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SESSION 1: Eye-tracking technology: Latest developments

Is the Tobii Pro Spectrum a useful tool for microsaccade researchers?

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Throughout the history of eye movement research, the exact properties of microsaccades have been debated (Collewijn & Kowler, 2008). Part of the reason is differences in instrumentation (Nyström et al., 2016). Therefore, the introduction of a new eye tracker to record fixational eye movements should always be followed by careful investigation of its data quality and a comparison against currently used and established tools.

We recorded eye movements from four people with a newly introduced stereo camera eye tracker (Tobii Pro Spectrum, 600 Hz and 1200 Hz) and the standard eye tracker in the field (EyeLink 1000 Plus, filtered and unfiltered) during a fixation task. Microsaccades were clearly visible in both systems, and comparable microsaccade rates and amplitudes were found when applying a standard algorithm for microsaccade detection (Engbert & Kliegl, 2003). Precision, defined as the root mean square (RMS) of intersample distances, was similar across the systems in the horizontal direction. However, vertical RMS was a factor two lower in the data recorded with the EyeLink compared with the Tobii Pro Spectrum, indicating higher precision.

We conclude that the Tobii Pro Spectrum is a useful tool for microsaccade researchers.

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