



THE EFFECTS OF MUSIC ON SUB-MAXIMAL EXERCISE

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Background

In using different variables to understand if Music has any effect on an individual's exercise program can solidify the theory if the motivation is useful towards a submaximal exercise. Studies show that the use of music can change a person's Heart Rate (HR)¹, Rate of Perceived Exhaustion (RPE)², Blood Pressure (BP)³, and Maximal oxygen consumption (VO₂max)³. Research shows that listening to music helps elevate these variables and lowers the heart rate giving the individual a better exercise experience.⁴

Purpose

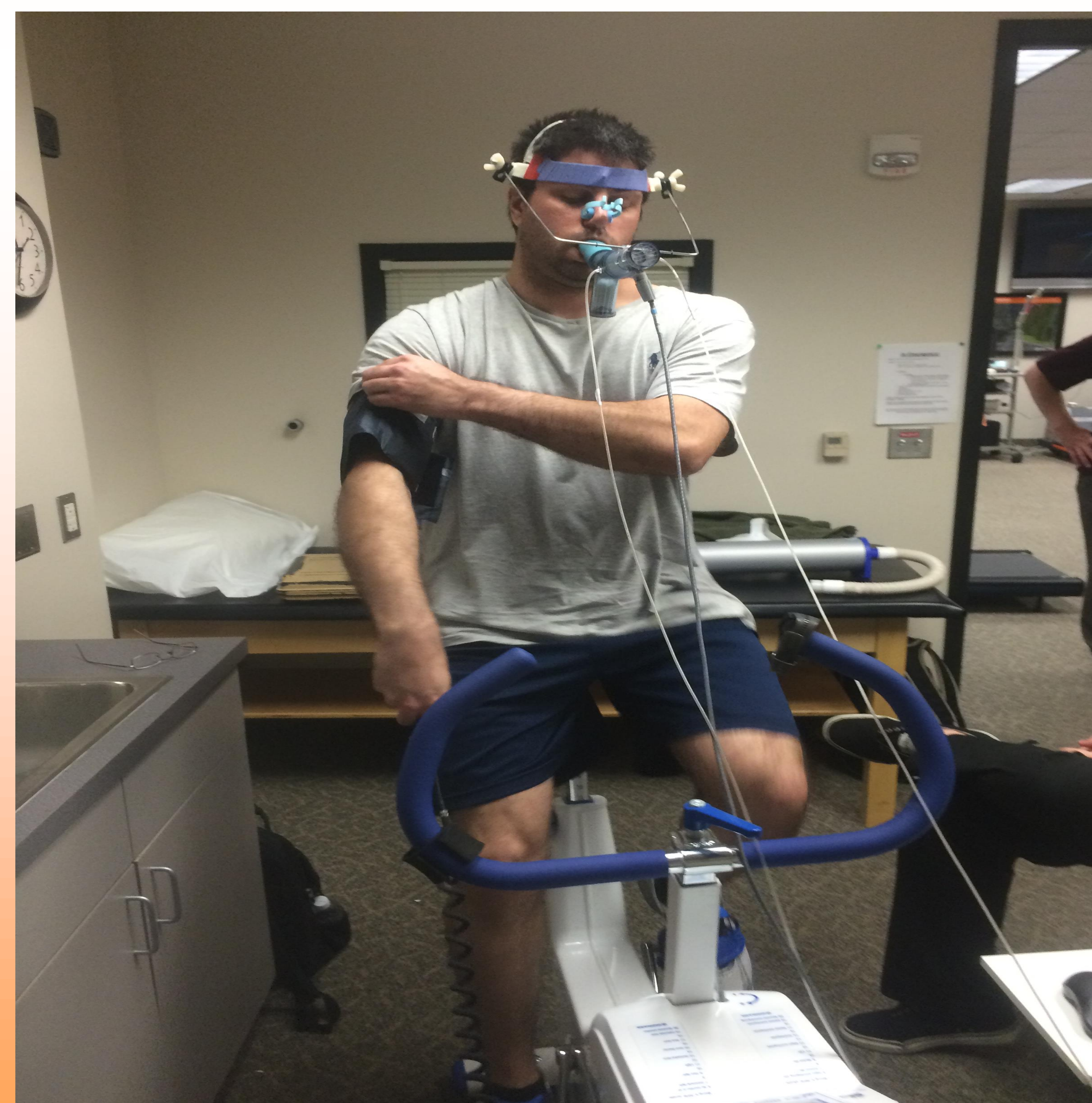
The purpose of this research study is to determine if listening to music or not motivates individuals during submaximal exercise.

Methods

- **Participants:**
 - Six males (age: 22-41 years)
- **Procedures:**
 - Experiment/consent conducted at Exercise Science Laboratories
 - Participants used exercise bike for 30 minutes with 5 minute warm up.
 - Setup: BP cuff around upper arm, HR monitor around the chest, headgear was fitted around head, mouth-piece and nose clip to measure exhaled air (see image).
 - A workload of 70% age-predicted HR max was calculated (220-age (in years) x 70%).
 - Relative VO₂Max, BP, HR and RPE was recorded at 10 minutes, 20 minutes, and 30 minutes.

Methods (cont'd)

- **Outcome Measures:**
 - Physiological measures: VO₂Max, HR, RPE and BP.
- **Statistical Analysis:**
 - Mean (M) and standard deviations (S.D.) were calculated for all physiological measures.
 - Paired sample two tailed t-test was conducted to detect significant changes.



Results

Table 1. Physiological Measures are shown (Mean ± S.D.)

	No Music	With Music	p-value
VO ₂ max (mL/kg.min)	20.5±6.1	24.4±4.7	0.03*
Heart Rate (bpm)	133.1±6.2	132.4±5.3	0.14
RPE	12.7±0.6	12.7±0.7	1
Systolic BP (mm/Hg)	153.9±11.8	153.3±8.4	0.9
Diastolic BP (mm/Hg)	73.3±8.2	77.8±5.4	0.27

*Denotes significant difference between exercising with music versus no music. RPE= Rate of Perceived Exertion; BP= Blood Pressure

There was a significant difference (t(5) = -3.02, p= .03) in the VO₂ Max while participants were listening to music while exercising (24.4, ± 4.7 ml/kg/min), compared to when they did not listen to music while exercising (20.5, ± 6.1 ml/kg/min).

Conclusions

The results of this study indicate that listening to music increased participants' VO₂max compared to no music. This research determines that listening to music while exercising increases maximum rate of oxygen consumption.

References

1. Waterhouse, et al. (2010). Scandinavian Journal of Medicine and Science in Sports.
2. Tiev, et al. (2010) International Journal of Fitness
3. Birnbaum, et al. (2009). Journal of Exercise Physiology.
4. Karageorghis, et al. (2012) Journal of Sport Science.