SUPPLEMENTARY FIGURE LEGENDS

Supplementary Figure 1.

(*a*) Stimulus configuration for two visual memory tasks in different visual hemifields. Each split-brain monkey was trained to perform both a PA task and a visual discrimination (VD) task as a control task. During visual fixation, visual stimuli for the PA task were presented to one visual hemifield, whereas visual stimuli for the VD task were presented in the other hemifield. Using this configuration, split-brain monkeys performed the PA task with one hemisphere (PA hemisphere) and the VD task with the other hemisphere (VD hemisphere). (*b*) Intra-animal difference in mRNA expression levels for BDNF, *trk*B, and β-actin between the PA and VD hemispheres. In each cortical area of each monkey, the mRNA expression ratio was calculated by dividing the mRNA expression level of the PA (experimental) by that of the VD (control) hemisphere. The mRNA expression ratios were averaged across five animals and were plotted for the five cortical areas (mean ± s.e.m.). The BDNF mRNA expression level was significantly higher in A36 of the PA hemisphere than in the VD hemisphere. An asterisk indicates a significant difference between the PA and VD hemispheres ($P < 0.05$). (*c*-*i*) *In situ* hybridization of BDNF mRNA. (*c*-*f*) BDNF mRNA distribution in the inferior temporal gyrus of the PA hemisphere (*c*) and the VD hemisphere (*d*). BDNF mRNA accumulated in a patch in A36 of the PA hemisphere (framed area), but not in A36 of VD hemisphere. The framed areas in (*c*) and (*d*) are enlarged in (*e*) and (*f*), respectively. BDNF mRNA-positive cells were observed in layers V/VI and in layers II/III of the PA hemisphere. En, entorhinal cortex; 35, area 35; 36, area 36; TE, area TE; rs, rhinal sulcus; Arrowheads mark the boundaries between different cortical areas. (*g*-*i*) BDNF mRNA-positive cells in layers II/III of the PA hemisphere. The cell marked by the arrow

in (*e*) is enlarged and shown in darkfield (*g*), brightfield (*h*), and brightfield with epi-illumination (*i*). Silver grains were concentrated around lightly Nissl-stained neuronal nuclei. The cortical layers of A36 are indicated along the margin of (*f*). Scale bars, 1 mm (*c*, *d*), 250 μm (*e*, *f*), 50 μm (*g*-*i*).

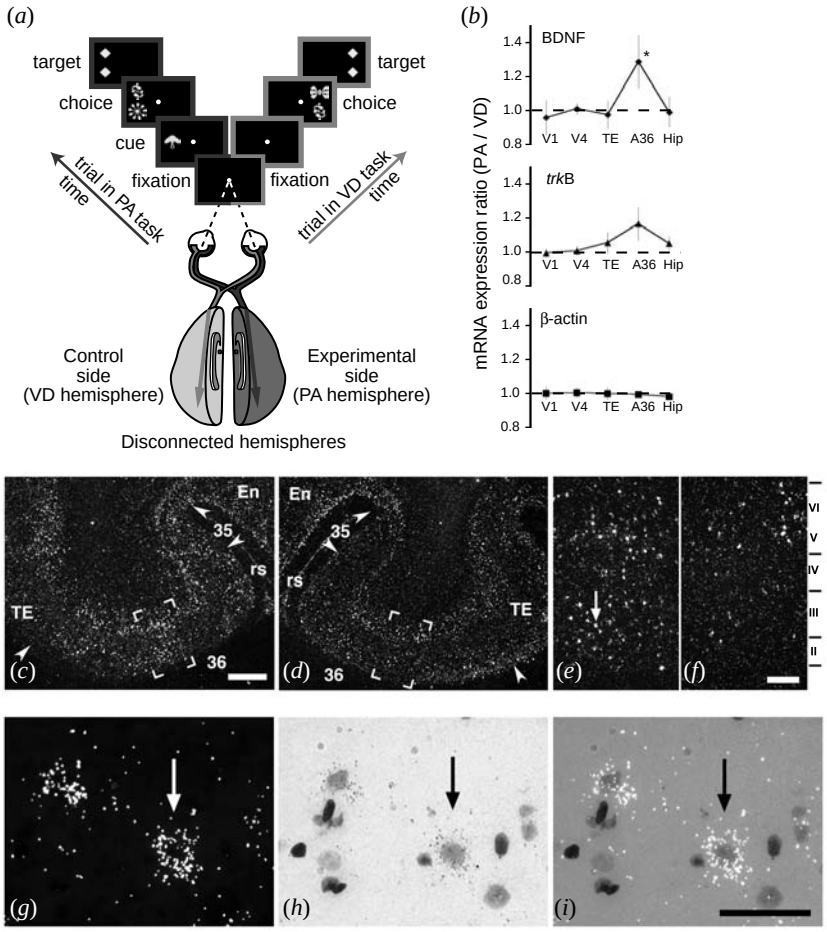
Adapted from Tokuyama *et al*. 2000.

Supplementary Figure 2.

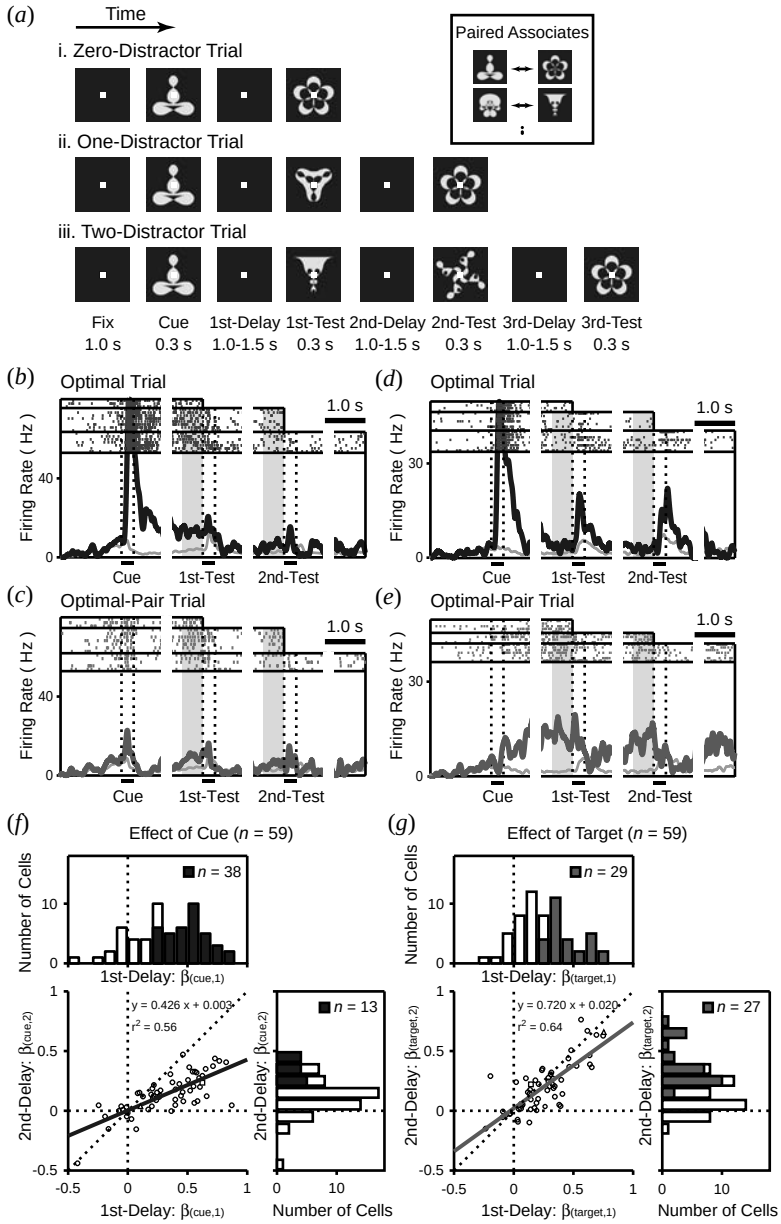
(*a*) Sequential-type PA task. After the fixation spot, one of the pictures was presented as a cue stimulus. During the delay period that followed the cue stimulus, one, two, or three test stimuli were presented (zero-distractor, one-distractor and two-distractor trial). The test stimulus was either the target stimulus, which was the paired associate of the cue stimulus, or a distractor stimulus. The inset shows examples of the stimulus pairs used. (*b*-*e*) Representative neurons with cue-holding (*b*, *c*) and target-recall (*d*, *e*) activity. Rastergrams and PSTHs of the optimal and optimal-pair trials are shown in black and gray, respectively. Thin gray lines indicate average PSTHs in trials in which the other 22 pictures were presented as cue stimuli. Data from correct trials were aligned to the onset of the cue, first test, and second test stimuli. Light-gray shadings indicate the first and second delay periods for analysis. (*f*) Effect of the cue stimulus on neural activity during the delay period. Neuronal discharges during the first and second delay periods were regressed by the discharges elicited by the cue, target, distractor and the paired associate of the distractor. The scatter plot shows the partial regression coefficient β values for the cue stimulus from the first delay (x-axis) to the second delay (y-axis) periods across the population of delay-selective neurons (n = 59). The regression slope was significantly positive (t = 8.58; P < 0.01). The histograms depict the distribution of $\beta_{(cue,\ 1)}$ (upper) and $\beta_{(cue,\ 2)}$ (right) values. Filled bars represent neurons with significantly positive values (P < 0.01). The number of neurons with significant β values declined from the first to the second delay period (38 to 13 neurons). (*g*) Effect of the target stimulus on neural activity during the delay period. The regression slope was significantly positive (t = 9.95; P < 0.01) and steeper than that of β values for the cue stimulus (F = 11.57; P < 0.01). The numbers of neurons with significantly positive β

values for the target stimulus were comparable in the first and second delay periods (29 to 27 neurons). The open triangle and square represent data from the neurons in (b), (c) and (*d*), (*e*), respectively. The vertical and horizontal dotted lines represent zero values. The orthogonal dotted line represents an equal effect of the cue stimulus (*f*) and the target stimulus (*g*) during the first and second delay periods.

Adapted from Takeda *et al*. 2005.



Supplementary Figure 1



Supplementary Figure 2