

## ANALYSIS OF THE ERGOGENIC EFFECT OF ASYNCHRONOUS MUSIC ON PHYSIOLOGICAL, PSYCHOPHYSIOLOGICAL AND PERFORMANCE PARAMETERS OBTAINED IN AN INCREMENTAL RUNNING TEST

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### Abstract

The aim of this study was to investigate the effects of asynchronous music on physiological, psychophysiological and performance parameters obtained from an incremental running test. Ten healthy male individuals were randomly evaluated in two exercise sessions (with or without music during the tests). They were submitted to an incremental running test (3-min stages; initial intensity equal to 7 km.h<sup>-1</sup> and 1 km.h<sup>-1</sup> increments; treadmill inclination equal to 1%). The music's motivation were addressed by the Brunel Rating Music Inventory- 2, considering the most motivation on top of the playlist, and then yours subsequents. Anaerobic threshold intensity (iAnT), blood lactate concentration ([Lac]iAnT) and heart rate (HRiAnT) at anaerobic threshold intensity were considered as physiological parameters. Psychophysiological scales such as Perceived Exertion (PSE<sub>Borg</sub>), Perceived Effort (PSE<sub>Foster</sub>) and Estimation of Time Limit (ETL) were used for psychophysiological analyses. Time to exhaustion (T.T) was considered as performance parameter. No differences were found between iAnT (p=0.248), [Lac]iAnT (p=0.786), HRiAnT (p=1.000) and T.T (p=0.055). However, 70% of the sample presented better performance with asynchronous music was inserted (p=0.003). Significant differences were visualized for PSE<sub>Borg</sub> (AM= ;WM= ;0,042) and ETL (AM= ;WM= ;p=0.015). In summary, for 70% of the evaluated sample asynchronous music exerted ergogenic effect on the physical performance in an incremental running protocol attenuating the psychophysiological responses without changing physiological parameters.

**Key words:** Physiological and psychophysiological parameters, physical performance, asynchronous music

### Introduction

The ergogenic effects of synchronous music (synchronization of the cadence of effort with musical "tempo") on physiological parameters in maximum (JARRAYA et al., 2012) or submaximal (LOIZOU and KARAGEORGHIS, 2015) exercises were demonstrated. However, similar effects were not visualized regarding the asynchronous (absence of synchronization of the cadence of effort with musical "tempo") (KARAGEORGHIS and TERRY, 1997). Therefore, the aim of this study was to investigate the effect of asynchronous music on physiological, psychophysiological and performance parameters obtained from an incremental running test.

### Results and Discussion

Table 1. Comparison between the physiological, psychophysiological and performance responses in music insertion in an incremental protocol performed on the motorized treadmill.

	Without Music	With Music	P<0.5	r (p)	ES
iAnT (km.h <sup>-1</sup> )	12,1 ± 0,8	12,3 ± 1,2	0,248	0,95 (0,000)	0,18
[Lac]iAnT (mM)	3,1 ± 1,1	3,1 ± 0,7	0,786	0,73 (0,015)	0,07
HRiAnT (bpm)	157 ± 11	157 ± 10	1,000	0,79 (0,006)	0,00
T.T (s)	1641 ± 250	1710 ± 269	0,055	0,93 (0,000)	0,26
PSE <sub>Borg</sub> (score)	12 ± 1	12 ± 1	0,042	0,69 (0,026)	0,61
PSE <sub>Foster</sub> (score)	4 ± 1	4 ± 1	0,743	0,69 (0,026)	0,10
ETL (score)	12 ± 3	11 ± 3	0,015	0,90 (0,000)	0,42

iAnT – anaerobic threshold intensity; [Lac]iAnT – blood lactate concentration at the iAnT; HRiAnT – heart rate at the iAnT; T.T – time to exhaustion on the incremental

protocol; PSE<sub>Borg</sub> – Perceived Exertion Scale; PSE<sub>Foster</sub> – Perceived Effort Scale; ETL – Estimation of Time Limit Scale.

Regarding the physiological parameters, similar results, significant correlations and low effect sizes (ES) were visualized for iAnT, [Lac]iAnT, HRiAnT and T.T. On the other hand, 70% of the evaluated sample presented better performance when using asynchronous music (p=0.003). In terms of psychophysiological parameters, significant differences and correlations associated with moderate ES were observed for PSE<sub>Borg</sub> and ETL. Significant correlation and low ES were obtained for PSE<sub>Foster</sub>.

### Conclusions

Asynchronous music exerted an ergogenic effect on the physical performance in an incremental running protocol for 70% of the sample, attenuating the psychophysical responses without altering physiological parameters.

### Acknowledgement



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