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Mental fatigue – What is it, what can we do about it, and how can we use it to our advantage?

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Mental fatigue reflects a change in psychobiological state caused by prolonged periods of demanding cognitive activity. This change is gradual and cumulative and has subjective and objective manifestations including increased resistance against further effort, changes in mood and feelings of 'tiredness' and 'lack of energy'. Mental fatigue can be brought about by the sustained performance of a single cognitive task, or a combination of tasks that require mental effort. Tasks which require mental effort extend from studying for an upcoming exam, actively working on being patient with young children, sticking to a diet, or pushing through a tough workout. The symptoms and resulting consequences of mental fatigue are therefore an often common and everyday occurrence.

Predictably, mental fatigue has a detrimental effect on cognitive performance, however, we have recently observed that mental fatigue can also impact aspects of physical performance. Most notably, endurance performance is impaired by mental fatigue, across tasks of running, cycling and muscular endurance, in some instances by up to 15%. Mental fatigue also impairs the performance of skilled physical tasks such as soccer passing and goal shooting, and manual dexterity. Aside from physical performance, mental fatigue also brings about behavioural changes likely to influence general health and well-being including increased impulsivity, a reduced ability to self-regulate and changes in mood and motivation. Indeed, mental fatigue alters the amount of physical effort people are willing to invest in an exercise workout.

In this presentation mental fatigue will be discussed from both an academic and a practical standpoint, relating content to a sporting or performance-based setting, as well as considering the impact of mental fatigue on healthy living. Simple methods to quantify and monitor mental fatigue will be proposed, as well as strategies to minimise the impact of mental fatigue in the short-term and long-term, including the use of caffeine, sleep, motivation manipulation and training interventions designed to improve tolerance to mental fatigue. Lastly, the concept of 'Brain Endurance Training' will be discussed, a novel training method using mental fatigue as a training stimulus.