The Effects of Music Genre on Cycling Performance and Perceived Exertion

Matthew Richard, Mikalee Rubado, Kendra MoSheridan, Pablo Herrera, Janet T. Peterson, FACSM
Department of Health, Human Performance and Athletics, Linfield College, McMinnville, OR.

Abstract

Many people claim that music enhances their exercise experience. To our knowledge, no studies have analyzed the effect of music genre on exercise performance and perceived effort. PURPOSE: The purpose of this study was to analyze the effect of music genre on performance and perceived exertion. METHODS: Eighteen untrained individuals (7 male, 11 female), age 18 - 22 participated in this study. Participants performed two 25 minute exercise trials on a Monark bicycle ergometer one week apart. Participants were randomized to a music genre (either hip-hop, country or classical) and to condition (music or no music) using a randomized crossover design. The first ten minutes of the exercise trial required the participants to maintain 60% of heart rate reserve. During the final 15 minutes, the participants were asked to cycle as if completing a time trial. Rating of perceived exertion (RPE), heart rate (HR), and resistance were recorded for the first ten minutes, while the same three measures and total calories burned were recorded for the time trial. An ANOVA was used to determine differences between music genres. RESULTS: A test demonstrated no significant difference in RPE between music and no music (p = 0.477). There was a significant difference between music genres for total caloric expenditure (F(2, 17) = 4.13, p = 0.037) during the time trial. The results of the Tukey post-hoc showed a significant increase in caloric expenditure between country music and hip-hop music (p = .006). There were no differences in RPE (F(2, 17) = 1.45, p = 0.265) and music preference (F(2, 17) = 3.21, p = 0.069) across genres. CONCLUSION: Based on these results, exercise performance and perceived effort were similar with or without music. When examining the effects of music genre, listening to country music increased caloric expenditure when compared to hip-hop music. To better understand this relationship, future research should examine differences between music genres while exercising.

Results

Table 1: Demographics for all Participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean ± Standard Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>20.39 ± 0.85</td>
<td>19 - 22</td>
</tr>
<tr>
<td>Height (meters)</td>
<td>1.71 ± 0.12</td>
<td>1.45 - 1.85</td>
</tr>
<tr>
<td>Weight (kg) - Trial 1</td>
<td>76.13 ± 21.09</td>
<td>48.81 - 132.72</td>
</tr>
<tr>
<td>Weight (kg) - Trial 2</td>
<td>75.82 ± 20.52</td>
<td>50.62 - 132.36</td>
</tr>
</tbody>
</table>

Introduction

Studies suggest that listening to music may improve performance or affect psychological mechanisms during exercise (Karageorghis, Terry, & Lane, 1997). While a variety of methods are used to enhance workouts, music is easily accessible and may yield positive exercise outcomes, such as greater number of repetitions or greater intensity. Music preference differs when trying to stimulate the right mood or frame of mind for the task at hand. Because exercise is commonly accompanied by music, it is suggested that athletes find music physiologically and/or mentally stimulating (Madison, Paulin, & Aasa, 2013). Music varies greatly in tempo, content, and overall mood, from classical to heavy metal and hip-hop to country. Specific genres may improve ergogenic and psychological results during a workout (Carpenter, & Potter, 2007). Conversely, simply the presence of music may provide sufficient distraction and enjoyment to yield performance gains. While many studies have focused on tempo of music and exercise, relatively little research has been performed on different genres of music and exercise performance.

Methods

Randomized Crossover Design

- Seven male and 11 female age 18-22 participated in this study.
- Participants performed two cycling trials one week apart one with music and one without (order randomly assigned)
- A randomized crossover design assigned music genre: hip-hop, country or classical.
- Noise canceling headphones were used for all trials.
- 60% of heart rate reserve maintained for first 10 minutes while pedaling at 50-60 revolutions per minute.
- Last 15 minutes the participants cycled as if completing a time trial.
- Rating of perceived exertion (RPE), heart rate (HR), and resistance (Rg) were recorded for the first ten minutes. Total calories burned were recorded for the last 15 minutes.
- Participants asked to rate music enjoyment on 1-10 Likert scale after music trial.
- T-tests determined differences in caloric expenditure and RPE in both trials. An ANOVA was used to determine differences between music genre and non-music conditions.

Discussion

This study demonstrated that exercise performance and perceived effort were similar with or without music. Our findings support the results of Elliot, Carr and Savage (2004), who reported no difference in perceived effort by participants during the course of a cycling trial (Figure 2). Elliot, Carr and Savage (2004) did find that participants traveled further which suggests an increase in exercise performance, whereas our study found no significant difference in work between music and no music (Figure 1). Madison, Paulin and Aasa (2013) found that listening to music while exercising could lead to more weight loss when compared to not having music. When examining specific music genre, listening to country music was associated with an increased caloric expenditure when compared to hip-hop music during a 15 minute time trial (Figure 3). During a strenuous cardiovascular exercise such as cycling, overall had little effect on performance and perceived effort. These results were not expected due to the number people that use music during exercise. There is still little research examining specific music genres and effect on cycling performance. Future research is recommended.

Study Limitations

Study limitations include small sample size and participant recruitment by word of mouth. Another limitation for this study was the automatic resistance adjustment program on the bike computer. The bike computer used the participant’s heart rate to increase or decrease resistance. Several times the computer would not correctly read the heart rate so the resistance adjustments were inaccurate or delayed. Also, the headphones were only noise canceling while music was playing. Participants reported hearing everything in the room when wearing the headphones with no music playing. This may have distracted the participant.

Acknowledgements

We would like to thank Dr. Janet Peterson and Dr. Sarah Coate for advising and helping carry out this study. In addition, thank you to Dr. Garry Killgore and the rest of the HHPA department at Linfield for allowing us to utilize the Human Performance Lab and equipment. Finally, we would like to thank all of the Linfield students who volunteered to participate in this study.

References