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SESSION 4: Eye-tracking measures: Fixations, saccades, microsaccades, and pupil size

Is the eye-movement field confused about fixations and saccades?

A survey among 124 researchers

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Eye movements have been extensively studied in a wide range of research fields. While new methods such as mobile eye tracking and eye tracking in virtual or augmented realities are emerging quickly, the eye-movement terminology has been revised only scarcely. Has this caused confusion about at least two of the main concepts: fixations and saccades?

In this study, we assessed the definitions of fixations and saccades held in the eye-movement field, by surveying 124 eye-movement researchers. These eye-movement researchers held a variety of definitions of fixations and saccades, of which the breadth seemed even wider than what is reported in the literature. Moreover, these definitions did not seem to be related to researcher background or experience.

We urge researchers to make their definitions more explicit by specifying all the relevant components of the eye movement under investigation: (1) the oculomotor component: e.g. whether the eye moves slow or fast; (2) the functional component: what purposes does the eye movement (or lack thereof) serve; (3) the coordinate system used: relative to what does the eye move; and (4) the computational definition: how is the event represented in the eye-tracker signal. This should enable eye-movement researchers from different fields to have a discussion without misunderstandings.