Establishing normative data for the assessment of the Subjective Postural Vertical using a motorized tilting chair

van der Waal, C. (1), **Embrechts, E. (1,3,4,5), Truijen, S. (1), Saeys W, (1,2)**

1) Reseach Group MOVANT, Department of Rehabilitation Sciences and Physiotherapy, Faculty of Medicine and Health Sciences, University of Antwerp, Belgium
2) Department of Neurorehabilitation, RevArte Rehabilitation Hospital, Edegem, Belgium
3) Rehabilitation Research Group, Department of Physiotherapy, Human Physiology and Anatomy, Vrije Universiteit Brussel, Brussels, Belgium
4) Brubotics (Human Robotics Research Center), Vrije Universiteit Brussel, Brussels, Belgium
5) Helmholtz Institute, Department of Experimental Psychology, Universiteit Utrecht, Utrecht, The Netherlands.

Estimating the orientation of objects or the body relative to gravity is an automatic process in humans. For example, you can instantly recognize when a painting is slightly tilted, that the Tower of Pisa is leaning instead of standing perfectly upright, or that you are standing tilted on a sloped street. However, after a stroke, the ability to perceive verticality can be impaired. Verticality perception refers to the ability to estimate the true vertical position, parallel to the gravitational vector, which is considered 0°. When you have difficulties with accurately estimating the vertical, this could hamper the stroke patient during daily life activities.

During my PhD project, I focus on estimating verticality perception in stroke patients. In this study, we focus on the Subjective Postural Vertical: this measurement can be used to measure an individual's internal sense of body orientation relative to the gravitational vector. When estimating the accuracy of verticality perception, you can measure the deviation from the true vertical in degrees, and also the variability in estimations. In stroke patients, we often see that they are insecure about the vertical position, and therefore are highly variable in their esimations (for example, estimation trial 1 -9° and trial 2 +5° deviation from the true vertical). To differentiate between normal accuracy and abnormal, we evaluated 60 healthy participants.

To examine the SPV, the participant is sitting in a motorized tilting chair which can tilt sideways. The participant can use a remote control to bring the chair from a tilted position, to the perceived neutral position. The examiner uses an inclinometer to see how many degrees the perceived vertical position is tilted from the true vertical position.

With this study, we want to share our insights about normative data of the Subjective Postural Vertial gathered without new developed tilting chair.