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THE EFFECT OF MUSIC TEMPO ON RUNNING PERFORMANCE IN COLLEGE STUDENTS

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INTRODUCTION

“Despite the well-published benefits of regular exercise, over 40% of adults in the United States do not engage in physical activity (ACSM, 2000),” “understanding what situational factors impact RPE and result in greater exercise enjoyment may prove useful in developing strategies which promote adherence to structured exercise” (Tiev, 2010)

“Music has the ability to distract the mind and is an important way to reduce monotony during exercise” (Silva, 2016)

Many college students listen to music while working out.

Music can serve as a distractor or as a motivating factor during a workout.

It is known that self talk can improve running performance (Miller 2018).

It is known listening to music while cycling will improve power output (Carlier, 2017).

Combined effect of music tempo and loudness on running performance on a treadmill has been studied. Fast/slow music led to improved running performance (Edworthy, 2006).

Effect of music tempo on running performance on a track, which relies on self-pacing, has not been studied.

This study seeks to further the current research by comparing the effect of music tempo on running performance on a track, which relies on self-pacing, has not been studied.

Therefore, we tested the hypothesis that faster tempo music would decrease the RPE (rate of perceived exertion) and decrease mile time.

METHODS

Subjects, Instrumentation and Measurements

The sample consisted of 8 college students (females n=4, males n=4) with an average age of 23 years. Four subjects were randomly assigned the slow-tempo music treatment and four different subjects were randomly assigned the fast-tempo music treatment. Participants came from a convenience sample and selection was biased towards students that can complete an one-mile run.

Apple Watch was used to monitor heart rate (HR) because it is widely used, comfortable, and available for participants.

Participants listened to designated playlist through headphones connected to a music device. Participants came from a convenience sample.

The Borg Rating of Perceived Exertion Scale, measured in RPE, was used to monitor the participants’ exertion during the one-mile run.

Process

• Subjects were asked to come to track for two separate sessions, each lasting at most 30 minutes.
• The two sessions were separated by two rest days to prevent any carry-over effects.
• Subjects were asked to refrain from exercising between testing sessions to avoid risk of fatigue, injury, or alteration of the data.
• Subjects were asked to avoid consumption of caffeine and any medications that would affect their cardiovascular response on the day of testing.
• Upon arrival, each subject’s resting heart rate (HRrest) was obtained.
• Subjects were instructed to stay in the 2nd or 3rd lane and complete eight laps around the track.
• For one session, the subjects listened to their experimental factor through headphones.
• For one session, the subjects did not listen to music while running (control).

Experimental Characteristics

A fast and a slow tempo playlist were created consisting of approximately six songs.

The fast-tempo playlist averaged 183 beats per minute (bpm).

The slow-tempo playlist averaged 79 bpm.

Participants of the same experimental factor listened to the same songs in the same order.

Order of treatment (control or tempo) was determined by randomization.

The inclusion of the participants was 70% of the music device capability, which is equivalent to 55 beats (Lappin 2016).

Upon completion of the one-mile run, time, HR, and RPE were recorded.

RESULTS

Changes for Slow Condition

Time (sec) | RPE | Post HR (bpm)
---|---|---
Subject 1 | -56 | - | -1
Subject 2 | -22 | -1 | -11
Subject 3 | 2 | 0 | -3
Subject 4 | -30 | -1 | -7

Changes for Fast Condition

Time (sec) | RPE | Post HR (bpm)
---|---|---
Subject 5 | 12 | -1 | -1
Subject 6 | -34 | -2 | 3
Subject 7 | -35 | -1 | 3
Subject 8 | -23 | -1 | 4

PERSPECTIVES

The significance of the decrease in RPE in both treatments and the decrease in HR under the slow-tempo are of note. The data for the fast-tempo music treatment supports the hypothesis that it would lead to a decrease in RPE. The limitations of this study include the small size of the sample, the selection of the participants, the interaction of the playlist and the participants’ preferences, and the potential for self-pacing within the indoor track. Despite the present limitations, this study displayed a significant relationship between the presence of music, especially fast-tempo, and the rate of perceived exertion reported by participants. Further research may look into the psychological benefits of listening to music while exercising, for we suspect there were more psychological influences present in the study than initially expected.

REFERENCES


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