**Persistent neural activity in parietal cortex tracks attractor dynamics in visual working memory**

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One important neural hallmark of working memory is persistent elevated delay-period activity in parietal cortex. In human fMRI, delay-period BOLD activity in parietal cortex increases monotonically with memory load and asymptotes at an individual’s capacity. Previously, we have demonstrated the correlation between parietal delay-period activity and behavioral memory precision as a function of memory load. However, because memory precision can be influenced by a variety of factors, it remains unclear what cognitive processes underlie persistent activity in parietal cortex. Recent psychophysical work has shown attractor dynamics biases memory representations toward a few stable representations and reduces the effect of internal noise. Imprecision in memory thus reflects both drift towards stable attractor states and random diffusion. Here we asked whether delay-period BOLD activity in parietal cortex tracks the strength of attractor dynamics in working memory. We analyzed data from three different experiments in which participants performed delayed recall for motion direction or for line orientation, at different memory loads, during fMRI scanning. We modeled participants’ behavior using a discrete attractor model, and calculated within-subject correlation between parietal delay-period activity and estimated sources of memory errors (drift and diffusion). We found that an increase in parietal activity was associated with increases in both diffusion and drift. Importantly, both parameters explained more variance in parietal delay-period activity than estimates of precision from classic mixture models. These results provide neural evidence for attractor dynamics as well as a new explanation for the function of parietal delay-period activity in working memory.