# INHIBITORY DIMENSIONAL AND INHIBITORY STIMULUS CONTROL IN PIGEONS WITH FOREBRAIN LESIONS

A thesis presented to the University of Auckland in partial fulfillment of the requirements for the degree of Doctor of Philosophy

by

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ACKNOWLEDGEMENT

The author wishes to express his gratitude to I.L. Beale, D. MacD. Webster and H.Sampson for supervision of this thesis.

C O N T E N T S

# A B S T R A C T

Lesions were placed in several areas of the telencephalon and diencephalon of the brain of the pigeon and the effects on the acquisition of inhibitory dimensional and inhibitory stimulus control were observed. The experimental tasks consisted of both visual and auditory interdimensional discriminations each of which had two components: In the first the stimuli were presented successively on the one response key (the main key) according to a multiple variable-interval extinction schedule. In the second the multiple schedule still obtained but a changeover key was added which, when pecked, changed the main-key stimulus, together with its associated schedule of reinforcement, to the next in a randomly ordered series. The use of these two components allowed the separation of two aspects of inhibitory control in learning: response reduction and stimulus reduction thereby permitting the assessment of discriminative ability in the absence of the confounding factor of response reduction.

Inhibitory dimensional and inhibitory stimulus control were assessed by post-discrimination generalization tests and combined-cue tests, respectively.

It was found that lesions to areas considered limbic - hippocampus, septum, anterior dorsomedial thalamus - had no effect on the learning of a visual discrimination. Lesions to the dorsolateral thalamus produced a complete inability to learn

this discrimination, presumably due to disruption of visual fibres en route to the telencephalon. Lesions to the Wulst produced a visual discrimination learning deficit in some birds but not in others, an inconsistency not accounted for by differences in lesion size. Wulst lesions also produced an auditory discrimination learning deficit and in this case the larger the lesion, the larger the deficit. Lesions to ectostriatum produced a deficit in the visual task and lesions to Field L, an auditory projection area, produced a deficit in the auditory task, but not in the visual task. However, in most cases the discrimination learning deficit which was produced was confined to the multiple schedule where the animal had no control over the presentation or duration of the stimuli. Once the changeover key was introduced most birds obtained the learning criterion very quickly by "switching out" of the negative stimulus. This effective changeover responding, together with unimpaired inhibitory dimensional or inhibitory stimulus control, suggested that although the initial learning deficit might be described in terms of an inability to withhold responding in the presence of stimuli previously correlated with reinforcement, this inability could not readily be explained in terms of a lesion-induced impairment in an inhibitory process.