The Effects Of Music On A Submaximal Exercise Performance

Author: Ashley Gonzales and Sabrina Garcia, KINE 4400
Sponsor: Judy R. Wilson, Ph.D., Brad Heddins, M.S.
Cardiovascular Research Laboratory, The University of Texas at Arlington, Arlington, TX;

Abstract

INTRODUCTION: Individuals who work out several times a week often use music as a motivation or a distraction. However, will listening to music actually help the individual workout harder and longer or is it just a distraction affecting the intensity of the exercise. It has been suggested that music is more beneficial for longer distances and improves performance by "distracting" the individual who is exercising.

PURPOSE: The purpose of this study was to investigate the effects of music on a 30-minute submaximal exercise test on the cycle ergometer.

METHODS: Five males (age 21.4 ± 1.62 yrs) of the UTA Kinesiology department, volunteered to participate in this study. Each subject had age, height, and weight, recorded. A heart monitor was placed around the chest of each subject so that heart rate could be transmitted to the watch (receiver) to be read during the test. Age-predicted heart rate was calculated and 70% of that number was used during the test. The height of the seat of the cycle ergometer was adjusted so that there was a slight bend (5-10%) in the knee of each subject. The subject was fitted for a mouthpiece and headgear for collecting the expired air. The subject wore the mouthpiece and headgear for the duration of the test for collecting data. Each subject began pedaling at 50 revolutions per minute as a warm up for about 2 minutes until the resistance was adjusted comfortably, then the test started. During each test heart rate (HR), rate of perceived exertion (RPE), and distance traveled were recorded, along with oxygen consumption (VO_2) being collected using the metabolic cart, and calories were calculated.

RESULTS: Between music and no music there was a significant difference in HR, RPE, distance traveled, and VO_2. HR (175 ± 5.05 bpm), RPE (12.9 ± 0.92), distance traveled (8.63 ± 3.4 km), and VO_2 (2.45 ± 0.03 L/min) with music showed statistically significance ($p \leq 0.05$) when compared to HR (164 ± 3.04 bpm), RPE (14 ± 0.71), distance traveled (7.68 ± 0.42 km), and VO_2 (2.301 ± 0.03 L/min) without music. However, there was no statistical significance in calories burned with music (11.94 ± 0.26 kcal/min) and without music (11.43 ± 0.22 kcal/min, $p \geq 0.05$).

CONCLUSION: It can be concluded that during a submaximal exercise test music had a significant impact on bodily functions such as HR, RPE, distance traveled, and VO_2; however, when looking at calories expended it did not affect much.

Purpose

The purpose of this study was to investigate the effects of music on a 30-minute submaximal exercise test on the cycle ergometer.

Methods

Five males (age 21.4 ± 1.62 yrs) of the UTA Kinesiology department, volunteered to participate in this study. Each subject had age, height, and weight were recorded. A heart monitor was placed around the chest of each subject so that heart rate could be transmitted to the watch (receiver) to be read during the test. Age-predicted heart rate was calculated and 70% of that number was used during the test. The height of the seat of the cycle ergometer was adjusted so that there was a slight bend (5-10%) in the knee of each subject. The subject was fitted for a mouthpiece and headgear for collecting the expired air. The subject wore the mouthpiece and headgear for the duration of the test for collecting data. Each subject began pedaling at 50 revolutions per minute as a warm up for about 2 minutes until the resistance was adjusted comfortably, then the test started. During each test heart rate (HR), rate of perceived exertion (RPE), and distance traveled were recorded, along with oxygen consumption (VO_2) being collected using the metabolic cart, and calories were calculated.

Height (in)	Weight (lbs)	Age (yrs)	BMI (kg/m²)
69.2 ± 2.93	162.6 ± 1.62	21.1 ± 1.62	23.74 ± 1.62

Results

Between music and no music there was a significant difference in HR, RPE, distance traveled, and VO_2. HR (175 ± 5.05 bpm), RPE (12.9 ± 0.92), distance traveled (8.63 ± 3.4 km), and VO_2 (2.45 ± 0.03 L/min) with music showed statistically significance ($p \leq 0.05$) when compared to HR (164 ± 3.04 bpm), RPE (14 ± 0.71), distance traveled (7.68 ± 0.42 km), and VO_2 (2.301 ± 0.03 L/min) without music. However, there was no statistical significance in calories burned with music (11.94 ± 0.26 kcal/min) and without music (11.43 ± 0.22 kcal/min, $p \geq 0.05$).

Music					
Time (min)	HR * (bpm)	RPE *	Distance* Traveled (km)	VO_2 * (L/min)	Calories (kcal/min)
10	169 ± 4.12	11.6 ± 2.33	4.44 ± 0.65	2.429 ± 0.37	11.664 ± 1.85
20	174 ± 4.87	13.6 ± 2.24	8.66 ± 1.38	2.497 ± 0.34	12.286 ± 1.97
30	182 ± 7.09	13.5 ± 1.12	12.78 ± 2.60	2.418 ± 0.14	11.857 ± 0.78
Total Average	175 ± 5.05	12.9 ± 0.92	8.63 ± 3.4	2.45 ± 0.03	11.94 ± 0.26

No Music					
Time (min)	HR * (bpm)	RPE *	Distance* Traveled (km)	VO_2 * (L/min)	Calories (kcal/min)
10	161 ± 12.95	13 ± 1.1	3.74 ± 0.21	2.303 ± 0.27	11.121 ± 1.41
20	164 ± 13.97	14.4 ± 1.62	7.66 ± 0.35	2.333 ± 0.32	11.574 ± 1.35
30	168 ± 11.83	14.6 ± 1.5	11.64 ± 0.42	2.267 ± 0.03	11.606 ± 1.32
Total Average	164 ± 3.04	14 ± 0.71	7.68 ± 0.42	2.301 ± 0.03	11.43 ± 0.22

Data are means ± SD; *statistically significant ($p \leq 0.05$).
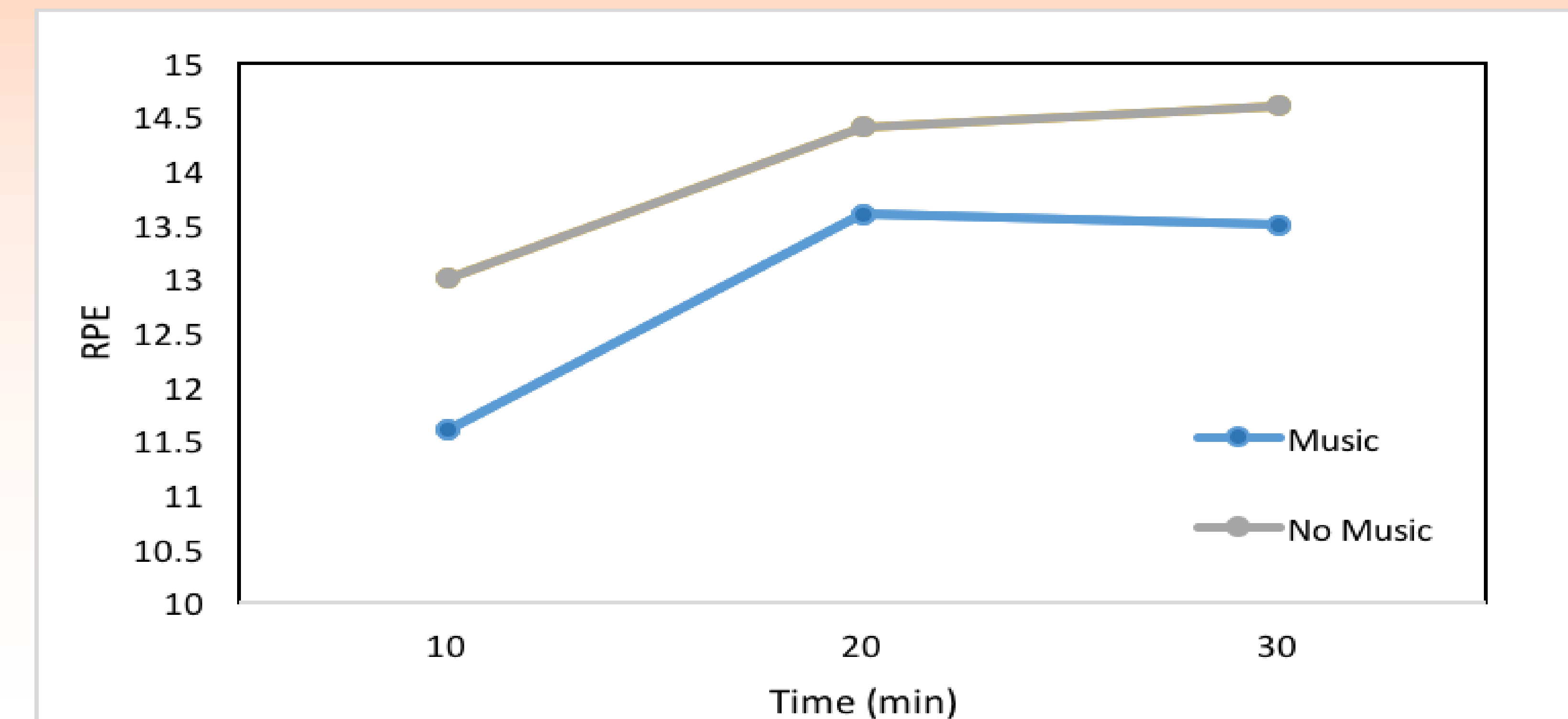
Results (cont'd)

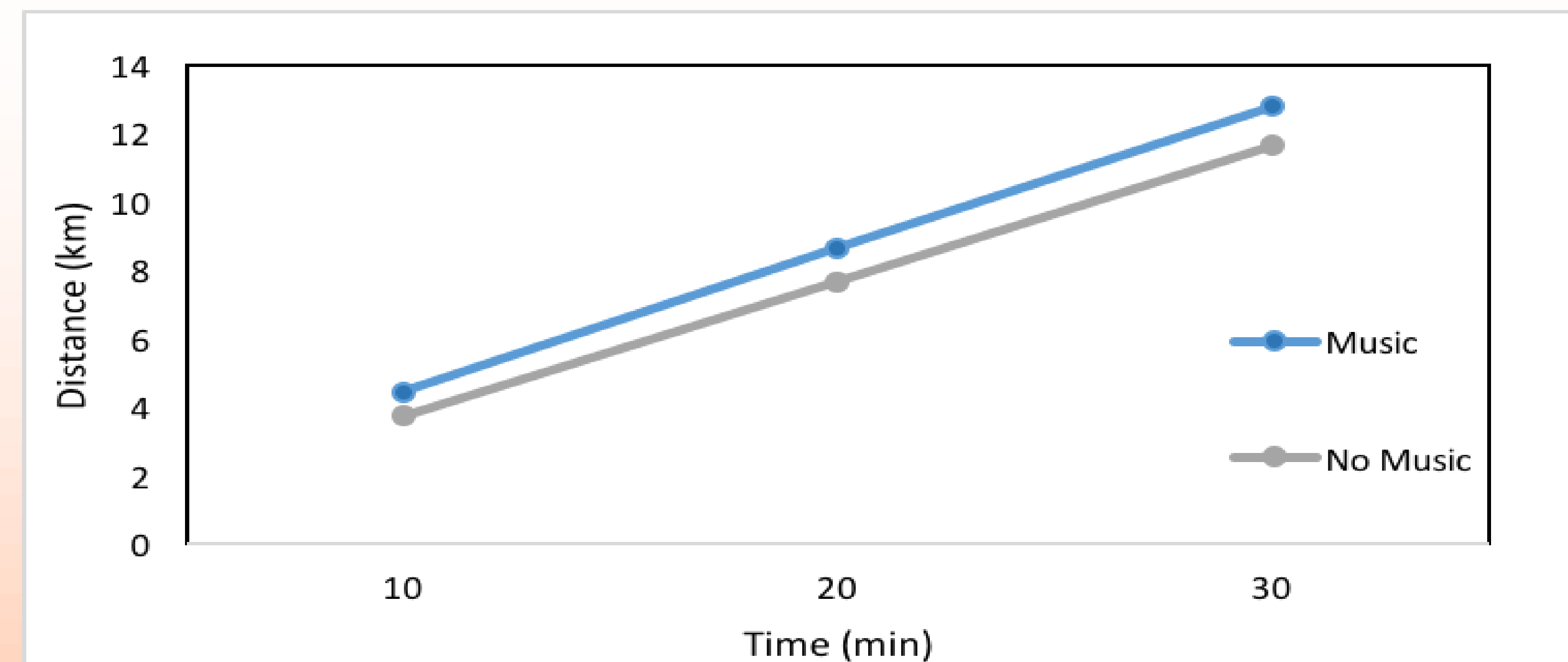Figure 1: RPE With Music vs RPE Without Music

Firgure 2: Distance Traveled With Music vs Distance Traveled Without Music

Conclusions

It can be concluded that during a submaximal exercise test music had a significant impact on bodily functions such as HR, RPE, distance traveled, and VO_2; however, when looking at calories expended it did not affect much.