

Undergraduate Designed Investigations in the Human Physiology Laboratory

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Extended Abstract

In spring 2013, Human Physiology Laboratory (Biol. 2151) course was created as a requirement for majors in nursing, athletic training, and exercise & sports science at the University of Tulsa. Biol 2151 replaced a one-semester Human Anatomy & Physiology Laboratory for which physiology experimentation was limited due to the emphasis on the anatomical component of the course. With a course completely dedicated to the study of human physiology, I was able to incorporate many of the lessons in human physiology from the BIOPAC Student Lab®, a hardware and software data acquisition system which employs students themselves as the test subjects. It was also possible for students to design their own investigations. This poster is a report of the student-designed physiology experiments which included: differences in motor unit recruitment between athletes and non-athletes (Fig. 1); effectiveness of soothing music and hand warmers as biofeedback treatments (Fig. 2); differences in reaction times between gamers vs. non-gamers and musicians vs. non-musicians (Fig. 3); the influence of temperature on the diving reflex (Fig. 4); and the effect of exercise on pulmonary volumes (Fig. 5). The student-designed approach was enthusiastically received and has empowered students in the planning of their coursework in the laboratory.

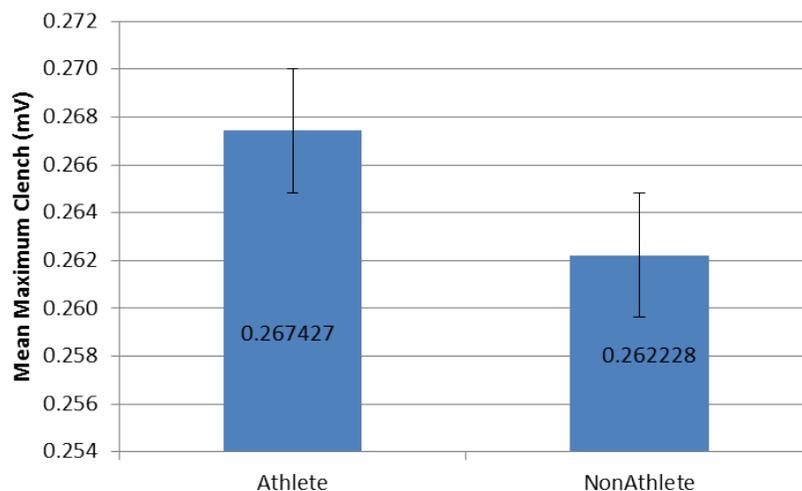
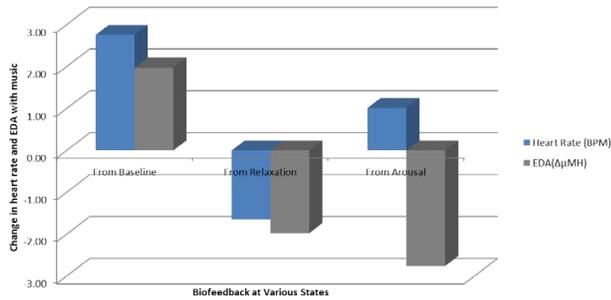
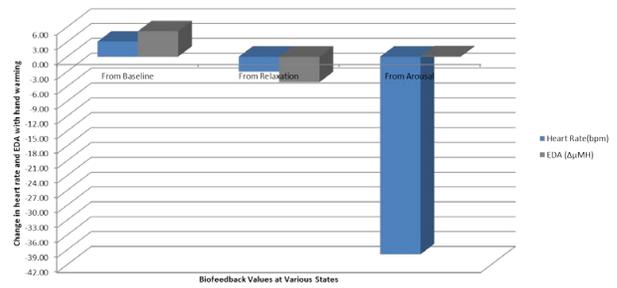


Figure 1. Maximum clench strength in athletes and non-athletes.

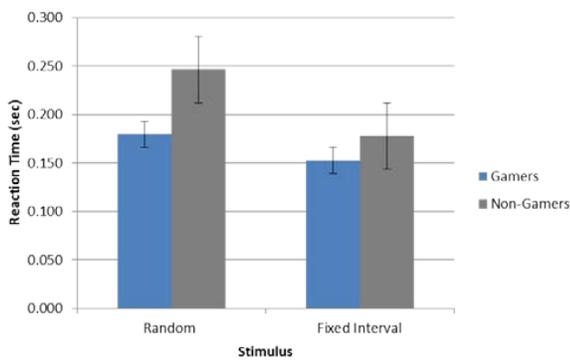


a.

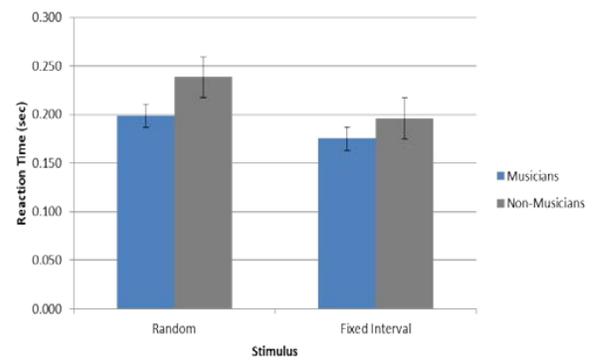


b.

Figure 2. a) Effectiveness of music and b) handwarmers as biofeedback techniques.



a.



b.

Figure 3. a) Reaction times in gamers and non-gamers and b) musicians and non-musicians.

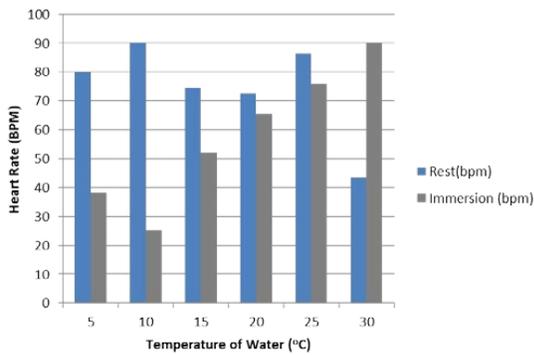


Figure 4. Effect of temperature on the diving reflex

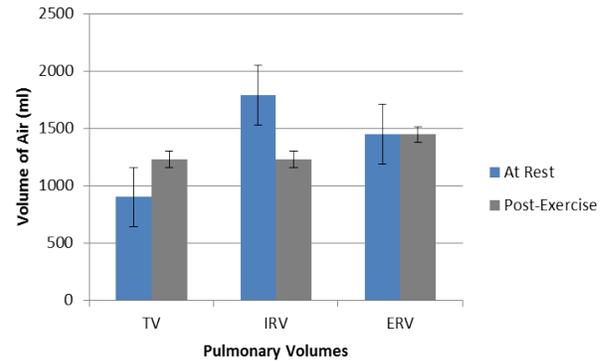


Figure 5. Effect of exercise on pulmonary volumes.

Literature Cited

BIOPAC Student Laboratory Manual. 1998-2010. BIOPAC Systems, Inc. Goleta CA
Lessons: 1 EMG I, 14 Biofeedback, 11 Reaction Time I, 12 Pulmonary Function I, & BSL PRO H08 Diving Reflex
<http://www.biopac.com/h08-dive-reflex>

Keywords: human physiology laboratory, Biopac[®]

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Citing This Article

McMahon, K.A. 2014. Undergraduate Designed Investigations in the Human Physiology Laboratory. Pages 465-467 in *Test-ed Studies for Laboratory Teaching*, Volume 35 (K. McMahon, Editor). Proceedings of the 35th Conference of the Association for Biology Laboratory Education (ABLE), 477 pages. <http://www.ableweb.org/volumes/vol-35/?art=59>

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