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KENT STATE UNIVERSITY

College of Education, Health, and Human Services

DOCTORAL DISSERTATION DEFENSE

of

Emily K. Erb

For the degree of

Doctor of Philosophy

Exercise Physiology

THE EFFECTS OF HIGH-INTENSITY INTERVAL TRAINING AT NORMOBARIC HYPOXIA ON MEASURES OF PERFORMANCE, HEMODYNAMICS, AUTONOMIC MODULATION, AND EXECUTIVE FUNCTION

March 20th, 2024 12:00 p.m. MACC Annex 272 Kent State University

Microsoft TEAMS: https://teams.microsoft.com/l/meetupjoin/19%3ameeting_NTc3MjY0Y2QtNTkzZS00YTBlLTk4ZD QtMDNmMTg0Njc3OWNl%40thread.v2/0?context=%7b%22 Tid%22%3a%22e5a06f4a-1ec4-4d01-8f73e7dd15f26134%22%2c%22Oid%22%3a%222c28a340-eb30-4018-94ce-5b0abf57339e%22%7d

Emily K. Erb

Master of Science in Exercise Science Kent State University, 2020

Bachelor of Science in Kinesiology and Sports Science Youngstown State University, 2018

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Emily is a graduate assistant, University Fellow, and the Executive Chair of Graduate Student Senate at Kent State University. She has taught numerous courses within the field of Exercise Science. Of all courses, her favorite to teach was Exercise Leadership for the Older Adult, as she thoroughly enjoyed building relationships with older adults within the community.

Emily was also a researcher within the Cardiovascular Dynamics Laboratory at Kent State University. She has been a regular student presenter at American College of Sports Medicine regional and national conferences, where she has presented posters, oral presentations, and symposia on topics covering supplementation and exercise, cardiovascular responses to exercise, as well as cognitive responses to exercise.

During warmer seasons, Emily can often be found outside tending to her garden, running, biking, going on walks with her mom, or sitting on a bench in the sunshine with her Baba. Yearround, Emily is also an avid baker. She loves baking sourdough breads, kolachi, and anything with chocolate.

The Effects of High-Intensity Interval Training at Normobaric Hypoxia on Measures of Performance, Hemodynamics, Autonomic Modulation, and Executive Function

The present study sought to determine if high-intensity interval training (HIIT) at normobaric hypoxia (NH) alters measures of executive function, perceived mental exertion (RPE) and recovery (RPR), and hemodynamics.

Ten individuals completed a HIIT intervention at NH (sea level; low NH: 900m; moderate NH: 2500m; high NH: 4300m). Measures of executive function were assessed after ten minutes of rest (Rest 1), 40 minutes of acclimation to NH (Rest 2), and 10 minutes following the HIIT (Post). Additionally, RPE and RPR were assessed at Rest 1, Rest 2, during active recovery (AR) following each bout of HIIT, and Post. Finally, measures of hemodynamics were assessed at Rest 1, Rest 2, each AR, and Post.

There were no condition by time interactions. However, reaction time was significantly faster following HIIT, however, accuracy was unchanged. Further, at AR 6, RPE was increased compared to Rest 1 and Rest 2. Additionally, at AR 6, RPR scores were increased (indicating feeling less recovered) compared to Rest 1 and Rest 2. However, RPE and RPR returned to resting values at Post. Finally, hemodynamics (heart rate, systolic blood pressure, mean arterial pressure, pulse pressure, and rate pressure product) increased following HIIT, while diastolic blood pressure did not change. Collectively, this study suggests NH does not influence executive function, RPE or RPR, or hemodynamics. However, performing HIIT does seem to alter such measures.