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MICROGRAVITY-LIKE EFFECTS CAN BE SIMULATED VIA MENTAL IMAGERY: THE CASE OF
WEIGHT ESTIMATION

Abstract

Introduction. Mental imagery can function as an "as-if real" template for rehearsing and modifying behavioral responses. Mental representation of a space environment may thus simulate microgravity-like effects and it should be possible to study how space-like conditions impact on different behavioral responses (e.g., cognition and emotion). Here, in particular, we investigate whether mental simulation of a microgravity-like condition may affect weight discrimination of everyday objects. Methods. A group of 64 undergraduates were recruited. After a baseline measure of participants' ability to discriminate objects' weight (T1), a guided mental imagery session followed (e.g., participants were asked to experience the absence of weight as if they were in space). Subsequently, they were asked to weight again each object from T1 (T2). For the discrimination task, we used a series of 20 everyday objects pictures (e.g., pencil) and participants had to indicate on a 100 gr.-point scale the approximate corresponding weight. Participants were randomly assigned either to the experimental (32, imagery of a space scenario) or to the control (32, imagery of a natural environment) condition. Results. We found that simulation of microgravity via mental imagery impacted on weight discrimination as the mean differential score (T1-T2) was significantly higher compared with that of the control group. Discussion. In line with numerous studies about the power of mental imagery in simulating real scenes, here we first showed that mental imagery can be used to simulate microgravity-like effects. This finding can be crucial for the future of space exploration, for example, in order to understand the extent to which microgravity alone influence vestibular cognition-based tasks and add to the development of countermeasures for long-term duration explorations.