

Figure S1. Labeled neurons projecting to the posterior thalamus. Related to Figure 2. A and B. Red dots indicate the p-thalamus-projecting neurons. SC: Superior colliculus, IC: Inferior colliculus, PPTg: Pedunculopontine tegmental nucleus, PAG: Periaqueductal gray, AC: Anterior commissure.



Figure S2, Fractal objects were used in value learning and memory tasks. Related to Figure 3. Total 216 visual objects were generated by fractal geometry and used for value learning and memory retrieval tasks.

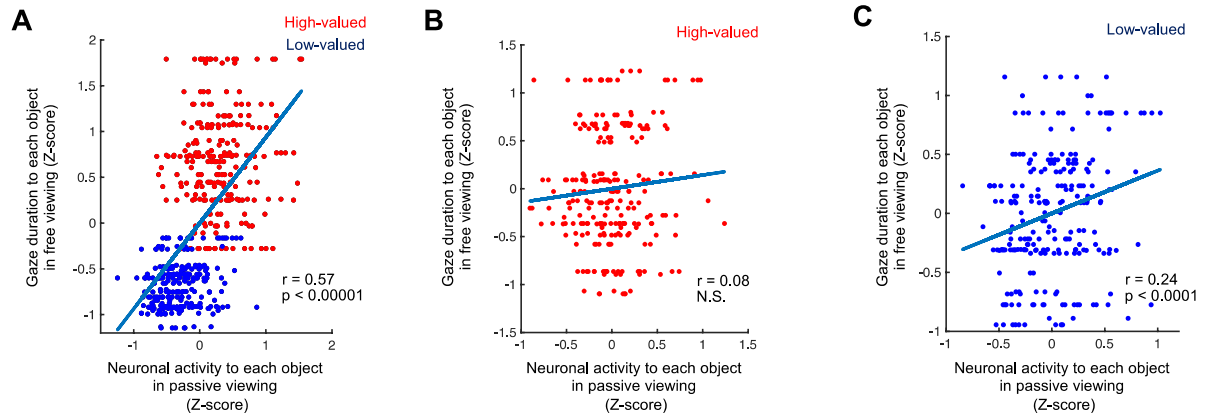


Figure S3. Correlations between the free viewing behavior and the SGN neuronal activity. Related to Figures 3 and 5. **A.** Normalized neural responses (Z-score) to high- and low-valued objects (abscissa) are positively correlated with the normalized gaze duration (Z-score) in free viewing (ordinate). Each dot indicates the response of one SGN neuron to one object in the passive viewing task (abscissa) and the monkey's gaze duration at the object in the free viewing task (ordinate). Number of objects: 32 (high-valued) and 32 (low-valued). Number of SGN neurons: 42 (monkey DW) and 27 (monkey PK). Red and blue dots indicate high- and low-valued objects, respectively. Blue line indicates the regression line. The r and p values were calculated by Pearson correlation coefficient. **B.** The same format as in (A), but only for high-valued objects. **C.** The same format as in (A), but only for low-valued objects.