastic and hardworking athletes, whom I feel are a pleasure to coach. However, after working with them, I found that they possessed certain misconceptions, one of which was: "If some training makes me good, more training will make me better".

Such mistakes are often made because these athletes are over-enthusiastic and determined to do well in the sport. They want to do well, and they base their decision to train more frequently on anecdotal, social-psychological factors, rather than on an understanding of training principles. As a result, their good intentions result in frustration. Not only do they not see the improvement they expect, they sometimes get into trouble.

What is the cause of their problem? How can more training be "bad"?

One of the problems is that they do not understand the role of rest and recovery in sports training. They understand the concept that if we don't work hard enough, we won't improve, but not that doing too much may subject us to the risk of becoming over-trained. A more detailed understanding of this relationship may be necessary for such athletes.

Rest and Adaptation to training

Training effect is basically a product of stress and adaptation. Stress is placed on our body system when we train. The system then undergoes processes to adapt to the stress so that it is ready for future stresses. Consequently, the body becomes stronger.

What is important, however, is the need to take note of *when* this adaptation occurs. Many athletes believe that we get stronger during the training. The truth is we only get stronger after we train. When we complete a hard workout or race, we are actually weakened, because our body has just undergone immense stresses and needs time to recover and adapt. This adaptation takes place during recovery. This, to me, is one of the commonly misunderstood concepts of training. Recovery is essential to improving performance. Without adequate and well-timed recovery, improvement will not take place.

Let's take a look at some illustrations to help us understand this relationship between fatigue and training effects.

Below (Diagram 1) is a diagrammatic representation of the changes after a training session (be it a long run, interval training or strength training). The vertical axis represents performance level (or fitness level), while the horizontal axis represents time, which may be hours or days.

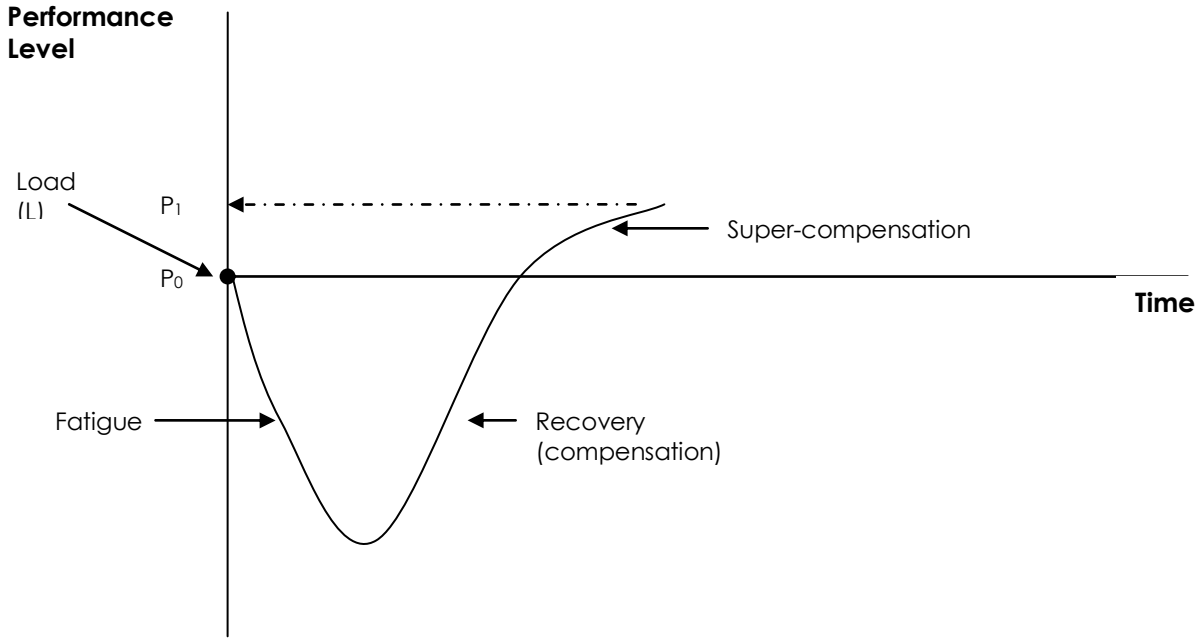

Diagram 1 – Adaptation to training (adapted from Yakovlev, 1967)

P_0 denotes the base level of the performance level (or fitness level) of the athlete.

As an athlete undergoes training, he is said to have subjected his system to a training load (L).

There is a fatiguing effect on the body.

Once training ceases, the body attempts to recover by replenishing depleted energy resources (e.g. carbohydrates, phosphorcreatine) and repairing any breakdown in the muscular system (e.g. myofibrillar damage).

The beauty of this recovery process is that it goes beyond the initial level of performance (P_0) to reach a higher level (P_1). The particular system is said to have undergone super-compensation (or over-compensation). The athlete is now at a higher level of performance (P_1) than the initial level (P_0).
This super-compensation is the main physiological objective of training.

The extent of super-compensation for an individual depends on the volume and intensity of the training load. This may take a few hours to a few days to complete. Subsequent stress should be introduced after super-compensation has taken place. Only then will the body benefit from the training loads.

In the following diagram (Diagram 2) we can see that when the runner trains regularly, his performance develops. Each successive training load is marked with the letter "L." The intention is to time these training loads in such a way that they correspond with the period of super-compensation that follows the previous training. The result is an increase in overall performance. That is the idea of regular training. However, it is only possible when there is "rest" or "recovery".

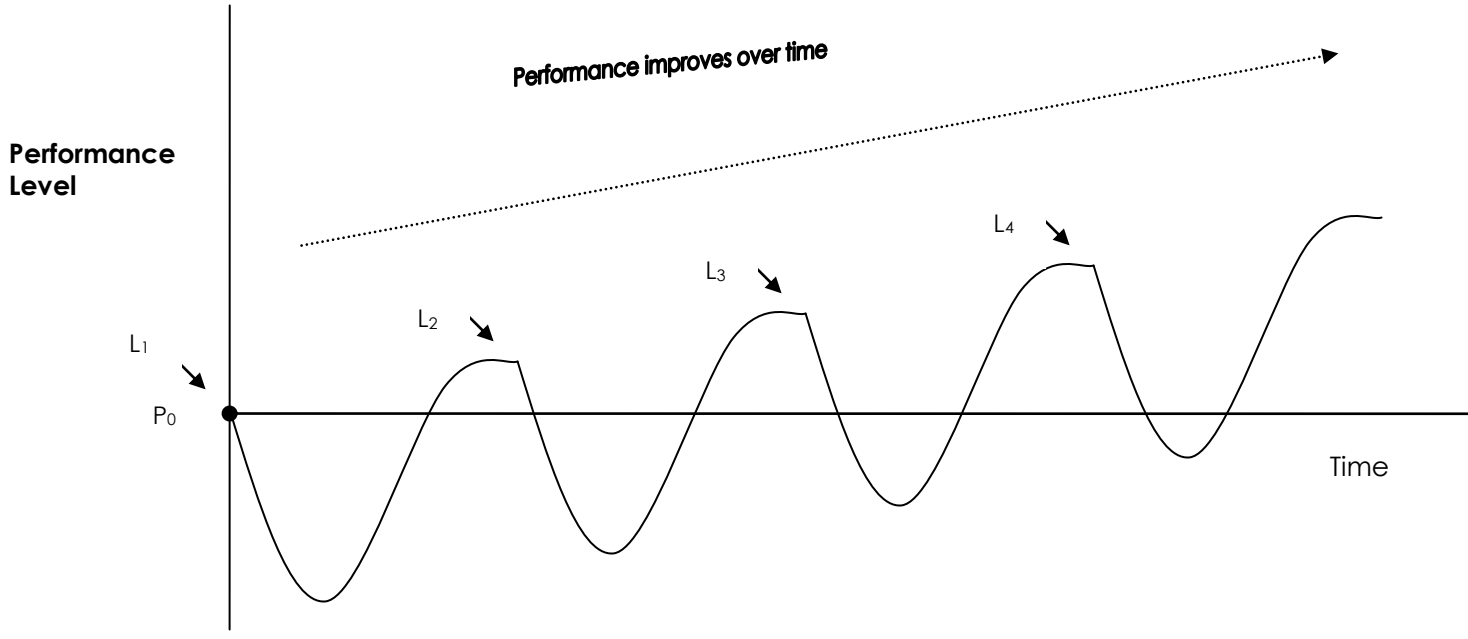

Diagram 2 – Accumulation of training effects

The athletes need to realize that full recovery and super-compensation will not take place when there is inadequate rest in the training programme. Neither would it occur when there are too frequent and too intense training load. This problem is what we commonly term "over-training" (illustrated by the following Diagram 3).

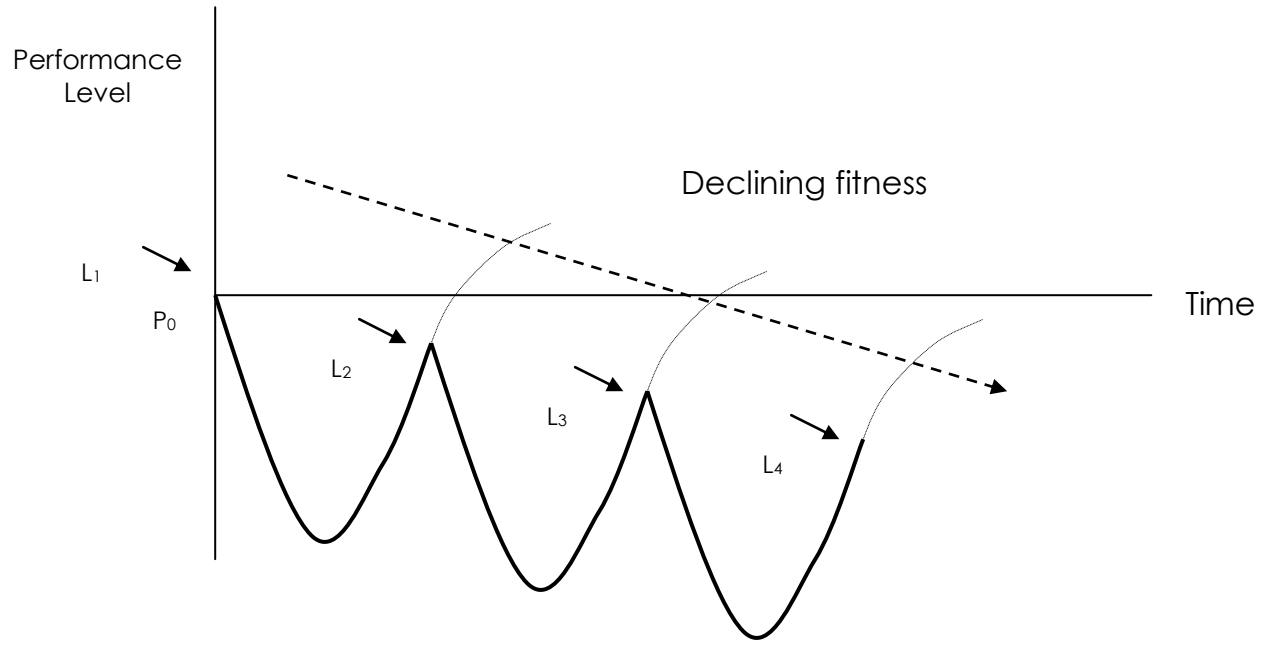

Diagram 3 – Inability to adapt due to insufficient recovery, often known as "over-training"

The runner has worked too hard or too frequently, subjecting himself to additional training load before the body has adapted to the previous session. As a result, not only does the training not convert to improvement, performance actually worsens over time. Besides this deteriorating performance, he may also experience more serious problems like loss of appetite, poor sleep, weight loss, illness and even injuries.

Of course, when there is too long a time lapse between training or when the training load is too light, there will also not be any adaptation and compensation. However, this is not an issue of concern with regard to the athletes in this discussion.

Finally, a frequently-asked question whenever I attempt to explain the above to our triathletes and marathoners is: "How soon is too soon"?

Unfortunately, there is really no straight-forward answer. It depends on the athlete and the training itself. Generally, the more intense training requires more time for recovery. For example, the less intense aerobic training requires short recovery time of as little as a few hours while the high intensity anaerobic training takes as long as 48 hours. When training load accumulates, the body may need more time to recover. Younger, less experienced runners may need a longer rest too. Ultimately the coaches and the runners must decide based on the understanding of the above concepts and the individual's body.

Conclusion

Most of us understand the general concept that our performance improves through training. But what is more important is the need to understand that it is only with adequate rest and recovery that our performance really improves after carrying out the training. Without adequate recovery, improvement will be limited. In some instances, athletes may experience a decline in performance and even illnesses or injuries.

So all the "over-zealous" athletes out there: don't hesitate to rest when it is due. After all, between over-training and under-training, at least under-training is less painful!

References

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