

Supplementary Figure S1

Effects of MPTP on response magnitude and duration as quantified from go-cue aligned SDFs. Results from this analysis were closely similar to those in measures taken from movement-aligned SDFs (Fig. 4D-E; following the same conventions). Results from 3-way ANOVA (MPTP \times response type \times animal) are shown below. *A*: The reduction in response magnitude was more severe in decrease-type responses (** $p < 0.01$, Tukey's test). *B*: Response durations were prolonged following MPTP administration and that prolongation was more prominent for monophasic responses (** $p < 0.01$, Tukey's test).

Supplementary Figure S2

The increased prevalence of cue-locked responses following MPTP (i.e., Fig. 5D) was found in both increase- (*left*) and decrease-type response populations (*right*). Results from chi-square analysis are shown below figure panels (* $p < 0.05$, ** $p < 0.01$, adjusted residual analysis). Open circles: monkey G. Open triangles: monkey I

Supplementary Figure S3

Effects of MPTP on jitter-corrected response metrics (dispersion, magnitude and duration; i.e., Fig. 6A-C) were similar in cue-locked (panels *A-C*) and movement-locked (panels *D-F*) response subtypes. Results from 3-way ANOVA (MPTP \times response type \times animal) are shown below.