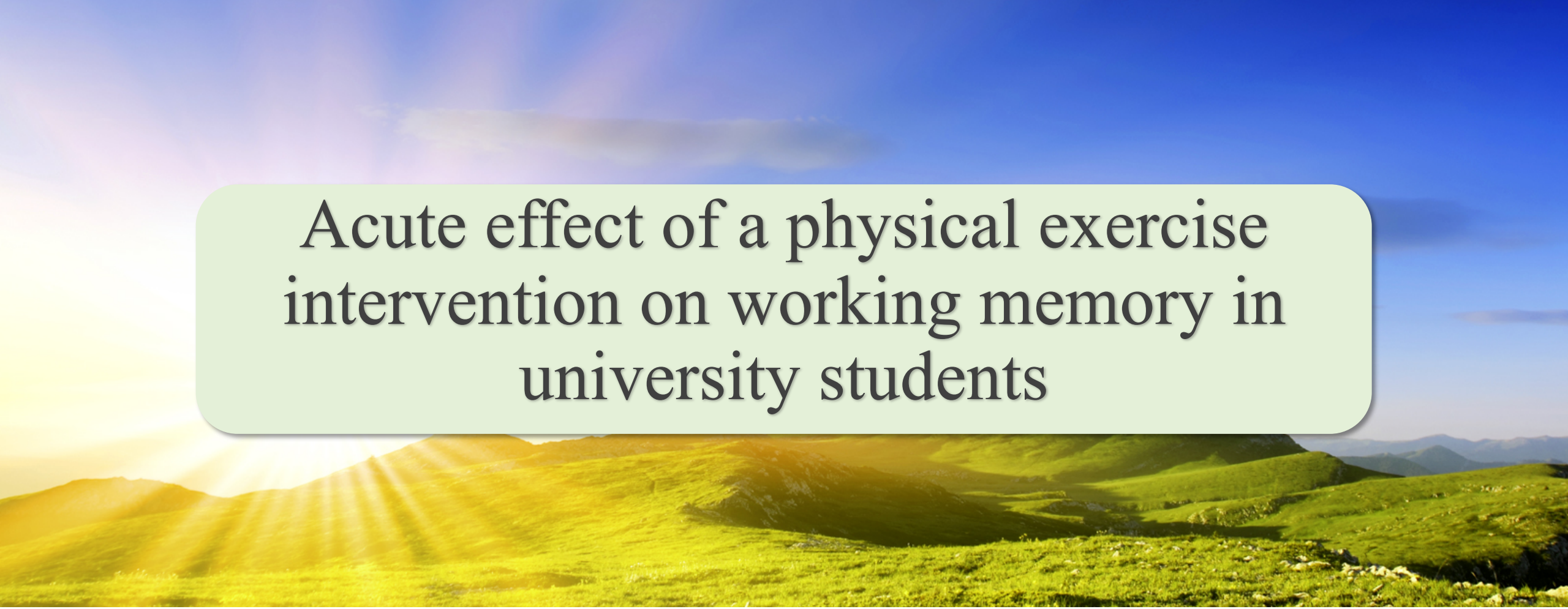

Acute effect of a physical exercise intervention on working memory in university students

Salvador Baena-Morales[1]; Francisco Tomás González-Fernández [2], Daniel Ramos-Pérez[3], Honorato Morente-Oria[4]

[1]PhD Lecturer Department of general and specific didactics. Faculty of Education, University of Alicante (Spain)
[2]PhD Lecturer Department of Physical Activity and Sports Sciences, Pontifical University of Comillas. CESAG, Mallorca. Spain,
[3]University of Málaga (Spain)
[4]PhD Lecturer Didactic of Languages, Arts and Sports, University of Málaga (Spain)

INTRODUCTION

Physical Exercise improves cognitive variables (Álvarez-Bueno et al., 2017; Aubert et al., 2018; Hillman et al., 2011; Lambourne & Tomporowski, 2010)

Physical exercise

Being in nature produces increases in concentration, well-being, attention or working memory (Bodin & Hartig, 2003; Bratman et al., 2015; Lee & Maheswaran, 2011; Pretty, 2004).

Nature

Could they have an additional effect?

METHODOLOGY

Data population

- Thirteen semi-professional athletes and university students

Procedure

- Running 10 kilometers at a rate of between 4.00 min/km and 4.10 min/km. In two environment: natural and urban

Equipment

- Working memory test: Digit Span Backward
- RPE
- GPS

Data processing and statistics

- Tests of normal distribution and homogeneity (Kolmogorov-Smirnov and Levene's, respectively) were conducted on all data before analysis. Wilcoxon test was used for determining within-group differences as a repeated measure analysis (pre-post). Analyses of one-way ANOVAs were used to analyze the DSTA

DISCUSSION

- Natural environment produced significant improvements ($p>0.05$).
- Artificial environment improved the results in the cognitive test, although not significantly.
- The results could be explained by the theory of restoration of attention that natural environments represent (Kaplan,1995).

CONCLUSION

The execution of high intensity and long endurance exercise, has an acute positive effect on performance in the Digit Span Backward. This improvement in working memory is significant when the activity is performed in natural environments

Acute effect of a physical exercise intervention on working memory in university students

Salvador Baena-Morales[1]; Francisco Tomás González-Fernández [2], Daniel Ramos-Pérez[3], Honorato Morente-Oria[4]

[1]PhD Lecturer Department of general and specific didactics. Faculty of Education, University of Alicante (Spain)
[2]PhD Lecturer Department of Physical Activity and Sports Sciences, Pontifical University of Comillas. CESAG, Mallorca. Spain,
[3]University of Málaga (Spain)
[4]PhD Lecturer Didactic of Languages, Arts and Sports, University of Málaga (Spain)

- Álvarez-Bueno, C., Pesce, C., Cavero-Redondo, I., Sánchez-López, M., Martínez-Hortelano, J. A., & Martínez-Vizcaíno, V. (2017). The Effect of Physical Activity Interventions on Children's Cognition and Metacognition: A Systematic Review and Meta-Analysis. *Journal of the American Academy of Child and Adolescent Psychiatry*, *56*(9), 729–738. https://doi.org/10.1016/j.jaac.2017.06.012
- Bratman, G. N., Daily, G. C., Levy, B. J., & Gross, J. J. (2015). Landscape and Urban Planning The benefits of nature experience : Improved affect and cognition. *Landscape and Urban Planning*, *138*, 41–50. https://doi.org/10.1016/j.landurbplan.2015.02.005
- Biddle, S. J. H., & Asare, M. (2011). Physical activity and mental health in children and adolescents: A review of reviews. *British Journal of Sports Medicine*, *45*(11), 886–895. https://doi.org/10.1136/bjsports-2011-090185
- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, *15*(3), 169–182. https://doi.org/10.1016/0272-4944(95)90001-2
- Lambourne, K., & Tomporowski, P. (2010). The effect of exercise-induced arousal on cognitive task performance: A meta-regression analysis. *Brain Research*, *1341*, 12–24. https://doi.org/10.1016/j.brainres.2010.03.091