

Validation and Reliability of a Video-based, AI-Powered Motion Capture Application for Assessing Motor Performance: A Study Protocol

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Introduction



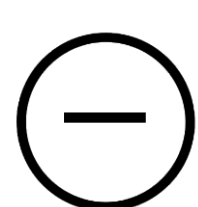
Assessment of motor performance skills (MPS) to identify deficits and potential strengths (Barnett et al., 2016)



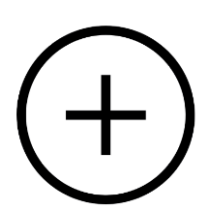
Enables targeted interventions and helps leverage the benefits of well-developed motor performance skills (Barnett et al., 2016)



Collected in physical education, motor development research and health-related studies (Ericsson & Karlsson, 2014, Woll et al., 2025)



Test batteries → limited and subjective information
Markerbased Motion Capture → expensive & time-consuming (Mauntel et al., 2021)



Alternative: markerless video-based, AI-powered motion capture (Young et al., 2023)



Existing apps are available, but none for children and adolescents (Zoeller et al., in Review)

Objective and Research Questions

Validation and Reliability Testing of a video-based, AI-powered motion capture app to assess MPS in children, adolescents and young adults

- 1) Do the app's pose-estimation landmarks match those of the 3D system?
- 2) Does the app correctly evaluate the test results?

References

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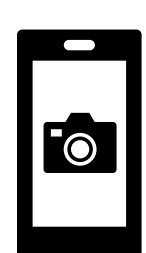
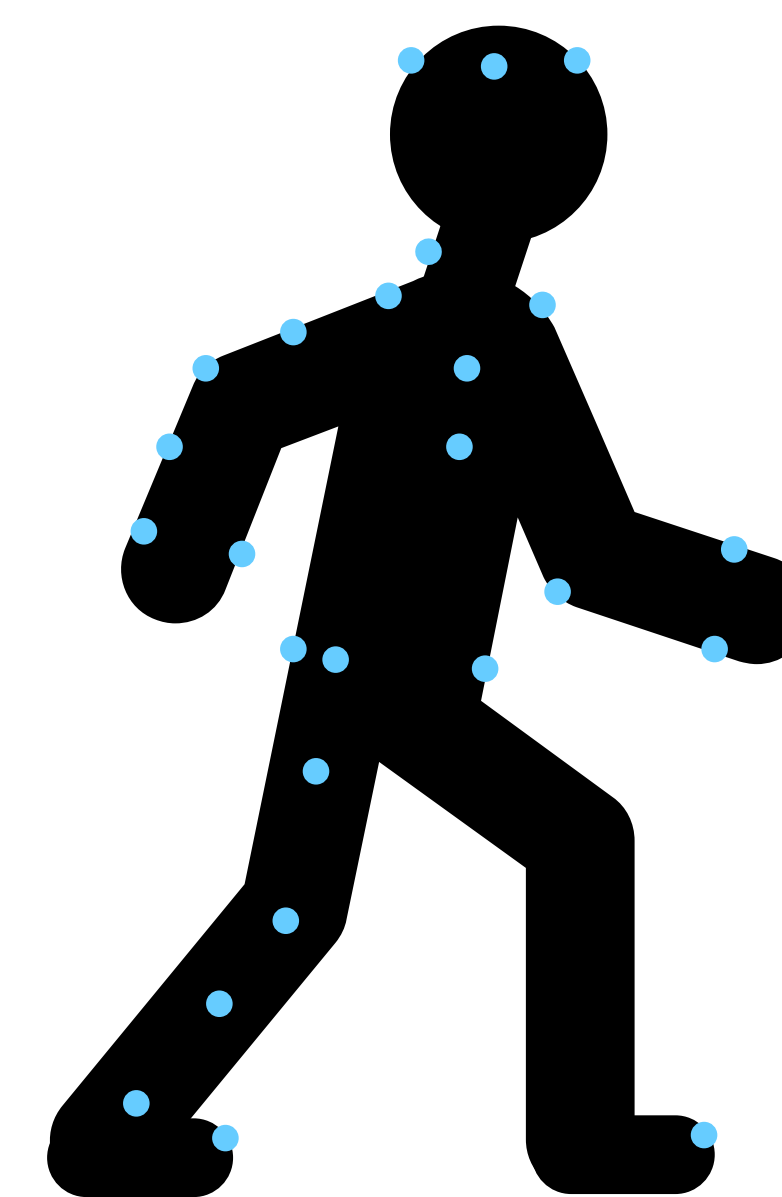
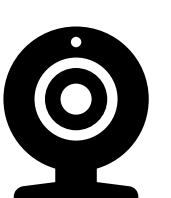
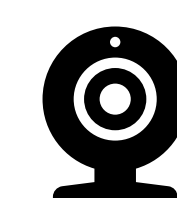
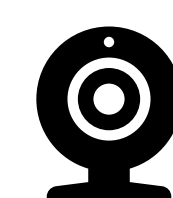
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Icons: PowerPoint and Noun Project

Methods



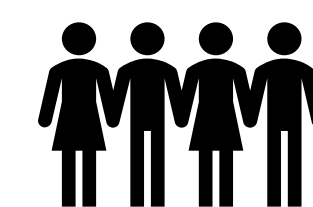
Marker



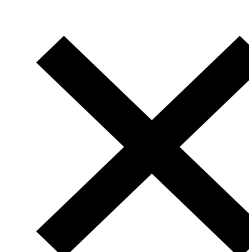
3D Camera System



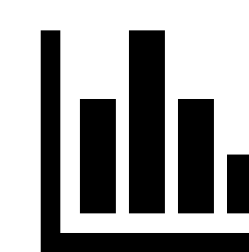
Smartphone camera



20-25 participants
Children, adolescents and young adults



Musculoskeletal injuries at present or within the previous six months

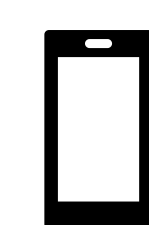


Validation: Pearson correlation
Reliability: Intraclass correlation coefficient

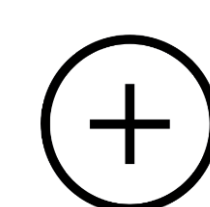
Discussion



New insights into the validity and reliability of a video-based, AI-powered app for assessing MPS



Widespread smartphone availability enables broad access to MPS assessment through an app (Statista, 2024)



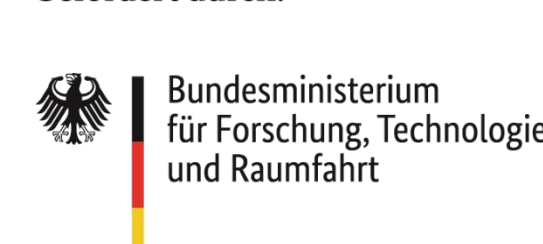
Enables its application in large population-based studies

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Geördert durch:



Funding: This work was developed in the research project "COMO-Study" (2023-2026). The national study on the impact of the COVID-19 pandemic on the physical and mental health and health behaviors of children and adolescents against the background of socioecological contexts in Germany is funded by the German Federal Ministry of Education and Research (funding reference number: 01UP2222).