

Temporal stability and training effects in "express saccade makers"

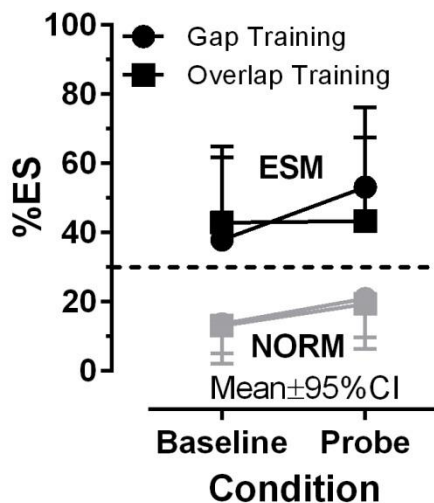
Paul C. Knox and Felicity D.A. Wolohan

Eye & Vision Science, University of Liverpool

A gap between fixation target offset and saccade target onset encourages the production of express saccades (ES; latency 80-130ms). "Express saccade makers" (ESMs) produce almost exclusively ES in gap trials, and in overlap trials (fixation target present when the saccade target appears), a large proportion (>30%) of their saccades are ES. We investigated performance stability in ESM and nonESM participants over time and the effect of repeated exposure to gap and overlap tasks.

Experiment 1. 113 participants (59 ESMs) completed two blocks of 200 overlap trials in the first session (T1). Sixty provided data on a second occasion (T2; 27 ESMs; 200 trials; mean of 87 days later) and 30 provided data on a third occasion (T3; 13 ESMs; 200 trials; mean of 94 days later). Eye movements were recorded using an infrared reflectance eye tracker. For each participant, the percentage of saccades with latencies of 80ms to 130ms (%ES) was calculated for all saccades with latencies between 50ms and 500ms. Participants displayed the same relative performance both within (T1, Block 1 vs 2: ICC=0.97, $p < 0.001$) and between (T1 vs T2: ICC=0.95, $p < 0.001$; T1 vs T2 vs T3: ICC=0.97, $p < 0.001$) sessions, thereby demonstrating high temporal stability.

Experiment 2. We exposed 5 ESMs and 5 nonESMs to repeated exposure ("training") with gap and overlap tasks (administered separately, approx. 6 weeks apart; order counterbalanced). After baseline measurement, gap training consisted of 400 gap trials completed on five consecutive days. Participants returned on day 8 and completed 400 overlap and 400 gap trials ('probe' trials); this pattern was repeated for overlap training.



While gap training produced a small but significant increase in %ES on the overlap task for both groups ($F=11.3$, $p=0.01$; mean increase: ESM=15±11%, Non-ESM=7±10%; see Figure) overlap training did not ($F=1.9$, $p=0.21$; mean increase: ESM=0.4±8%, Non-ESM=6±7%; Figure).

These observations show that the performance of ESMs is stable over time and that the overproduction of ES on the overlap task in ESMs is unlikely to be a product of some environmental exposure.

Citation: Knox PC, Wolohan F (2014) Temporal stability and training effects in "express saccade makers" Program No. 237.07. Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2014. Online.