Music enhances self-paced maximal exertion in normoxia and hypoxia.

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Introduction: High altitude is characteristic of a combination of environmental stressors which inhibit performance. Music has ergogenic effects through enhancing psychological factors such as mood and cognition. This study aimed to explore the impact of music as a tool for mitigating the performance decrements observed at altitude. Method: Following ethical approval from Loughborough University, 13 healthy males (mean ± SD; 23.9 ± 4.01 years) completed one familiarisation session and four experimental trials: 1) normoxia (0.209 FiO₂) and no music; 2) normoxia (0.209 FiO₂) with music; 3) normobaric hypoxia (0.13 FiO₂) and no music; 4) normobaric hypoxia (0.13 FiO₂) with music. All conditions were completed at 21°C with 50% relative humidity. Music was self-selected by each participant prior to the familiarisation session. The songs were assessed for their motivational qualities using the Brunel Music Rating Inventory (BMRI-2). Each experimental trial included a 15-min self-paced time trial on an arm bike, followed by a 60-s isometric maximal voluntary contraction (MVC) of the biceps brachii. Supramaximal nerve stimulation was used to quantify central and peripheral fatigue with voluntary activation (VA%) calculated using the twitch interpolation method. Subjective measures included motivation (MS) and mood using the Brunel Mood Scale (BRUMS). Results: Average power output (W) was reduced in hypoxia (p = 0.02) but increased with music (p = 0.001) indicating a non-interactive effect. MVC force (N) was reduced in hypoxia (p ≤ 0.026) whilst VA% of the biceps brachii was increased with music (p = 0.022). MS and BRUMS remained unchanged across all conditions (p ≥ 0.065). Music reduced subjective scores of mental effort, breathing discomfort, and arm discomfort in hypoxia (p < 0.001). Conclusions: Music increased self-paced and maximal physical exertion through enhancing neural drive and diminishing detrimental mental processes. Therefore, music is a viable tool for enhancing performance at altitude.