

Summary and Papers

Within this collection are papers relating exercise at various intensities and conditions with mood and classroom performance in subjects who varied in fitness, age and BMI. General findings with regard to exercise history and weight point to a direct correlation between fitness level and positive affective response (increased energy, euphoria, decreased depression, anxiety) and a negative relationship between BMI and the affective response. Additional papers discussing other predictive factors for subject response, such as genotype and EEG, are included. Animal and human studies analyzing exercise-induced alterations in the signaling of relevant neurotransmitters, such as BDNF, 5-HT and eCBs, are present in order to provide a possible neurological basis for the discussed behavioral changes. I have also added multiple papers concerning experiments that correlated physical activity and sports participation with cognition and scholastic performance in school-aged participants. These papers may help concretize the results of exercise's many effects, including heightened self-appraisal, concentration, and sleep quality. Regulation of these factors could contribute to exercise's reduction of ADHD symptoms, an effect discussed in the Pontifex et. al paper. Two reviews are included to cover some of the main findings, and introduce other relevant performance factors, such as diet.

Annesi, James, Avery D. Faigenbaum, Wayne L. Westcott, and Alice E. Smith. "Relations of Self-appraisal and Mood Changes with Voluntary Physical Activity Changes in African American Preadolescents in an After-school Care Intervention." *Journal of Sports Science and Medicine* 7 (2008): 260-68. Print

Brand, Serge, Markus Gerber, Johannes Beck, Martin Hatzinger, Uwe Pühse, and Edith Holsboer-Trachsler. "High Exercise Levels Are Related to Favorable Sleep Patterns and Psychological Functioning in Adolescents: A Comparison of Athletes and Controls." *Journal of Adolescent Health* (2009): Print.

Bryan, Angela, Kent E. Hutchison, Douglas R. Seals, and David L. Allen. "A Transdisciplinary Model Integrating Genetic, Physiological, and Psychological Correlates of Voluntary Exercise." *Health Psychology* 26.1 (2007): 30-39. Print.

- Burkhalter, Toni M., and Charles H. Hillman. "A Narrative Review of Physical Activity, Nutrition, and Obesity to Cognition and Scholastic Performance across the Human Lifespan." *Advances in Nutrition* 2 (2011): 201S-06S. Print.
- Chomitz, Virginia R., Meghan M. Slining, Robert J. McGowan, Suzanne E. Mitchell, Glen F. Dawson, and Karen A. Hacker. "Is There a Relationship Between Physical Fitness and Academic Achievement? Positive Results From Public School Children in the Northeastern United States." *Journal of School Health* 79.1 (2009): 30-37. Print.
- Donnelly, Joseph E., and Kate Lambourne. "Classroom-based Physical Activity, Cognition, and Academic Achievement." *Preventive Medicine* 52 (2011): Print.
- Ekkekakis, Panteleimon, Erik Lind, and Spiridoula Vazou. "Affective Responses to Increasing Levels of Exercise Intensity in Normal-weight, Overweight, and Obese Middle-aged Women." *Obesity* 18.1 (2009): 79-85. Print.
- Garcia, Danilo, Trevor Archer, Saleh Moradi, and Ann-Christine Andersson-Arnten. "Exercise Frequency, High Activation Positive Affect, and Psychological Well-Being: Beyond Age, Gender, and Occupation." *Psychology* 3.4 (2012): Print.
- Greenwood, Benjamin N., Teresa E. Foley, Tony V. Le, Paul V. Strong, Alice B. Loughridge, Heidi E.W. Day, and Monika Fleshner. "Long-term Voluntary Wheel Running Is Rewarding and Produces Plasticity in the Mesolimbic Reward Pathway☆." *Behavioural Brain Research* (2010): Print.
- Hall, Eric E., Panteleimon Ekkekakis, and Steven J. Petruzzello. "Predicting Affective Responses to Exercise Using Resting EEG Frontal Asymmetry: Does Intensity Matter?" *Biological Psychology* 83.3 (2010): 201-06. Print.

Pontifex, Matthew B., Brian J. Saliba, Lauren B. Raine, Daniel L. Picchietti, and Charles H.

Hillman. "Exercise Improves Behavioral, Neurocognitive, and Scholastic Performance in Children with Attention-Deficit/Hyperactivity Disorder." *The Journal of Pediatrics* (2013): 543-51. Print.

Raichlen, David A., Adam D. Foster, Alexandre Seillier, Andrea Giuffrida, and Gregory L.

Gerdeman. "Exercise-induced Endocannabinoid Signaling Is Modulated by Intensity." *European Journal of Applied Physiology* (2012): Print.

Schneider, Margaret, Andrea L. Dunn, and Dan Cooper. "Affective, Exercise and Physical

Activity among Healthy Adolescents." *Journal of Sports Exercise Psychology* (2009): Print.

Singh, Amika, Leonie Uijtdewilligen, Jos W.R. Twisk, Willem Van Mechelen, and Mai J.M.

Chinapaw. "Physical Activity and Performance at School." *JAMA Pediatrics* (2012):. Print.