

follow-ups with a caregiver reported survey. The final sample included 29 families, including children on the autism spectrum (76% male,  $8.36 \pm 3.68$  years) and caregivers (97% female,  $40.55 \pm 8.54$  years). Family participation in the virtual PA sessions each week was lower than expected with attendance of approximately 60%. However, Friedman test results indicated that reported PA levels increased significantly for both children ( $\chi^2 = 14.92$ ,  $p = .002$ ) and caregivers ( $\chi^2 = 14.26$ ,  $p = .002$ ) over the 12-month intervention. Post-hoc Wilcoxon Signed Ranks tests identified the largest gains in reported PA came between baseline and 8-months for children ( $p = .008$ ) and between baseline and 12-months for caregivers ( $p = .001$ ). Despite improvements in both groups, the rank correlation between PA of children and caregivers was low across the intervention ( $r_s = .27-.34$ ;  $p > .05$ ). The virtual PA program was effective for both children on the autism spectrum and caregivers to significantly increase reported PA levels, but improvements can be made to improve program adherence. Funding: Michigan Health Endowment Fund  
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### Associations Between Fundamental Motor Skills and Balance in Elementary School-Aged Children: A Pilot Study

E. Andrew Pitchford, Iowa State University

Fundamental motor skills (FMS) are considered the “building blocks” of more complex movements needed to engage in physical activity. However, there is debate as to whether balance should be operationalized as a FMS or as an underlying or requisite ability. Balance, better defined as postural stability, is the ability to maintain center of gravity within a given base of support. However, much of the balance research in this field has relied on field tests of single-legged stance time. As a starting point to understand better the relationship between balance and FMS, more advanced measurement of postural stability is needed. The purpose of this pilot study was to examine associations between postural sway and FMS from the Test of Gross Motor Development, 3rd edition (TGMD-3). Twenty-seven children, ages 5-10, participated in the pilot study. Children were assessed on FMS competency with the TGMD-3 and postural sway with the BTrackS balance board and software. Postural sway was measured as the 95% confidence interval ellipse area ( $\text{cm}^2$ ) during a 20-second trial. Raw ball skill scores had a significant negative relationship with sway area ( $r = -.57$ ,  $p = .002$ ). The association was stronger for mediolateral sway ( $r = -.50$ ,  $p = .007$ ) than for anteroposterior sway ( $r = -.32$ ,  $p = .099$ ). Locomotor skill scores were not significantly associated with postural sway ( $p > .05$ ), which contrary to previous findings. Relationships were further examined with specific TGMD-3 skills. Significant associations with sway area were observed for the gallop ( $r = -.43$ ,  $p = .024$ ), two-hand strike ( $r = -.55$ ,  $p = .003$ ), one-hand strike ( $r = -.42$ ,  $p = .027$ ), catch ( $r = -.49$ ,  $p = .009$ ), overhand throw ( $r = -.59$ ,  $p = .001$ ), and underhand throw ( $r = -.47$ ,  $p = .014$ ). Higher TGMD-3 scores were associated with less postural sway. The study provides preliminary evidence that ball skills may be related to postural stability, especially mediolateral sway. More research is needed to determine if balance is necessary for proficient motor skills in elementary school-aged children. Funding source: Healthy Weight Research Network.

### Is Motor Competence a Key Factor in Children's Body Composition, Independent of the Method Used for Measuring It?

André Pombo, Instituto Politécnico de Lisboa; Luis Paulo Rodrigues, Instituto Politécnico de Viana do Castelo; Ana Catarina Moreira, Instituto Politécnico de Lisboa; Rute Borrego, Instituto Politécnico de Lisboa; Margarida Machado, Instituto Politécnico de Lisboa; Vânia Costa, Instituto Politécnico de Lisboa; Ana Almeida, Instituto Politécnico de Lisboa; Ana Sofia Tavares, Instituto Politécnico de Lisboa; Cristina Sá, Universidade Federal de São Paulo; Carlos Luz, Instituto Politécnico de Lisboa & Escola Superior de Educação de Lisboa

The increase of sedentary behaviors and a decrease in children physical activity (PA) observed in the last decades led to an increase of the prevalence of overweight and obesity in children worldwide. Most of the investigation on this field focus on components of physical fitness (PF) (cardiovascular fitness and upper body strength), however Motor Competence (MC) has been associated with childhood obesity in several studies. An adequate level of MC is prerequisite for PF and its development can impact lifelong PA habits therefore it's important to understand how these variables behave in different measures of body composition (BC). The aim of this study is to understand if the association of MC and childhood obesity is similar in different measures of BC (Body mass index (BMI), Skinfold and Fat mass in kg) and to determine the role of the different motor skills components (MC, cardiovascular fitness and upper body strength) in this relationship. 181 children with a mean age of 7.93 years ( $SD = 1.28$ ) were evaluated in MC (MCA instrument), cardiovascular fitness (PACER test), upper body strength (handgrip), BMI, skinfold thickness (Slaughter equation) and fat mass weight (value obtained in the slaughter equation converted in kg). Pearson correlations were used to understand the associations between MC and the BC variables, also separate multiple standard regressions were performed to explore the effect of motor skills components in the different measures of BC. MC, cardiovascular fitness and upper body strength were used as independent variables (predictors) and BMI, skinfold thickness and fat mass weight as dependent variable. Overall, the results showed that MC is weak to moderate associated with childhood obesity independently of the measure used for BC (range between  $-.285$  and  $-.316$ ,  $p < .01$ ). Furthermore, only upper body strength and MC were significant predictors ( $p < .001$ ), discarding cardiovascular fitness, independently of the method used for BC. Our results indicate that MC seems to have a similar behavior, in different methods that evaluate BC. Funding source: PI&CA/2021/MCA\_PND & IPL/2021/MCA\_VAL\_ESELx.

### The Use of MRI for Fetal Movement Analysis: An Exploratory Study

Nushka Remec, University of Southern California; Eryn Perry, University of Southern California; Judy Zhou, University of Southern California; Jessica Wisnowski, University of Southern California; Vidya Rajagopalan, University of Southern California; Beth Smith, University of Southern California

Advanced imaging techniques provide a new opportunity to assess fetal motor behavior. Previous studies have documented the successful capture of mid-gestation fetal movement using Cine MR imaging techniques, however a standardized movement criterion has not yet been validated. Our purpose was to quantify the visibility and movement of body segments in a pilot sample of fetal Cine MRI's. Ten datasets were randomly selected from an ongoing study of typically developing fetuses. Fetal gestational age at MRI ranged from 22 weeks to 38 weeks. Duration of sequence and frame rate varied from 50 sec (5 frames/sec; 1 dataset) to 1:23 (3 frames/sec; 9 datasets). ELAN was used for dataset annotation with one researcher identifying segments of head, jaw, trunk, arms, and legs. In order to be coded as visible, segments had to clearly represent their respective anatomy. Unidentifiable segments were labeled as such. A segment was coded as moving (any portion of the segment), or not moving. Excel/MatLab were used for analyses. The percentage of time segments were visible were as follows: jaw 100%, head/trunk 99%, upper extremity 70%, and lower extremity 50%. Unidentifiable segments were seen in 60% of the datasets. Fetal movement was observed in 8 of 10 datasets, with significant variability seen in movement duration and portion of segment moving. On average, fetuses moved 25 seconds per dataset. Average head movement duration was 6.6 seconds (range: 3 seconds to 13 seconds), average upper extremity movement duration was 13.6 seconds (range: 3 seconds to 44 seconds), and average lower extremity movement duration was 4.6 seconds (range: 2 seconds to 15 seconds). In general, segments were