IS THERE A MOTOR SKILL PROFICIENCY BARRIER RELATED TO HEALTH-RELATED FITNESS LEVELS IN YOUTH?

*T. Cade Abrams 1 , Bryan M. Terlizzi 1 , An De Meester 1 , J. Megan Irwin 1 , Kirsten Schnieder 1 , and David F. Stodden 1

1 University of South Carolina, Physical Education, Columbia, SC, USA; @email.sc.edu

Introduction: Seefeldt's (1980) hypothesized motor skill proficiency barrier (PB), as it relates to subsequent physical fitness outcomes in youth (Haubenstricker and Seefeldt, 1986), has not been examined. Purpose: To identify a potential PB related to cardiorespiratory (CRF) and musculoskeletal fitness (MSF) in youth. Methods: A convenience sample of 234 youth (123 boys), aged 10-18 years, completed the Motor Competence Assessment battery (Luz et al., 2016). Scores were combined into a composite factor and indexed into percentiles separately for boys and girls. Motor skill levels were categorized as low (≤25 %tile ; moderate (≥26 %tile to p=75 %tile) and high (and ≥75 %tile) to examine their predictive utility in relation to health-related fitness levels (Stodden et al., 2013). CRF was assessed using the Fitnessgram® 20m PACER test. Participants' lap scores were converted to estimated VO2 max and indexed in three levels according to Fitnessgram® standards (health risk, needs improvement or healthy).

MSF was assessed using grip strength standard protocols (IOM, 2012) and categorized as low (≤20 %tile) moderate (≥21 %tile to p=80 %tile), and high (≥80 %tile) using US normative data (Kocher et al., 2019). Two 3-way Chi-square tests were conducted to determine the probability of motor skill classification predicting CRF and MSF level classifications. Results: Chi-square analyses demonstrated statistically significant models; for both CRF ($\chi2$ (4, n=234) = 21.04, p p= .001) and MSF ($\chi2$ (4, n=234) = 24.63, p p= .001). Results support a PB for CRF in that no participants in the low motor skill group (n=23) met the healthy fitness zone for PACER performance. More alarmingly, 87% of low skilled youth were classified in the lowest category of CRF. Additionally, only 27.6%, (8/29), of high skilled youth were classified in the lowest category of CRF. Evidence for a PB for MSF also was fairly strong as only 17% (4/23) of low skilled youth demonstrated high grip strength levels (≥80 %tile); however, 100% high skilled youth (29/29) demonstrated at least moderate grip strength (≥21 %tile). Implications: As health-related fitness in childhood is a strong predictor of fitness levels in adulthood, these data indicate developing adequate motor competence in childhood is a protective factor to mitigate unhealthy CRF and MSF across childhood and subsequent negative health trajectories into adulthood (Stodden et al., 2013).