



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

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## TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	x
STATEMENT	xii
ACKNOWLEDGEMENTS	xiii
CHAPTER 1. DESCRIBING BEHAVIOUR	
1.1. Introduction	1
1.2. Experimental Psychology	1
1.3. Ethology	3
1.4. The Ethoexperimental Approach	6
1.4.1. Complementary nature of experimental psychology and ethology	6
1.4.2. A new paradigm: The ethoexperimental approach	8
1.4.3. Advantages of the ethoexperimental approach	10
1.5. Conclusion	12
CHAPTER 2. CONCEPTS OF EXPLORATION	
2.1. Introduction	14
2.2. The Problem of Definition	14
2.3. Attempts at Defining Exploration in the Psychological Literature	16
2.3.1. Extrinsic and intrinsic exploration	17
2.3.2. Inspective and inquisitive exploration	18
2.3.3. Specific and diversive exploration	19
2.3.4. Difficulties with Berlyne's definitions of exploration	19
2.4. The Adaptive Significance of Exploration	21
2.4.1. Costs of exploration	22
2.4.2. Acquisition of information about the environment	23
2.4.3. Maintenance of familiarity with the home range	24

	<u>Page</u>
CHAPTER 2 (continued)	
2.4.4. Location of new resources	24
2.4.5. Avoidance of predators	26
2.4.6. Learning new adaptive strategies	27
2.5. Contribution of Experimental Psychology to the Study of Exploration	29
2.5.1. Drive theories	30
2.5.2. Fear theories	33
2.6 An Ethoexperimental Interpretation of Laboratory Studies of Exploration	35
2.6.1. Escape	36
2.6.2. Reaction to predation and social separation	37
2.7. Conclusion	40
CHAPTER 3. THE OPEN FIELD AS A METHOD FOR STUDYING EXPLORATION	
3.1. Introduction	42
3.2. The Open Field	42
3.3. Independent Variables	43
3.3.1. Apparatus characteristics	43
3.3.2. Testing procedures	46
3.3.3. Experimental designs	48
3.4. Dependent Variables (Measures in the Open Field)	53
3.4.1. Ambulation or activity	54
3.4.2. Parameters other than whole body movement	57
3.4.3. Physiological techniques	62
3.5. Conclusion	63

	<u>Page</u>
CHAPTER 4. FACTORS AFFECTING OPEN-FIELD BEHAVIOUR	
4.1. Introduction	65
4.2. Subject Variables	66
4.2.1. Genetic variables	66
4.2.2. Experiential variables	72
4.2.3. Interactions amongst subject variables	85
4.3. Experimental Situation: Novelty, Complexity and Learning	87
4.3.1. Novelty	88
4.3.2. Habituation of novelty	93
4.3.3. Novelty may induce fear	96
4.3.4. Complexity	100
4.3.5. Preference for moderate levels of novelty and complexity	101
4.3.6. Novelty and complexity used for behavioural enrichment	103
4.3.7. Learning	106
4.4. Conclusion	114
CHAPTER 5. EXPLORATION AND EXTINCTION	
5.1. Introduction	115
5.2. Experiment 1: Effects of Response Generalisation and Extinction on Exploratory Behaviour in the Rat ( <i>Rattus norvegicus</i> )	118
5.3. Conclusion	138

	<u>Page</u>
CHAPTER 6. EXPLORATION IN THE CONTEXT OF THE BEHAVIOUR SYSTEMS APPROACH	
6.1. Introduction	140
6.2. The Behaviour Systems Approach	140
6.3. Experiment 2: Exploration in the Presence of a Rolling Ball Bearing	145
6.4. Experiment 3: Effects of Object Novelty on Exploration in the Presence of a Rolling Ball Bearing	164
6.5. Conclusion	179
CHAPTER 7. COMPARATIVE STUDIES	
7.1. Introduction	181
7.2. Experiment 4: Exploration in the Rat ( <i>Rattus norvegicus</i> ) During Conditioning and Extinction	183
7.3. The Marmoset as a Laboratory Animal	198
7.3.1. The marmoset's requirements in the laboratory	200
7.3.2. Observations of marmoset behaviour in captivity	202
7.4. Experiment 5: Exploration in the Common Marmoset ( <i>Callithrix jacchus jacchus</i> ) During Conditioning and Extinction	204
7.5. Conclusion	227
CHAPTER 8. HOME CAGE EXPLORATION	
8.1. Introduction	229
8.2. Experiment 6: Effects of Food Reward and Social Reward on Marmosets' Exploration in their Home Cages	230
8.3. Conclusion	258
CHAPTER 9. GENERAL DISCUSSION	260
APPENDICES	272
BIBLIOGRAPHY	290

## 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.