
Bilateral ablation of inferior temporal (IT) cortex in the macaque produces a severe impairment in visual pattern learning. The degree of impairment has been thought to be a function of the difficulty of the discrimination problem as measured by the performance of normal animals. However, in two previous studies (Cowey and Gross, Exp. Brain Res., 1970; Gross et al., J. Comp. Physiol. Psychol., 1971) monkeys with IT lesions were not impaired in learning to discriminate lateral mirror images, although normal monkeys found these discriminations relatively difficult. These paradoxical results suggest that lateral mirror images may be a special class of discriminanda for animals with IT lesions. To test this possibility, 6 monkeys with bilateral IT lesions and 6 control animals (with lateral striate or no lesions) were trained on a series of discriminations of mirror image and non-mirror image pairs. The animals with IT lesions showed the usual visual discrimination deficit on the non-mirror image tasks, but learned the mirror image tasks as quickly as the normal animals. The control animals, unlike the animals with IT lesions found the mirror image tasks much more difficult than the non-mirror image ones. IT cortex may be involved in the perceptual equivalence of lateral mirror image stimuli and perhaps in other perceptual equivalences.

EFFECTS OF TECTAL LESIONS ON PERIPHERAL FIELD VISION IN THE MONKEY. E. Gregory Keating. Veterans Administration Hospital and Depts. of Anatomy and Neurology, SUNY - Upstate, Syracuse, N.Y. 13210.

Current theory assumes the superior colliculus to be important for the control of 'ambient' or peripheral vision. Removing the tectum causes little visual deficit in primates perhaps because the lesioned monkey can shift to more foveal geniculo-striate pathways to solve most visual tests. In one experiment tectal lesions did impair accuracy in locating targets if the visual stimuli flashed too quickly for the monkey to shift all of them into its foveae (Keating, 1974). The present experiment measured the effects of tectal lesions on monkeys entirely prevented from using macular vision.

Five rhesus were trained on several tests including pattern and luminance discriminations and a third test which measured their accuracy in reaching for the dimmer of two lights flashing at various points in the visual field. Two monkeys also learned to distinguish a moving from a stationary shadow. The animals were retested after removal of the superior colliculus alone or in combination with a lesion of the central 60° - 40° of both retinas. Tectal lesions impaired accurate localization of briefly appearing stimuli but adding the retinal lesions did not greatly enhance the deficit. Combined tectal-retinal lesions (which sometimes included pretectum) did not impair pattern or luminance discriminations. Neither did the combined lesions cause the cortical blindness, visual agnosia, or movement discrimination deficits described by Anderson and Symmes (1969) to result from tectal-foveal striate ablation. Even adding foveal striate removal to the tectal-retinal lesions in two animals failed to enhance the effect of tectal lesion alone. (Supported by NS 10576.)