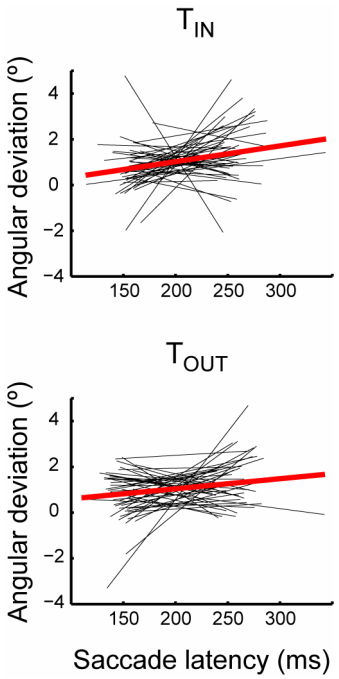
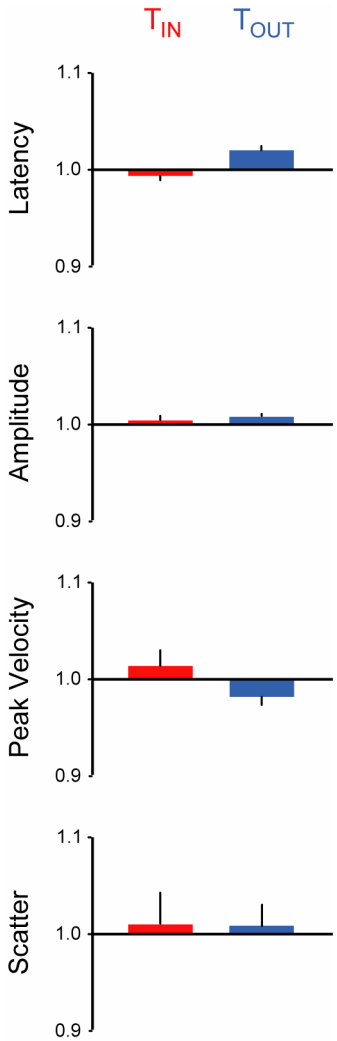



**Supplemental Figure 1.** Regression of angular deviation against saccade latency.

The slope and offset of each black line represent the regression of angular deviation against latency for saccades to TIN (top) and TOUT (bottom) from a single one of the 47 experiments. The angular deviation of a saccade is defined as the difference in the direction of grating motion between the saccade trajectory angle (in degrees θ) and the angle of the median trajectory of all saccades to the same target during both directions of grating motion. Positive deviations indicate differences in the direction of motion. The range of each black line along the abscissa is the mean saccade latency +/- two standard deviations. The red line in each panel is specified by the mean slope and offset of all black lines. For TIN regressions, the mean slope +/- standard error was 0.0069 +/- 0.0030°/ms (Student's t-test, $p < 0.05$). For TOUT, the mean slope was 0.0044 +/- 0.0023°/ms (Student's t-test, $p = 0.06$). For both targets combined, the mean slope was 0.0056 +/- 0.0019°/ms (Student's t-test, $p < 0.005$).




**Supplemental Figure 2.** Effect of FEF stimulation on saccade metrics.

Bars show the mean effects of microstimulation across 47 experiments on four different saccade metrics, each normalized to the corresponding metric on control trials. Error bars are +/- one standard error.