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Title:

Balancing on a slackline: 8-year-olds vs. adults

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Abstract:

Introduction:

Children are less stable than adults during static upright stance (e.g., Schärli, van de Langenberg, Murer, & Müller, 2012; Shumway-Cook & Woollacott, 1985). We investigated whether the same holds true for a task that was novel for both children and adults and highly dynamic: single-legged stance on a slackline.

Methods:

We compared 8-year-olds (n=20) with young adults (n=10) and assessed the following outcome measures: time on the slackline, stability on the slackline (calculated from slackline reaction force), gaze movement (around a visual anchor point), head-in-space rotation and translation, trunk-in-space rotation, and head-on-trunk rotation. 8-year-olds and adults were compared using Mann-Whitney *U* tests for the above described outcome measures.

Results:

8-year-olds fell off the slackline quicker and were generally less stable on the slackline than adults. 8-year-olds also showed more head-in-space rotation and translation, and more gaze variability around a visual anchor point they were instructed to fixate. Trunk-in-space and head-on-trunk rotation did not differ between groups.

Discussion/Conclusion:

The results imply that the lower postural stability of 8-year-olds compared to adults – as found in simple upright stance – holds true for dynamic, novel tasks in which adults lack the advantage of more practice. They also suggest that the lack of head and gaze stability constitutes an important limiting factor in children's ability to master such tasks.

References:

- Schärli, A. M., van de Langenberg, R., Murer, K., & Müller, R. M. (2012). The influence of gaze behaviour on postural control from early childhood into adulthood. *Gait & Posture*, 36(1),
- Shumway-Cook, A., & Woollacott, M. H. (1985). The growth of stability: postural control from a development perspective. *J Mot Behav*, 17(2), 131-147.