with tips >1 indicate the saccade was hypermetric with electrical stimulation of the SNr.

The analysis of the 60 stimulation sites described above revealed 2 important findings. First, whereas visually-guided saccades were influenced by SNr stimulation, the effect of SNr stimulation on saccades was more profound for memory-guided saccades (cf., Figure 5c and b). The changes seen in saccades were comprised of saccade vector rotations and changes in saccade vector length. Visually-guided saccades, if altered, tended to be rotated contralaterally or away from the side of stimulation. Memory-guided saccades were rotated contralaterally, but also ipsilaterally. For visually-guided saccades changes in saccade amplitude were rare, but evident, whereas for memory-guided saccades SNr stimulation produced mainly hypometria (vector tips < 1) but also hypermetria (vector tip > 1).

To confirm these results across our sample of stimulation sites quantitatively, we also plotted the distribution of angular and amplitude differences measured with and without stimulation in the visually-guided and memory-guided trials in linear form (Figure 6). The average amplitude ratio of visually-guided saccades in the stimulation trials compared to the no stimulation trials across all stimulation sites was 0.98 (Figure 6a). This value, very close to 1, indicates that visually-guided saccades overall, were little affected in length by SNr stimulation. Memory-guided saccades in contrast, had an average normalized length ratio of 0.91 (Figure 6b), indicating a 9% reduction, on average, in saccade length with SNr stimulation. Comparing the two distributions indicated that this difference