Fig. 1: Relationship between latency jitter and BCI accuracy for individual sentences with regression lines by subject (left), average accuracy by latency jitter bins (middle), and distribution of latency jitter for subjects with ALS and age-matched controls (right).

Discussion: Our ALS group showed higher incidence of latency jitter than age-matched controls despite a relatively minor level of physical impairment. This raises the concern that with increased impairment, the need to use covert attention for BCI operation would further increase the amount of latency jitter and could make a BCI unusable. While the cause for increased latency jitter in the ALS group is not yet known, it is known that latency jitter is greater with impaired attention [4], which is the most common cognitive symptom of ALS [7].

Significance: The high occurrence of latency jitter among people with ALS and its detrimental effect on BCI performance make development of P300 detection methods that are robust to latency jitter a top priority.

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References