AFFECTS OF MUSIC ON EXERCISE

Name
Institution

Chapter III: Methodology and Study Procedures

Though there might be studies related to the effects of music on exercise, only few of these (if any) could be claimed to be based on a real life setting. This paper explores on the impact of music (if any) on the everyday exerciser. This study tried to simulate the same variables that someone would experience while performing an aerobic workout. This experiment also aimed to imitate the same intensity that the majority of gym goers participate in, which is, low-intensity calorie burning cardio.

In this study, fifteen male undergraduate students came from the University of Memphis. The age of participants ranged from nineteen to twenty-three (M age = 21.9 years SD = 0.8). In order for the participants to participate in this study, they were required to meet the criteria of exercising. Participating in any physical activity was to take at least thirty minutes for three times a week. Prior to the conduction of the research study, participants filled out a Physical Activity Readiness Questionnaire (PAR-Q), and an "Informed consent" were obtained from each participant, detailing the reasons for conducting the study and what the research experiment expected from them (see Appendix). Participants also filled a post exercise questionnaire (See Appendix) that focused on establishing the effects that the exercise had on the exercisers mental aspect.

The experiment setting took place in an active indoor gym at Memphis's French Riveria Spa, instead of a laboratory setting, to

try to simulate what an everyday exerciser would experience, when he did cardio in the gym. The stationary bike used was a Star Trac 6300 P-UB series with a twenty level resistance, an I-Pulse contact heart rate monitor, which allowed monitoring heart rate, pedals with foot harnesses that allowed the subjects to adjust the straps. It also had a monitor that showed the participants time, revolutions per minute, distance traveled, calories burned, and heart rate during the workout.

The study consisted of two different conditions: the first trial with no music, to try to establish a baseline, and the second trial with up-beat techno music. These two trials in two days focused on providing students with ample time for a full recovery in between the two trials. The two trials incorporated five dependant measures; the rate of the perceived exertion reported by an individual that was calculated based on the 10-point Borg Scale, total distance covered, mean heart rate, average revolutions per minute, and final caloric expenditure. The design aimed at discovering a significant margin on the dependent variable between the two trials. The participants were also instructed not to do any physical activity prior to experiment to ensure that nothing external affected the experiments results.

Just before the first trial, the participant's height and weight was taken to help determine calories expended. The experiment embarked on a five-minute warm -up followed by a stretching session for another five minutes. After the warm up, the participants took their places on the bikes for an initial record of their pulse using the contact heart rate system on bikes. The exercise began with the participants cycling at a constant speed with low intensity at a resistance level of six. The subjects were instructed to consider the distance covered rather than speed. The first trial involved no

music, while for the second trial; the participants had an I-POD MP3 player with the headphones at a comfortable volume, which they chose that only played the moment the trial began. During both trials of the complete twenty minutes of the exercise, the exercisers were continuously monitored, and recordings of the participants' perceived exertion, heart rate and revolutions made per minute were recorded at five minute intervals. The overall distance cycled and expended calories for all participants were recorded at the end of a twenty-minute exercise. After recording everything, the participants took five minutes to calm down.

Chapter IV: Analysis and Interpretation of Results

According to the results from the experiment, the participants when exercising with music covered more distance during cycling. They increased their caloric expenditure, revolutions made per minute, and the mean heart rate compared to when they exercised without music.

Rate of Perceived Exertion (RPE)

Relatively, the experiment recorded no significant RPE differences between the participants exercising with music and those without. The lack of the noticeable differences came about because the participants put in the same efforts in both trials. Also, they kept the constant speed according to the instructions before the start of the experiment. Since there was not a significant difference in the RPE between the two trials, it shows that the music changed the dependent variables rather than individual's efforts. According to other studies done, the RPE varies depending on the fitness level of participants and the ability state of the sensitivity

of their endocrine systems, rather that the influence of music during an exercise (Shepherd & Astrand, 2000). Also, due to the low-intensity exercise and the instructions provided, there was large fluctuation in the RPE between the two trials.

Caloric Expenditure

Comparing the results of these two trials, with music and without it, the analysis showed that while exercising with music the participants burned an average of 202.6 calories (± 12.15). This is a 6.18% increase in calories burned as compared to the less desirable results of 190.8 and (± 11.95) average caloric expenditure of the participants, who exercised without music. These results gave a better explanation to the effects of music during exercises, where the results of the second experiment highlighted the fact that music is significantly fundamental during exercises. The incorporation of music in the gym or during exercises is setting the motivations to the exerciser, pushing harder and sustaining the activity for a longer period than while they were exercising without music. The tempo and music captures the attention of the exerciser and channels both his energy and stimulus to the endurance during the exercise period rather than fatigue and detractive stimulus observed in most individuals that exercise without music (Castleton, 1998). This increased endurance, in return, ensures that the exerciser's input remains either constant or gradually increases according to the tempo of the music. Hence, the individuals who exercise with music are likely to burn more calories, unlike their counterparts who get fatigued and distracted and end up with less input into exercises or give up entirely.

Conversely, listening to music during exercises depends on the tempo of the music. This triggers the increased consumption of oxygen, which contributes to the increased levels of calories

burned. This is because the adequacy of oxygen goes to ensure that the body strikes a balance between the cardiac output and intensity put into exercises, increasing the exerciser's adherence to exercises to lose more calories (Shimomura et al, 1997). Therefore, there is a need for exercise professionals to improve the conditions in the exercising environment, by including music in the exercise setting.

Average Revolutions per Minute

After reviewing the results of the two trials, the participants during trial one (without music) exhibited relatively the same number of revolutions per minute (RPM) during the entire twenty minute exercise. Based on the results illustrated in the graph 1.1 below, the most revolutions during the first trial occurred in the first five minutes of the experiment and gradually declined until the last minute of the experiment. Statistically, this ranged from 69.5 rpm (± 2.42) to 68.69 rpm (±2.26). During the second trial, where participants exercised with music, the results showed that the first five minutes, the average recording was a remarkable number of 71.4 rpm (± 3.44) and increased every five minutes throughout the entire trial. It also had a mean of 74.4 rpm (± 3.70) in the last five minutes of the trial. These outstanding results could relate to the fact that music motivates exercisers by stimulating their adrenalines rush positively; thus, eliminating the exhaustion perception and the depressed state of mind. Music also has attained the best reputation in synchronizing the body to channel the best energy and maintain it throughout the exercise. In this study, the same has been applied because the music aroused the start-up energy for participants in the second trial. Music also helped in maintenance of constant speed. The poor results in the RPM count displayed by participants in the first trial could have been due to the lack of music in their exercise environment that

has gone into derailing their input into exercise. The exhaustion perception minimized the adrenal arousal to keep them energized and focused (Cross, 2004).

Graph 1.1: The comparison of the average revolutions per minute made during the first and the second trials of the experiment.

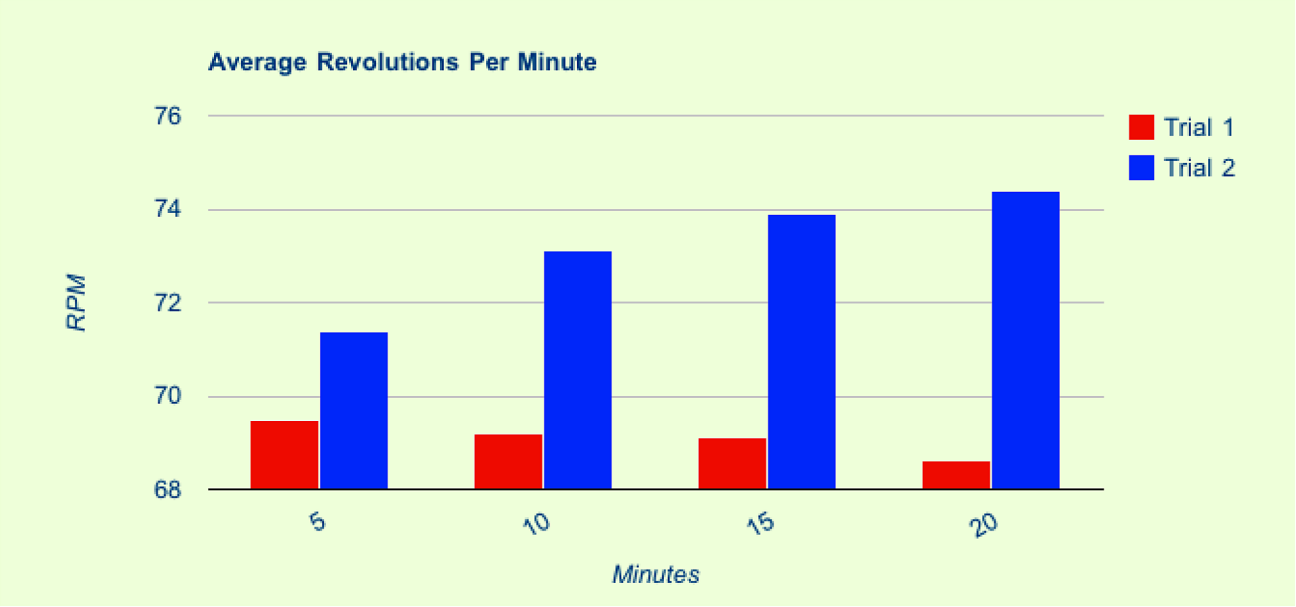
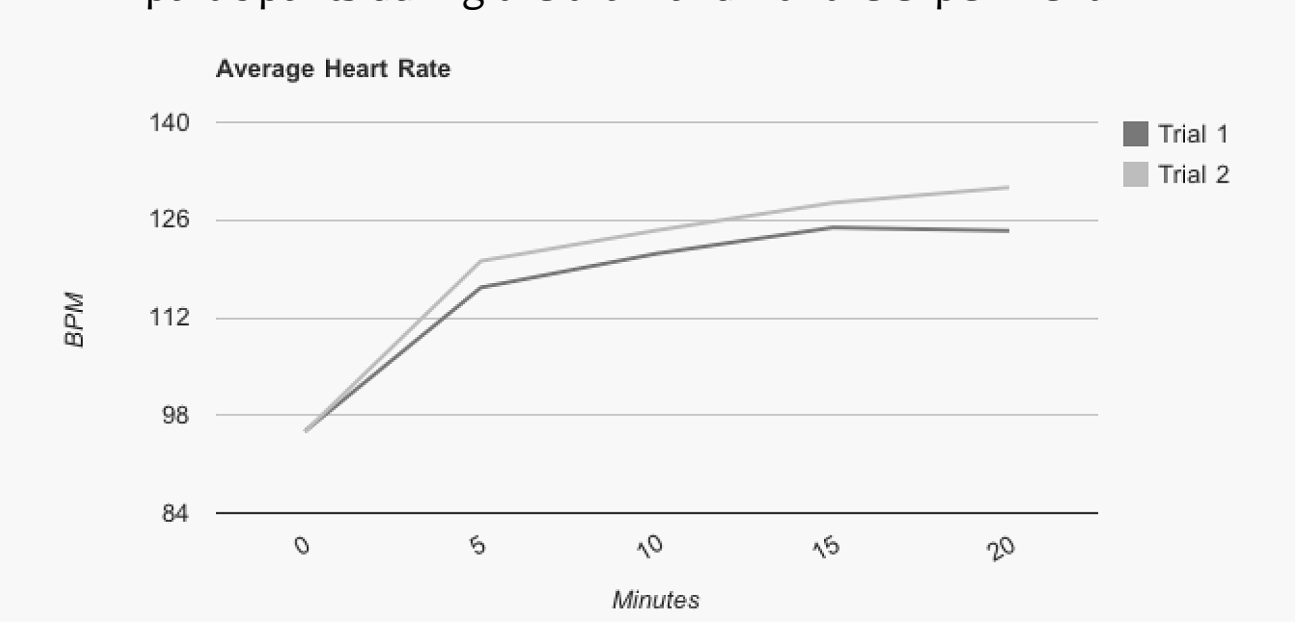


Chart 1: The comparison of the average heart rate exhibited by participants during the trial 1 and 2 of the experiment.

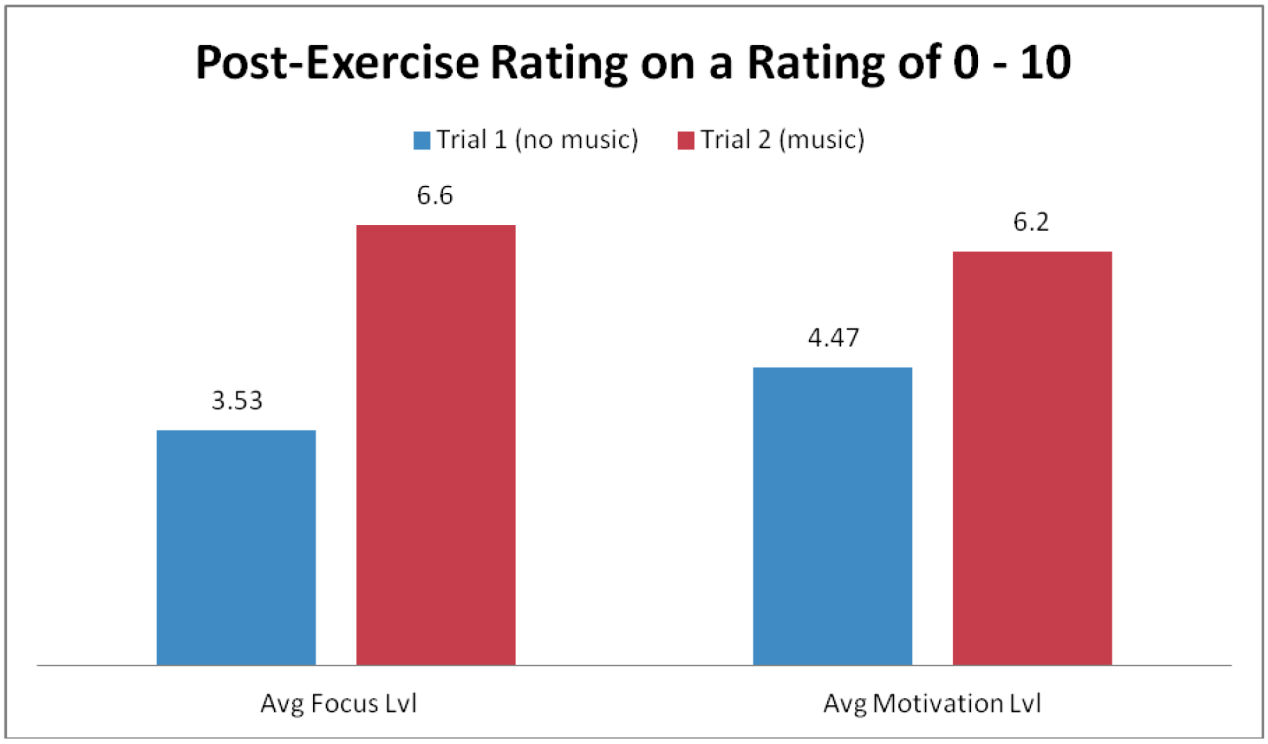


Average Heart Rate

As indicated in the Chart 1 of the illustration above, the study showed that in both trials there was a dramatic increase in mean heart rate during the first five minutes of exercise followed by a gradual heart rate increase every five minutes for the next fifteen minutes. At the fifteen minute mark, the participants' heart rate reached a plateau and remained stagnant during the last five minutes of the trial. Conversely, the participants mean heart rate in the second trial kept rising gradually, till the last minute mark.

The above difference could be related to the positive effect that music has on the Sympathetic Nervous System because music ignites the functions of the autonomous nervous system. The Sympathetic Nervous System, in return, induces an increase in blood pressure leading to more blood being pumped into the heart, which accelerates the heart rate and consequently the resultant high mean heart rate (Shimomura et al.,1997). Therefore, participants lacked motivation to self-stimulate their autonomous nervous system into accelerating their heart beat rate. This is an aspect that was influenced the participants by the music.

Post-Exercise Questionnaire



The Graph 1.2. The comparison of the trials 1 and 2 with the post exercise ratings evaluated by 0-10 scale.

After examining the post-questionnaire that evaluated the thoughts of the exercisers during the two trials, it revealed that the participants exercising without music (M = 3.53 out of 10, ± 1.55) were less focused. Conversely, participants listening to the music (M = 6.60 out of 10, ± 1.64) were a bit focused. It also revealed that the exercisers were less motivated without music (4.47 out of 10, ± 1.68) than those, who exercised with music (6.2 out of ten, ± 1.37).

When the participants were questioned about what they thought of during the first trial, the participants' answers varied remarkably. They said that the result was dependent on the comfort of the seat, exercise styles of others at the gym, attires, school, ending of the task, and the aroma at the gym. During their second trial

with the music, the participants' thoughts ranged from the music's beat and rhythm, which motivated them throughout the session.

According to these results, it is evident that when participants exercised without music, they focused on the surrounding environment rather than the exercise itself. Their concentration was also too low. Conversely, these results indicate that music has the ability to turn an exerciser's attention style from a dissociation style (non-performance-related thoughts to an association style (cadence, breathing, opponents, etc.). In addition, these results indicate that music increased the effectiveness of participants. As many of the participants stated that, they were not depressed while exercising, because of the motivation they got from the music. Also, music served as a very essential tool throughout the period of exercise. On the other hand, the absence of music during the exercise led most participants to being demoralized and most of them were bored and waited for the session to end.

As Cross states from one of his studies, "People have the least power of concentration while exercising because their autonomous nervous system feels less tasked during exercises." (Cross, 2004). Therefore, with the help of music participants are able to exercise with a lot of concentration during the exercise. Individuals exercising in a quiet environment are likely to have distracting thoughts. Incorporating music in exercise channels the exercisers' thoughts to the rhythm of the music (Shepherd & Astrand, 2000). It is worth noting that individuals exercising with music are likely to concentrate more throughout the session as compared to those exercising without music.

Chapter V: Conclusion and Recommendation

The results of this study show that exercising with music is more pleasant and this displays the positive results to the exerciser. The affect of music is, thus, greater compared to exercising without music. The results provide an in-depth the affects that music has on exercises, especially on the exerciser, but regardless of music, some of such variables as the RPE are relatively independent on the music influence. Additonally, music has the ability of determining the attention style of an exerciser from either dissociative to associative in regards to the environment. Furthermore, music can put an individual just in the state or „zone' of exercising; where they are just performing the task, but their conscious mind has drifted somewhere else. Moreover, music has other benefiting effects for exercises such as synchronizing the exercise movements. For instance in an aerobics class, it helps in decreasing the participants' anxiety, while increasing the perspiration. Perspiration is a factor that collectively promotes an exemplary performance during exercises ("Association for International Sports Psychology", 2006).

In this study, if the sample size were substantially larger then the study would have been more beneficial and possibly yielded more results. Due to the small sample size, it was difficult to obtain significant outcome, because of limited participants. For future studies, it would be interesting to see if different types of music would reveal similar results. In addition, a study on whether music can have an effect on a resistance activity would be vital.

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