



## Effect of High Tempo Music on Sweat Rate and Achievement Motivation

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### Abstract

*The purpose of this study was to find out the effect of music on Sweat Rate and Achievement Motivation. To achieve the purpose of the study 30 men physical education students were selected from department physical education and sports, Manonmaniam Sundarnar University, Tirunelveli. They were participated in intercollegiate level. The player's age ranged from 20-25 years. The variables selected for this study were such as sweat rate and achievement motivation. Immediately before and after training test was taken. The collected data were statistically analyzed by ANCOVA. In all the cases 0.05 level significances was fixed. It was concluded that the music group showed significant difference in sweat rate and achievement motivation.*

**Keywords:** Music, Sweat Rate, Achievement Motivation.

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### Introduction

Music is an art form whose medium is sound organized in time. Common elements of music are pitch (which governs melody and harmony), rhythm (and its associated concepts tempo, meter, and articulation), dynamics, and the sonic qualities of timbre and texture. The word derives from Greek word *mousike*, "art of the Muses". Music can improve the psychological state of athletes and create positive ideas. It contributes to athletes' motivation and their resistance against psychological fatigue, thus improving their performance and skill learning. Music acts as an effective intervention for improving psychological and performance-related factors. The beneficial effect of using music in sport and exercise contexts has a long history and a strong intuitive appeal. Music has the capacity to capture attention, lift spirits, generate emotion, change or regulate mood, evoke memories, increase work output, reduce inhibitions, and encourage rhythmic movement – all of which have potential applications in sport and exercise. Considerable effort by researchers has been directed at understanding these effects, although many early studies used poor methods and had no underlying theoretical framework; issues we have addressed in a previous review (Karageorghis & Terry, 1997). Since that review, much new research has been published. The purpose of the present paper is to update theoretical developments, to critically review recent research into the psychophysical and ergogenic effects of music, and to provide examples of evidence-based music interventions

for practitioners.

Studies investigating the effects of music on exercise performance have revealed inconsistent data. Music accompaniment has been shown to improve muscular endurance in the performance of junior high students doing sit-ups (Chipman, 1966) and college women doing push-ups (Koschak, 1975), while it did not enhance the running speed of female youth. In contrast, college-aged males and females were able to walk farther and with less effort when exercising to music as compared to no music (Beckett, 1990). In a well-designed study, Schwartz, Fernhall and Plowman (1990) investigated the effect of music on submaximal bicycle performance with untrained college men and women. Music exhibited no significant influence on any physiological variable measured (aerobic capacity, ventilation, respiratory exchange ratio, heart rate, and blood lactates). In addition, the psychological perception of effort was not altered with or without the music stimulus, although subjects felt they performed better with the music. Another investigation of submaximal intensity walking/jogging on a treadmill showed that subjects had longer times to exhaustion when listening to slow, soft music as compared to loud fast music (Copeland & Franks, 1991).

### Methodology

The purpose of this study was to find out the effect of music on Sweat Rate And Achievement Motivation. To achieve the purpose of the study 35 men physical education students were selected from department physical education and sports, Manonmaniam Sundarnar University, Tirunelveli. They

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were participated in intercollegiate level. The player's age ranged from 20-25 years.

#### Criterion variables

1. Sweat Rate
2. Achievement Motivation

#### Selection of Tests

The present study was undertaken primarily to find out the effect of music on heart rate, and breathe rate. As per the available literature the following tests were used to collect relevant data on the selected dependent variables and they were presented in the table - I.

**Table I.** Test Selection

S.No	Criterion Variables	Test Items	Unit of Measurement
1	Sweat Rate	Weighing Machine	ml/hr
2	Achievement Motivation	Kamlesh's achievement motivation inventory	Scores

Test and retest method was followed in order to establish the reliability of data by using twenty two subjects selected at random. The same persons under similar condition tested all the dependent variables

selected in the present study twice for the subjects. The intra class co-efficient of correlation was used to find out the reliability of the data and the results are presented in Table II.

**Table II.** Intra class co-efficient of correlation on selected dependent variables

S.No	Criterion Variables	'R' value
1	Sweat Rate	0.88*
2	Achievement Motivation	0.86*

#### Results

**Table III.** The summary of mean and dependent 't'-test for the pre and post tests on sweat rate

	WOMG	MG
<b>Pre test Mean</b>	583.73	597.40
<b>Post test Mean</b>	630.47	687.27
<b>'t' test</b>	7.00*	14.74*
<b>Table value required</b>	2.14	2.14

**WOMG**-Without Music Group, **MG**- Music Group

Table III shows that the pre test mean value of Without Music Group, Music Group and control groups are 583.73 and 597.40 respectively and the post test means are 630.47 and 687.27 respectively. The obtained dependent t-test between the pre and post test means on Sweat Rate of Without Music Group and Music Group are 7.00 and 14.74 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.14. The obtained 't' test of experimental groups are greater

than the table value. Hence, it is proved that experimental group had significantly improved the Sweat Rate whereas the without music group did not improve significantly as they were not subjected to any specific music training. Taking into consideration of the pre and post test means on sweat rate, the adjusted post test means were determined and analysis of covariance was computed for experimental and control groups and presented in Table IV.

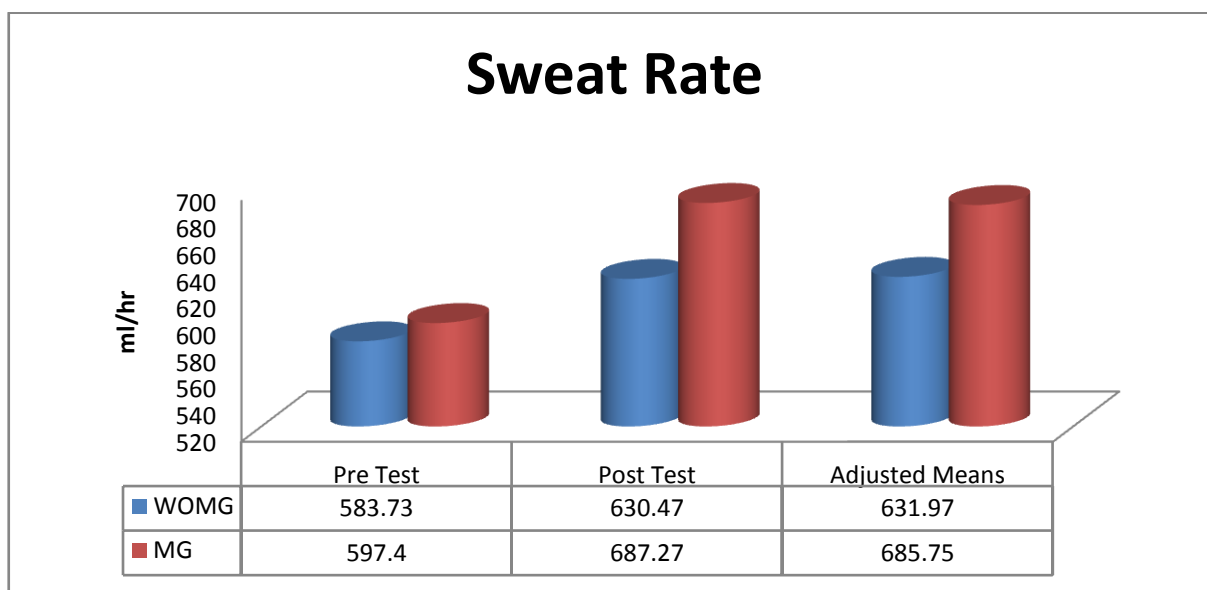
**Table IV.** Computation of analysis of covariance on sweat rate

Adjusted Post Test Means		Sources of Variance	Sum of square	df	Mean squares	F ratio
WOMG	MG					
631.97	685.75	Between	19665.54	2	19665.54	80.33*
		Within	6610.03	27	244.82	

\*significant at .05 level

Table IV shows the adjusted post test means of Without Music Group and Music Group and control groups are 631.97 and 685.75 respectively. The obtained f-ratio of 80.33 which is higher than the table value 3.35 with df 2 and 27 required for significance. The result of the study indicates that there are significant mean differences on Sweat Rate among the adjusted post test means of Without Music Group and Music Group at 0.05

level. Hence it is clear that the training package significantly improved the Sweat Rate of the subjects. Since significant improvements were recorded among the adjusted post test means, the results were further subjected to post hoc analysis using Scheffe's confidence interval test to find out which of the three paired means had a significant difference. The results were presented in Table V.

**Figure I.** Mean values and adjusted post mean values of sweat rate on without music group (WOMG) and music group (MG)**Table V.** The summary of mean and dependent 't'-test for the pre and post tests on achievement motivation

	WOMG	MG
Pre test Mean	26.07	26.67
Post test Mean	32.87	35.20
't' test	11.42*	13.51*
Table value required	2.14	2.14

\*significant at .05 level

Table V shows that the pre test mean value of Without Music Group and Music Group are 26.07 and 26.67 respectively and the post test means are 32.87 and 35.20 respectively. The obtained dependent t-test between the pre and post test means on Achievement Motivation of Without Music Group and Music Group are 11.42 and 13.51 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.14. The obtained 't' test of experimental groups are greater than the table value. Hence, it is proved that

experimental group had significantly improved the Achievement Motivation whereas the without music group did not improve significantly as they were not subjected to any specific music training. Taking into consideration of the pre and post test means on Achievement Motivation, the adjusted post test means were determined and analysis of covariance was computed for experimental and control groups and presented in Table VI.

**Table VI.** Computation of analysis of covariance on achievement motivation

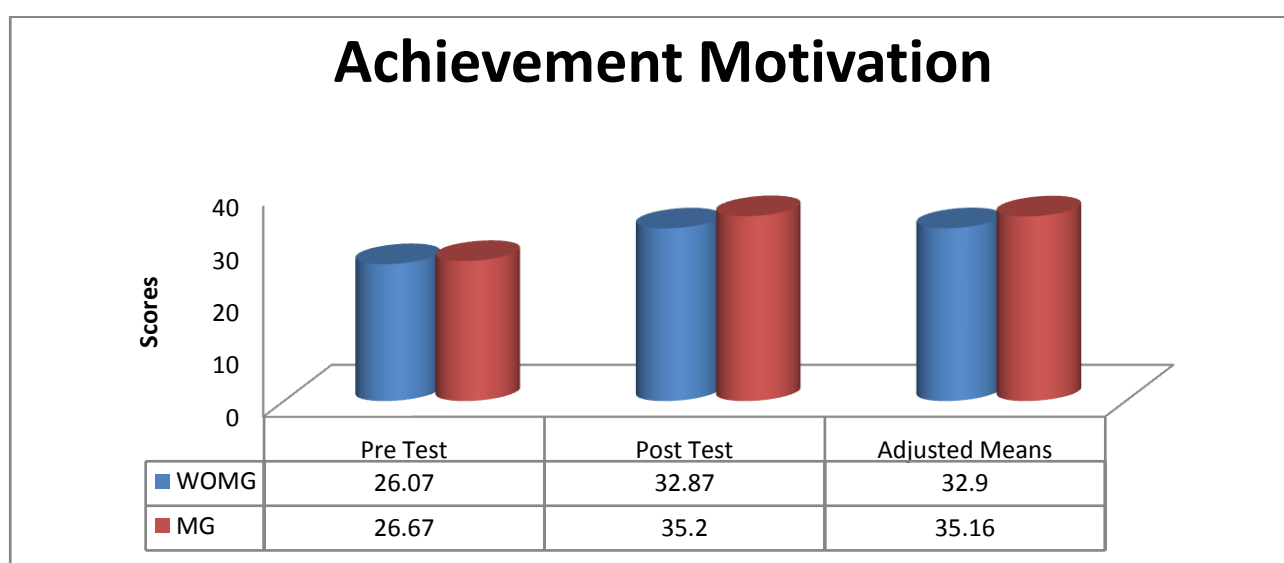
Adjusted post test means		Sources of Variance	Sum of square	df	Mean squares	F ratio
WOMG	MG					
32.90	35.16	Between	37.2	1	37.2	11.89*
		Within	84.45	27	3.13	

\*significant at .05 level

Table VI shows the adjusted post test means of Without Music Group and Music Group and control groups are 32.90 and 35.16 respectively. The obtained f-ratio of 11.89 which is higher than the table value 3.35 with df 1 and 27 required for significance. The result of the study indicates that there are significant mean differences on Achievement Motivation among the adjusted post test means of Without Music Group and

Music Group at 0.05 level. Hence it is clear that the training package significantly improved the Achievement Motivation of the subjects. Since significant improvements were recorded among the adjusted post test means, the results were further subjected to post hoc analysis using Scheffe's confidence interval test to find out which of the three paired means had a significant difference.

**Figure II.** Mean values and adjusted post mean values of achievement motivation on without music group (WOMG) and music group (MG)



### Discussion on Findings

This experiment explored the effect of tempo of music plays on one's exertion during exercise. Participants were asked to exercise for two 8-minute sessions, with and without music. Music was played to participants based on slow (60 bpm), medium (100 bpm), or fast (160 bpm) tempi. Physiological responses to exercise and music were measured and compared to one another to find relationships between tempo and exerted effort. Results suggested participants who listened to music while exercising increased their average heart rate (10 bpm), exerted more effort (burned 7% more calories), and increased perceived exertion by 5%. Specifically, fast and medium tempi increased perceived exertion, while slow music decreased mean arterial pressure during exercise. Future research should continue to focus on personal musical preferences in genre and tempo so as to further investigate how music affects the body physiologically. (Tiffany Jones, Katie Ermatinger, Adam Waite, Han Zhang, 2011)

### Conclusion

It was concluded that the music group showed significant difference in sweat rate and achievement motivation.

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