

Running speed and Rating of Perceived Effort (RPE) – Peter Sandery

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There is a body of running research that supports the theory that race distance subconsciously determines the speed that you adopt for that race. Of course it does you say, you wouldn't start a 10km race running at 200m race pace would you? Well, it isn't unusual to see some competitors start that way. Just think of what happens at the start of a major road race, with some people seeking their 15 seconds of fame, but they soon drop back to a pace closer to that which they can sustain, usually with some degradation as the race progresses. The issue is what the brain perceives to be a sustainable pace. We seem to have an inbuilt "safety margin speed regulator" that is associated with the tendency of the body to always gravitate towards a situation of greater comfort. Homeostasis is the condition that our physiology always seeks to achieve; it is essentially our "equilibrium" position. Running at, or close to maximum race pace isn't a comfortable state for the body so, even if that pace isn't high enough to cause significant physical damage to muscle tissue, the brain acts to reduce the discomfort unless you consciously counter that tendency.

Exercise induced muscle damage also affects RPE and hence pace. Muscle fibres cannot divide and replace themselves like skin cells or the lining of the intestines, but there are repair mechanisms that respond to the chemical markers associated with cell damage. Like most tissue in our bodies, muscle fibres may be damaged as a result of the demands placed on them by daily activities. Some additional breakdown of muscle fibres will occur as a consequence of training. To achieve a training effect, the demand you place on your muscles has to be sufficient to improve the capacity of those fibres to subsequently respond to that level of demand. That process involves the breakdown and rebuilding of muscle fibres by the repair functions of the muscle cells, a process that takes time – which is why recovery time after intensive training is essential. Athletes with exercise induced muscle damage have a higher RPE when they run at a particular pace than they do when that damage is not present. The mechanism by which the brain is aware of muscle damage involves a chemical that is produced in increased concentration when muscle damage occurs. This chemical triggers the brain to produce a feeling of fatigue, a protection mechanism to encourage the athlete to stop exercising and allow recovery to take place.

There is a clear difference between discomfort and the pain that results from major tissue trauma such as a muscle tear, bone stress fracture, connective tissue damage, etc. Discomfort is an inescapable part of training hard and racing well, activities that are well outside your normal level of exertion. Pain is a signal to stop an activity and to take appropriate action to assist significant tissue injury to be repaired by the body.

So, what does RPE mean in terms of how you train and race? As the name indicates, it is all about perception, how you think about what you are doing. The key to lowering your rating of perceived effort is then to change how you think about the task before you. At the start of a distance race, break the race down into shorter segments and focus on

achieving goals for those shorter distances. As you pass each segment, put what you have done out of your mind and think about the next segment. If you run 5k races, include training sessions such as 5 x 1000m run at your target race pace with relatively short recoveries (around 60-90s) and aim to run each repetition feeling comfortable. This is important – you will not get the desired training effect by trying to run each repetition as fast as possible. The aim is to fix a 5k pace in your mind that is demanding, but one that you perceive to be relatively comfortable and largely aerobic in nature. At the end of each repetition you should aim to be eager to do the next one. Then, in a 5k race, focus on maintaining the pace you have become comfortable with in your training, taking the race 1k at a time.

There are several things you can do to reduce exercise induced muscle damage and hence its influence on RPE. Follow the rule of never increasing combined training volume and intensity by more than 10% per week. Allow adequate recovery time after hard sessions or races. If your program includes two high intensity sessions per week, space them out so that you are not running these sessions with sore and tight muscles. Maintain a daily diet that provides your muscles with the carbohydrate needed for high intensity exercise (around 10-12gm/kg of body mass), protein for muscle fibre repair and fat (in approximately a 55:30:15 ratio, although this will vary with individuals). In the hour immediately following high intensity exercise (and diminishing with time after that), there is a window of increased uptake of carbohydrate (around 1.2gm/kg body weight) to replace muscle glycogen stores and protein (around .4gm/kg body weight) to repair muscle fibre damage. Timing of nutrient intake is important to gain maximum recovery benefit from it.

Above all, set goals and undertake training and racing that allow you to enjoy your running. Feeling good certainly reduces the perceived physical costs of running your fastest.