

EFFECTS OF AEROBIC EXERCISE AND GENDER ON VISUAL AND AUDITORY P300, REACTION TIME, AND ACCURACY

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Visual and auditory reaction times (RTs) have been reported to decrease during moderate aerobic exercise, and this has been interpreted as reflecting an exercise-induced activation (*EIA*) of cognitive information processing. In the present study we examined changes in several independent measures of information processing (RT, accuracy, P300 latency and amplitude) during exercise, and their relationship to visual or auditory modalities and to gender. P300 latencies offer independent measures of cognitive speed that are unrelated to motor output, and P300 amplitudes have been used as measures of attentional allocation. Twenty-four healthy college students [mean (SD) age 20 (2) years] performed auditory and visual 'oddball.' tasks during resting baseline, aerobic exercise, and recovery periods. Consistent with previous studies, both visual and auditory RTs during exercise were significantly shortened compared to control and recovery periods (which did not differ from each other). We now report that, paralleling the RT changes, auditory and visual P300 latencies decreased during exercise, indicating the occurrence of faster cognitive information processing in both sensory modalities. However, both auditory and visual P300 amplitudes decreased during exercise, suggesting diminished attentional resource allocation. In addition, error rates increased during exercise. Taken together, these results suggest that the enhancement of cognitive information processing speed during moderate aerobic exercise, although operating across genders and sensory modalities, is not a global facilitation of cognition, but is accompanied by decreased attention and increased errors.

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