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The Effects of Self-Selected Music on Strength Training Performance

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Abstract

Music plays an important role in physical exercise performance and may in fact be a contributor to performance enhancement (Bartolomei, Sandro, et al. 2015). Most of the studies done previously examine the effects of music on endurance performance (Brownley, McMurray, et al. 1995 and Waterhouse, et al. 2009). Yet, very little data examines the effects of music on strength performance specifically. As a result, the purpose of this study is to examine the effects of music on strength exercise. We will examine a one rep max (1RM) bench press and the number of repetitions to failure with and without self selected music (SSM). Subjects will complete two weight lifting sessions, that are 6 days apart with the use of SSM or no SSM. SSM will be randomly assigned per session. The subjects will prepare a 30 minute music playlist of songs of their choosing and it will be used when assigned to the use of SSM. Subjects will start with a warm up period prior to testing for both sessions. The data recorded will be force applied, rate of perceived exertion (RPE), number of repetitions, and heart rate for both sessions. Measurements will be taken at the end of the 1RM and at the end of the repetitions to failure. The results will be analyzed using paired T-tests to determine the difference between the variables when SSM is used versus no SSM.

Introduction

The use of music during exercise is profoundly used by a majority of people. When you go to the gym everyone has headphones listening to something which exercising. When you go to the gym or to any sports game, music is always being played. Music has some type of motivating effect on performance. We expect to find that SSM will enhance strength output by decreasing HR, RPE, and increasing force applied.

Questions:

What are the effects of self-selected music on strength performance?

What is the difference of force applied with the use of self-selected music vs. no music during a workout?

Which variable allows the highest physiological output?

Objectives:

- Using a cross over design we are assessing the effects of self-selected music (SSM) on strength performance.
- The participants will perform a 1 repetition max test prior to performing a submaximal bench press in two separate sessions, one consisting of no music and the other consisting of SSM.
- Data collected will be on force applied, RPE, amount of repetitions, and heart rate for both sessions and the results will be analyzed to determine the difference between the variables.

Methods

All subjects completed the following: 2 separate sessions with a 6 day wash out period in between sessions

Session 1:

Randomly assign to NM or SSM group

1. Background Information

- Age
- Height
- Weight
- Sex
- Years of experience
- No Injuries
- Possible estimated 1 repetition bench press max
- Resting heart rate

2. Warm Up

- 3 minutes on the arm cycle ergometer
- 15 reps of I's, T's and Y's
- 10 free weight reps on the smith machine

3. 1 Repetition Max (1RM) Bench Press test

1. Perform 5-10 reps with about half of the estimated bench press max
 2. Rest for 1 minute
 3. Add 30-40 pounds
 4. Perform 3-5 reps
 5. Rest for 2 minutes
 6. Repeat step 3 and perform 2-3 reps
 7. Rest for 2-4 minutes
 8. Repeat step 3 and attempt a 1 rep max
 9. If successful, rest for 2-4 minutes and repeat step 8
 10. If failed, rest for 2-4 minutes, subtract 15-20 pounds and attempt a max repetition
 11. Continue until a max rep is found
 12. 4 minute rest period
 - Measure heart rate, rated perceived exertion and force applied and work in joules (J) after every "set" of reps
- #### 4. Bench Press Repetitions till Failure
- Take 80% of 1RM weight and load bar
 - Repetitions till failure

Session 2:

Assigned to the opposite group of session 1

Follow the same procedure as session 1 as shown above (1.- 4.)



Discussion

Music seems to be used for white noise or as a focusing tool, rather than being used to gain a higher force/work output. In a previous study done, their results stated that 89% of the weightlifters improved the quality of their training with the use of self-selected music, with an increase the volume and intensity (Biagini, Brown, et al. 2012). While testing maximal strength, our observations did show that music may be more of a psychologically motivating stimulus versus having an actual effect on strength performance in regard to being able to lift more weight or prove any significant difference in work output. When testing the repetitions to failure, there may be an increase in performance based on the lifter finding a good working rhythm while listening to self-selected music. In another previous study done, the lack of influence of music on maximal strength could be due to the absence of any rhythmic component in a single repetition with high load. Another aspect that may have reduced the effect of music on performance is the maximal intensity of the 1-RM test (Bartolomei, et al. 2015). The subjects could have made small gains in 6 days' time, but we would also argue that our timing (wash out period) is a restrictive factor in which we cannot afford to offer a longer washout period. If we were to do this differently we would recommend a possible 12-14 day wash out period compared to the 6 days we used.

Limitations of the Study:

Small Sample Size- The most readily available population is college students which limits the amount of participation. Recruitment of only college students also causes the results to be less applicable to the general population.

Equipment and Human Error- The unit used for measurements demonstrated some inaccuracy during tests such as reading the number of clicks inaccurately due to reading the slightest movement of the bar and being able to read/record the data in a timely manner. This was the unit used to measure force applied and work in joules.

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