

PSYCHO-AFFECTIVE RESPONSES IN MIDDLE-AGED RECREATIONAL RUNNERS TO SELF-ADJUSTING COUNTERCLOCKWISE STIMULI.

Thiago Albernaz ¹
Pedro Augusto Inácio ¹
Fernanda Pereira da Silva Rocha ¹
David dos Santos Nascimento ¹
Adriano Coelho Silva ¹
Silvio Roberto Barsanulfo Junior ¹
Danielly Carrijo Pereira dos Santos ¹
Davi Costa Caixeta ¹
Rafael dos Santos Cardozo ¹
Anne Caroline de Almeida Rodrigues ¹
Alessandro Oliveira de Carvalho ¹
Marcelo Magalhães Sales ¹
Sérgio Machado ³
Alberto Souza de Sá Filho ¹

Introduction

Staying in a training program allows its practitioners to improve in daily activities, generating less energy expenditure to perform them, and in sports practice, executing movements with quality leads to achievements. Nowadays, where the population is increasingly busy and more exposed to technological conveniences, there is a great need for adjustments in training methods, whether for strength, aerobic, power, or flexibility [1].

Adherence to training involves an integrated balance between the mind and body, where the understanding of the physiological impact provided, and how this impact is individually perceived during and after physical exercise, define subsequent human behavior and its potential relationship with adherence to training [2]. The individual understanding of affective responses can be characterized as positive, that is, the perception of stimuli provided well-being and tranquility, and generally reduced tension, or negative, where the brain perceives the offered stimulus as a stressor mechanism, increasing the state of anxiety and tension [3].

We currently know that, primarily, high-intensity interval exercises are being prioritized for training prescriptions within major training centers and gyms [4, 5].

¹ Universidade Evangélica de Goiás (UniEVANGÉLICA). E-mail: doutor.alberto@outlook.com

² Universidade Estadual de Goiás (UEG Campus Quirinópolis)

³ Universidade Federal de Santa Maria (UFSM)

However, while such a mode of exercise can exert potential benefits and rapid physiological changes, when used indiscriminately, it can provide negative affective responses and a possible strain in the practitioners' relationship with physical exercise. A possible solution to this impasse seems to be the self-selection of work speeds by the participants themselves. In this case, no matter how much they are asked and encouraged to take on a high workload, the mere perception of non-imposition and self-regulation can modulate differentiated affective responses, inducing positive interpretations. Despite the empirical nature of this theory, such phenomena still need to be more thoroughly investigated.

Objective

Evaluate the affective responses to time-trial running stimuli with self-selected speeds by recreational practitioners of the modality. Secondly, the comparisons of performance indices between recreational practitioners and athletes will be determined. We believe that despite the high intensity of the requested stimuli, the self-selection of work speeds will allow for ideal adjustments in effort regulation, and in turn, exhibit positive affective responses.

Methods

20 individuals of both genders with a completed higher education, physically active, and non-smokers were invited to participate in the study. A total of three visits were conducted with each subject. The first visit consisted of a maximum progressive effort test to determine VO₂Max. On the second visit, the time limit to exhaustion (TLim) was determined at the fixed speed associated with VO₂Max. On the third visit, the subjects performed a self-paced running protocol in a time-trial model for 2000 m and 1000 m with a 10-minute interval between them, completing them at maximum effort in the shortest possible time. For the last two visits, each subject responded to

two scales (body activation scale, sensation scale) always before and after each test (pre-timer, interval of the 2000 m time trial, post-1000 m time trial).

A descriptive analysis of the data was conducted and presented as mean \pm standard deviation (SD). A Two-Way repeated measures ANOVA was conducted to compare the scores of the activation and sensation scales. An independent T-test was used to compare training parameters (our study vs. athletes).

Results

The T_{Lim} outcomes at VVO₂Max (100%) were lower than those reported in the literature for subjects with a high-performance conditioning level ($p = 0.001$). Table 1 presents the performance outcomes.

Table 1. General Characteristics of Exercise and Performance at Fixed Speed.

Base Variables	VO ₂ Máx	V _{VO₂Máx}	T _{Lim100%} (min)	T _{Lim100%} (min)
#	(mL.kg.min ⁻¹)	(km/h)	Recreacionais	Atletas
Average	48,6	13,5	3,4	5,2*
DP	7,8	2,3	0,9	2,4

Legend: VVO₂Max: speed associated with the moment of occurrence of VO₂Max; T_{Lim100%}: performance response of time limit until exhaustion at VVO₂Max; * significant differences between training levels (recreational practitioners in our study vs. athletes reported in the literature).

Table 2 presents the main affective and activation outcomes of our study. The repeated measures ANOVA showed significant differences between the pre and post-exercise conditions T_{Lim} x 2000m time trial x 1000m time trial ($p = 0.0001$). There were no significant differences between pre-exercise in the three exercise conditions for activation responses (T_{Lim} x 2000m x 1000m – $p = 0.782$), and also when comparing the body activation scale in the post-exercise conditions ($p = 0.129$). However, for the affective responses, significant differences were observed between all the investigated conditions (T_{Lim} x 2000m x 1000m – $p = 0.0012$), demonstrating in this case a positive response to the self-regulated exercise for 2000m and 1000m, but not for the T_{Lim} fixed-speed exercise.

Table 2. Affective and Activation Responses Pre and Post T_{Lim} and Counterclockwise

Affective Variables	T _{Lim}		2000 m		1000 m	
	Pré	Pós	Pré	Pós	Pré	Pós
	Average (DP)		Average (DP)		Average (DP)	
Activation Level	2,0 (1,2)	6,0 (0,1)	2,3 (1,1)	4,6 (0,9)	2,3 (1,1)	5,5 (0,7)
Affective Responses	1,2 (0,5)	-3,1 (1,5)	0,3 (1,1)	2,9 (1,3)	0,3 (1,1)	4,1 (1,0)

Conclusion

We concluded that the counterclockwise stimuli provided positive affective responses during the self-selected high-intensity exercise. However, the same did not occur with the T_{Lim} at fixed speeds. The performance indices between recreational practitioners and athletes are significantly different.

References

- [1] Fiorelli, C.M., et al., Diferente efecto agudo del ejercicio de intervalos de alta intensidad o continuo de moderada intensidad sobre la cognición en individuos con enfermedad de Parkinson. *J Phys Act Health* 2019. 16:157-164.
- [2] Ekkekakis, P., E. Lind, and S. Vazou, Respuestas afectivas a niveles crecientes de intensidad del ejercicio en mujeres de mediana edad con peso normal, sobrepeso y obesidad. *Obesidad (Silver Spring)* 2010. 18:79-85.
- [3] Ekkekakis, P., ¿Dejarlos libres? Evidencia fisiológica y psicológica del potencial de la intensidad de ejercicio auto-seleccionada en la salud pública. *Sports Med* 2009. 39:857-88.
- [4] Gibala, M.J., J.P. Little, M.J. Macdonald, and J.A. Hawley, Physiological adaptations to low-volume, high-intensity interval training in health and disease. *J Physiol* 2012. 590:1077-84.
- [5] Ito, S., Entrenamiento de intervalos de alta intensidad para beneficios de salud y cuidado de enfermedades cardíacas - La clave para un protocolo de ejercicio eficiente. *World J Cardiol* 2019. 11:171-188.