

THERE IS A RELATIONSHIP BETWEEN INTENSITY OF EXERCISE AND REACTION TIME ON Laterally Concordant and Discordant Stimuli

Abstract

The study investigates a relationship between intensity of exercise and reaction time on laterally concordant and discordant stimuli, respectively. A group of 16 karate performers underwent in different days stepwise exercises on cycle ergometer with initial workload of 100 W increased by 20 W per minute up to exhaustion. During exercise subjects had to press, as fast as possible, the button attached to the cycle ergometer on the left or right handle. In the first case, they pressed the button in accordance with the location of stimulus on the screen, whereas in the second responded on left stimulus with right hand and vice versa. Stimuli were randomly generated by computer-based system FITRO Reaction check, which also measures corresponding reaction time (RT). Prior to the test a measurement of RT in non-fatigue conditions, using the same diagnostic system, was provided. The protocol consisted of 2 sets of 20 stimuli while mean of 16 the best reaction times in better of two trials was taken for the evaluation. Results showed that at the beginning of exercise, at heart rate of about 120 bpm, reaction time slightly decreased (from 351.6 ± 40.0 ms to 330.7 ± 38.2 ms). This phase was followed by plateau in RT (on average 355.4 ± 44.6 ms) from heart rate of about 130 to 155 bpm. As intensity of exercise increased, particularly beyond 160 bpm, also increase in RT became steeper (max 394.0 ± 54.8 ms at heart rate of 180 bpm). However, a significantly ($p \leq 0.05$) greater increase in reaction time (from about 160 bpm) was found when responding on laterally discordant (from 457.0 ± 47.3 ms to 508.4 ± 53.5 ms) than concordant stimuli (from 378.2 ± 43.7 ms to 412.5 ± 48.0 ms). It may be concluded that exercise of moderate intensity contributes to faster responses on visual stimuli, whereas fatigue induced by strenuous exercise is associated with an increase in reaction time.

Key words: *intensity of exercise, reaction time, stimulus-response compatibility*
