EXPLORATION IN THE RAT AND THE MARMOSET: RELATIONSHIPS BETWEEN LEARNING AND OBJECT NOVELTY IN AN OPEN FIELD

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TABLE OF CONTENTS

SUMMARY

The research reported in this thesis is concerned with exploratory behaviour, and conditions under which exploration occurs or is enhanced. A series of experiments were conducted, using rats (*Rattus norvegicus*) and common marmosets (*Callithrix jacchus jacchus*) as subjects. Methodologically, the studies followed the 'ethoexperimental' approach to the study of animal behaviour, an approach which aims to study animals in the laboratory, but with reference to natural problems confronting them. A number of learning tasks and forms of reinforcement were employed, as well as variations in the open field itself, from an 'exploration box' to the animals' own home cages.

The initial study examined effects of response generalisation and extinction on exploration in the rat. Bar-pressing responses (using the paws) and key-pushing responses (using the nose) were conditioned in an open field, and exploratory behaviour was measured in the form of activities directed towards various novel objects. Two main predictions were made: firstly, that learning would lead to increased object exploration, and secondly, that animals trained to bar-press would subsequently explore more with their paws, whilst animals trained to key-push would explore more with their noses.

Two subsequent experiments viewed exploration in the context of the 'behaviour systems' approach; that is, in relation to systems of processes which serve particular survival functions (as opposed to arbitrary behaviours used to deal with arbitrary environments). Exploration directed towards familiar and novel objects was observed during conditioning and extinction in the presence of a moving ball bearing, the aim being to examine object-directed and ball bearing-directed activities in conjunction with the rats' appetitive behaviour system.

A discussion of comparative aspects of exploration was derived from a pair of studies using two different species: the open-field activities of the rat and the marmoset were compared under conditions of varying object novelty during both operant conditioning and extinction.

A final study examined effects of food reward, social reward and the mere presence of novel objects on marmosets' exploration in their home cages, thus providing a contrast to the previous studies, which all used an experimental testing field in an isolated room. The aim of the study was to obtain data relevant to cage design and maintenance of marmosets held in captivity.

The thesis concludes with a general discussion which provides a rationale for attempts to enrich the behaviour of animals held in laboratories and zoos, reviews some of the problems associated with captivity, and interprets the findings of the six experiments as possible solutions to these problems.