STIMULUS-DRIVEN COMPETITION IN A CHOLINERGIC MIDBRAIN NUCLEUS

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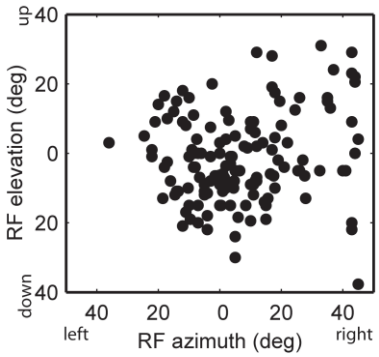
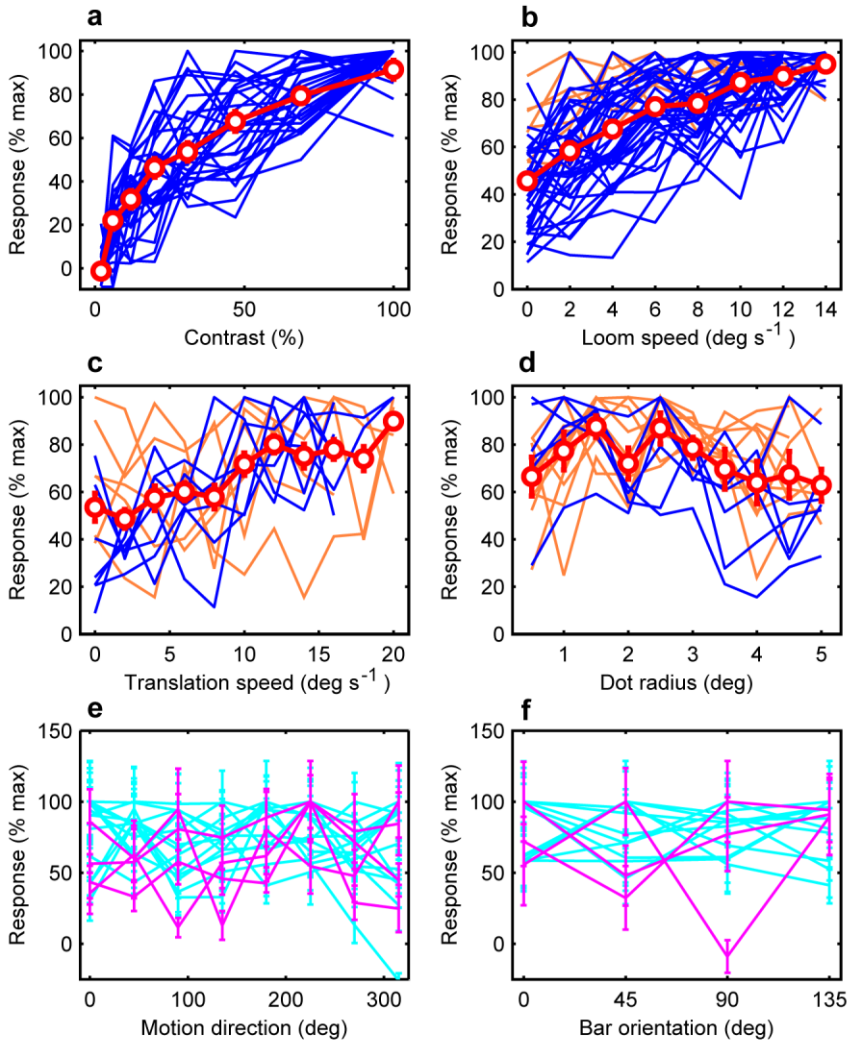
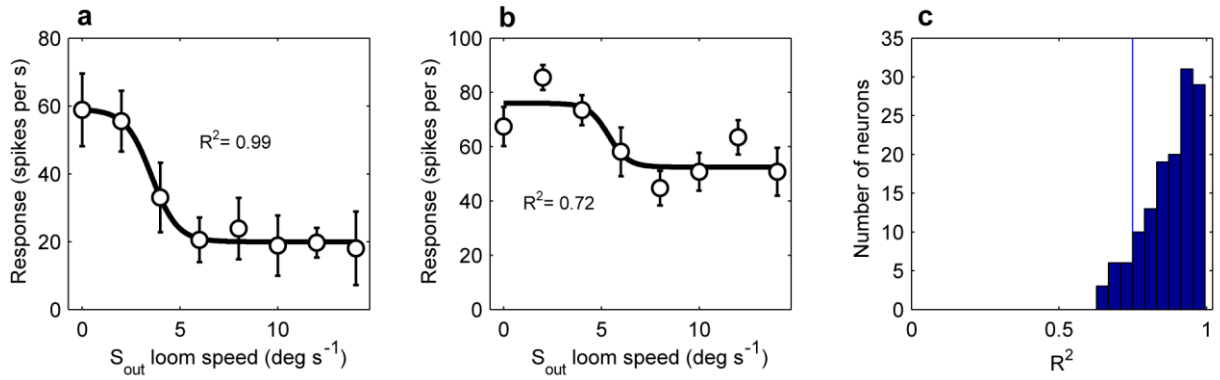


Supplementary Figure 1. Distribution of receptive field centers for the sampled population of lpc units tested with looming stimuli (n=147). RF centers ranged in azimuth from left 36º to right 45º and in elevation from -38º to +31º.

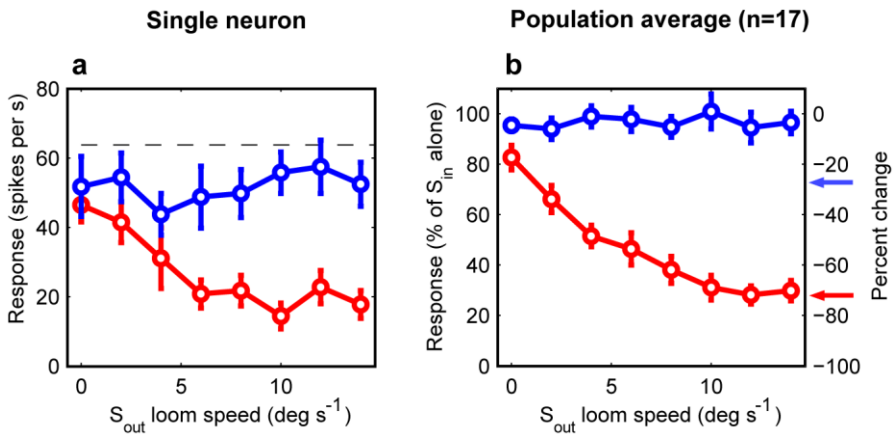


Supplementary Figure 2. Response functions of lpc units to different features presented alone at the center of the RF. a) Contrast of stationary dot, 1.5º radius. **b)** Loom speed of a full contrast dot. **c)** Translation speed, 1.5º dot, full contrast. **d)** Dot radius, full contrast. **e)** Motion direction, 1.5º radius dot, full contrast, 0º = straight up. **f)** Bar orientation, 4º length and 1º width bar, full contrast, 0º orientation refers to horizontal bar. Red circles in **a-d**: mean and s.e.m.; blue curves in **a-d**: response function for each unit exhibiting a significant response correlation with stimulus strength (correlation analysis, P<0.05); orange curves in **a-d**: response function for each unit with

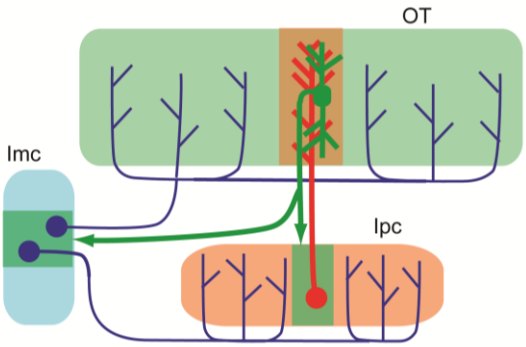
non-significant response correlation with stimulus strength (correlation analysis, P>0.05). Magenta curves in **e and f**: significant modulation (Kruskal-Wallis test, P<0.05); Cyan curves in **e** and **f**: non-significant modulation (Kruskal-Wallis test, P>0.05). Error bars indicate s.e.m.



Supplementary Figure 3. R-Squared assessments of goodness of sigmoidal fits to competitor strength-response profiles. a) Responses that were fit well (R^2=0.99). **b)** Responses that were fit poorly (R^2=0.72; not included in further analysis). **c)** Distribution of R^2 values for 135 neurons. Only responses for which fits exceeded the criterion of R^2 >0.75 (vertical line) were included in analyses. Error bars indicate s.e.m.



Supplementary Figure 4. Competitor strength-response profiles with the competitor in the same or opposite hemifiled as the S_{in} stimulus. All RF centers were located <15º azimuth. Red circles: S_{out} in the same hemifield as S_{in}; blue circles: S_{out} in the opposite hemifield as S_{in}. **a)** Data from a single unit. Horizontal dashed line: response to the S_{in} alone. **b)** Population averages (n=17). Units with S_{out} in the same hemifield (red curve) and opposite hemifield as the S_{in} stimulus. The arrows on the right side show the % changes of responses by S_{out} observed when they were measured with the global spatial interaction profile in Figure 4. Error bars indicate s.e.m.



Supplementary Figure 5. Schematic drawing of the isthmotectal circuit in birds. OT: optic tectum, Ipc: nucleus isthmi pars parvocellularis, Imc: nucleus isthmi pars magnocellularis. Based on data from reference15.

Supplementary Table 1: Combinations of features tested as S_{in} or S_{out} stimuli

S_{in} / S_{out}	Combinations Tested	Responses correlated with S_{out} strength correlation analysis, P<0.05	Responses suppressed equally by all S_{out} values Kruskal-Wallis, P<0.05	No effect of S_{out}
Total	190	174	3	13
Contrast/ Contrast	28	25	1	2
Loom/Loom	147	135	2	10
Move/Loom	2	2	0	0
Loom/Move	3	2	0	1
Move/Move	3	3	0	0
Loom/Auditory	7	7	0	0