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The Effects of Self-Selected and Pre-Selected Music on Acute Exercise Perceptions and Performance in Insufficiently Active College Students

Alison J. Bache
Hope College

Tiovanni M. Knight
Hope College

Lazerick T. Smith Jr.
Hope College

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Alison J. Bache, Tiovanni M. Knight, and Lazerick T. Smith, Jr.
Faculty Mentor: Paula-Marie M. Ferrara, Ph.D.
Kinesiology, Hope College

Abstract

Extensive research has investigated the effects of music on exercise. Researchers suggest that music can improve athletic performance and promote positive perceptions of exercise. However, previous research has focused on athletes or recreationally active participants, and often compares the presence of music during exercise to a lack of music. This study aims to determine whether listening to self-selected preferred music versus pre-selected motivational music improves acute exercise performance and perception of exercise in sedentary college students. Ten individuals will complete baseline testing by following the YMCA cycling protocol. Each participant will then complete two subsequent trials in which they will cycle at a resistance corresponding to 85% of their Age-Predicted Maximum Heart Rate (APMHR) until exhaustion. In one of these testing trials the participants will listen to motivational music that has been selected for them, while in the other testing trial participants will listen to music of their choice. It is hypothesized that participants will have a longer time to exhaustion, a lower rating of perceived exertion, and a more positive perception of the exercise protocol during the preferred music condition compared to the motivational music condition. Time to exhaustion and time to 85% of APMHR will be analyzed using a dependent samples t-test. Rating of Perceived (RPE) will be analyzed using Analysis of Variance (ANOVA), and qualitative responses regarding exercise and music perceptions will be analyzed using thematic analysis. Final results will be presented at CURCA 2024 and could allow for the further development of recommendations for sedentary people to increase their enjoyment and regular participation in exercise in the future.

Introduction

As few as 10% of college students have been showed to meet the Physical Activity Guidelines for Adults (7). This has potentially contributed to the high rates of obesity among observed in this population (5).

Music has been well-studied as a means of improving exercise performance and enjoyment of exercise in moderately active individuals (6, 8), when compared to non-music conditions (4). Particularly, "motivational" music can improve performance when combined with a motivational video during exercise (1).

It remains unclear whether it is more beneficial for inactive individuals to listen to standard motivational workout music or to their own preference of self-selected music for workouts. Understanding this distinction may improve exercise behavior and long-term health in insufficiently active college students.

It was hypothesized that individuals in the present study will have a longer time to exhaustion, a lower rating of perceived exertion, and a more positive perception of the exercise protocol during the preferred music condition compared to the motivational music.

Purpose

To determine whether listening to self-selected, preferred music versus pre-selected, motivational music improves acute exercise performance and exercise perceptions in insufficiently active college students.

Methods

Recruitment: Participants were recruited from Hope College Health Dynamics courses (KIN 140) as well as the general student population via announcements in class, emails, and word-of-mouth. Individuals were included in the study if they adhered to the following criteria: a) insufficiently active according to the Godin Leisure-Time Exercise Questionnaire (2), b) physically able to complete exercise, c) did not present with a hearing impairment, and e) ≥18 years old

Data Collection: Participants took part in a baseline session where they completed the YMCA Cycle protocol. During this protocol, resistance at the point where subjects reached their 85% age-predicted maximum heart rate (APMHR) was recorded.

Participants completed two more date collections, both of which involved completing a modified form of the YMCA Cycle protocol, where tempo of pedal rhythm was held constant, but the resistance was set to the resistance that elicited 85% APMHR during baseline testing. Participants were randomly assigned to a self-selected or pre-selected music condition; in the self-selected condition, participants listed to a playlist of music they provided to the researchers, while in the pre-selected condition, they listened to a pre-set playlist of top 10 most motivational songs (3) created by the researchers.

Data Analysis: Descriptive statistics were utilized to describe participants' demographics. A within-subjects, paired sample t-test was used to assess time to exhaustion, time to 85% APMHR, and Brunel Music Rating Inventory scores across both testing conditions. One-way ANOVAs were conducted on heart rate measures and ratings of perceived exertion over time, also over both testing conditions. Significance set at 95% with *p=0.05.*

Results

Table 1. Participant demographics

	Male (n=1)	Female (n=5)	Total (N=6)
Age (years)	22 ± 0	19 ± 1.3	19.7 ± 1.6
BMI (kg/m^2)	25.09 ± 0	24.7 ± 7.4	24.8 ± 6.6
BIA (%)	18.0 ± 0	27.5 ± 11.5	25.9 ± 11
APMHR (bpm)	198 ± 0	200.8 ± 1.3	200.3 ± 1.2
85% APMHR (bpm)	168 ± 0	170.2 ± 0.8	169.84 ± 1.2
Biking Resistance at 85% APMHR (kp)	3 ± 0	2.5 ± 0.5	2.6 ± 0.5

Results

A) T(5)= 1.11, p= 0.16 B) T(4)= 0.95, p= 0.20 C) T(5)= -0.17, p= 0.43

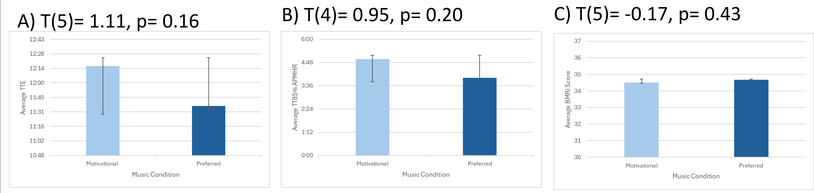

Figure 1. A) Time to exhaustion, B) time to 85% APMHR , and C) music rating during the motivational and preferred music conditions, respectively.

A) F(1,10)=10.88, p=2.85 B) F(1,10)=8.66, p=3.36

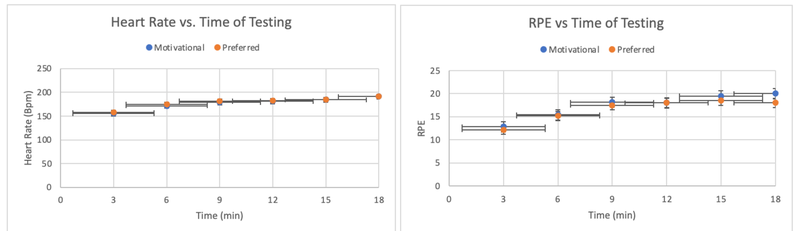

Figure 2. A) Heart rate and B) RPE values recorded during the motivational and preferred music group over time during testing sessions.

Table 2. Participant preferences about music conditions during the biking protocol.

33% Preferred listening to the **pre-selected** motivational music	*"…my preferred choice was music I listened to and enjoy but was not necessarily music that hypes me up when working out."* (Participant 6)	**67%** Preferred listening to their own **self-selected** music	*"I preferred my own because it was music that enjoy to listen rather than just tolerate."* (Participant 4)

Discussion

Anecdotally, participants were observed to have a longer TTE and TT85% APMHR in the motivational music condition compared to the preferred music condition, while heart rate did not change across either one. According to RPE scores, participants perceived to work harder during the motivational music condition. Participants also rated the two conditions of music as being similar in terms of motivation, however preferred listening to their own music over the pre-selected playlist created by the researchers. Overall, no statistically significant findings were found in this study, therefore we fail to reject the null hypotheses, however the nuance in these results imply that future research should be conducted, particularly in a larger sample with the inclusion of a 'no music' condition to adequately understand changes in motivation and performance during exercise.

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