Use-dependent plasticity in assistive interfaces:

**Gaze-typing improves inhibitory control**

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Gaze has proven to be an efficient way of controlling a computer interface (e.g. for people with MND). How do we learn to look for the sake of selection rather than for the sake of looking? How does gaze control differ from hand control? We tested novice gaze- and mouse-typists’ saccadic inhibition (anti-saccade task) at the beginning and end of five typing sessions.

**Pre– and post training: Antisaccade task**

Gaze-typing improves the ability to inhibit saccades within five 30 mn sessions.

Gaze and mouse-typing differ the most temporally. To make a correct selection, dwelling times need to be about 150 ms longer with gaze typing. The capacity to plan a movement sequence appears to be lower with gaze too.

The spatial distribution of errors is similar for gaze and mouse typing.

**Training phase: Gaze (N=21) vs Mouse (N=21) typing**

**Anti– and pro-saccade latencies**

Significant interaction between control mode and testing phase ($X^2(1)=18.059$, p<.001) explained by shorter RTs after training in the gaze-control group (see A & B). No effect found on anti- or pro-saccade errors.

**Dwelling time**

Since selection dwelling time was adjusted adaptively, it gives us a measure of performance.

**Letter selection time**

The time it took to select each of the letters of a target word differed between control modes, which could suggest a more limited capacity in pre-planning sequences of eye vs. hand movements.

**Usability: NASA-TLX questionnaire**

Similar subjective workload between control modes along the dimensions of the NASA-TLX, before and after training. Only effort was found to be higher in the gaze-control group post training (p=.01).

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