

THE INFLUENCE OF CEREBRAL LATERALISATION ON THE
BEHAVIOUR OF THE DOMESTIC DOG (*Canis familiaris*)

A thesis submitted for the Degree of

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by

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Declaration

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Abstract

Cerebral lateralisation was once thought to be unique to human beings, but has since been demonstrated in a number of non-human species. Lateralisation refers to the specialisation of each of the brain's hemispheres for the mediation of particular functions. Motor function is lateralised in many species, which is manifested by the preferential use of one limb over the other. It has been shown that increased usage of one hand or limb is associated with increased activity in the contralateral hemisphere. Limb usage can be compared with other variables in order to determine whether particular factors are associated with the left or right hemisphere of the brain.

The domestic dog (*Canis familiaris*) has featured in laterality research. The goal of the research reported in this thesis was to explore the ways in which brain lateralisation may influence dogs' abilities to perform particular roles. The first study investigated the relationships between the paw preferred by greyhounds on a task requiring them to obtain food rewards, and the behaviour exhibited on the greyhound racetrack. The findings from the study suggested that greyhounds exhibit preferences for the direction in which they exit the starting boxes at the beginning of each race and for the position in which they ultimately run on the racetrack. The results also suggest that increased usage of the left paw is associated with a greater frequency of running in the 'rail' position on the racetrack.

A second study investigated the relationships that exist between paw preference and various temperament traits in the dog. Two questionnaires were administered to dog

owners to obtain information relating to each dog's temperament, living conditions and its interactions. The findings indicated that there was a relationship between a left paw preference and stranger-directed aggression. The results also indicated that there were associations between various 'demographic' factors (e.g. frequency of exercise and attendance at training classes) and positive behavioural outcomes.

A third study investigated ocular laterality in a sample of competitive agility dogs to determine whether there were differences between the hemispheres' abilities to process visual information related to the perception of depth. Dogs negotiated a hurdle under the guidance of left monocular, right monocular, and binocular vision. The results indicated that limiting dogs to monocular vision influences several kinematics variables, including the dogs' limb preferences during the jumping behaviour, their velocity, angle of take-off, and total distance jumped. There were differences between the jumping kinematics variables when dogs were guided by left and right monocular vision. The findings indicate that the right hemisphere may be less proficient at processing visual information related to the perception of depth.

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Table of Contents

DECLARATION	I
ABSTRACT	II
ACKNOWLEDGEMENTS	IV
SECTION A: INTRODUCTION AND DEVELOPMENT OF METHODOLOGY	1
CHAPTER 1	1
LITERATURE REVIEW	1
1.1 OVERVIEW OF THESIS	1
1.2 THESIS STRUCTURE	7
1.2.1 <i>Flowchart of thesis structure</i>	11
1.3 INTRODUCTION	12
1.4 LATERALISATION	14
1.5 HISTORY	17
1.5.1 <i>Broca</i>	18
1.5.2 <i>Localisation</i>	19
1.6 THE TRANSITION FROM HUMAN TO ANIMAL EXPERIMENTATION	21
1.7 FUNCTIONS ASSOCIATED WITH THE HEMISPHERES.....	23
1.7.1 <i>Functions associated with the left hemisphere</i>	23
1.7.2 <i>Functions associated with the right hemisphere</i>	28
1.8 MOTOR LATERALITY.....	32
1.8.1 <i>Limb preferences</i>	32
1.8.2 <i>Limb preferences and the study of animals</i>	33
1.8.3 <i>Limb preferences in domestic animals</i>	35
1.8.4 <i>Associations between multiple measures of laterality</i>	41
1.9 SUMMARY.....	45
CHAPTER 2	47
GENERAL METHODOLOGY	47
2.1 INTRODUCTION.....	47
2.2 PREVIOUS METHODS FOR OBSERVING LATERALITY IN DOGS.....	47
2.3 KONG TESTING.....	55

2.3.1 'Kong'	56
2.3.2 Paw preference testing with the Kong.....	56
2.3.3 Number of trials and testing sessions.....	58
2.3.4 Scoring paw usage.....	59
2.4 STATISTICAL DETERMINATION OF PAW PREFERENCES	62
2.5 ALTERNATIVE TO KONG TESTING FOR GREYHOUNDS	62
SECTION B: EXPERIMENTAL CHAPTERS.....	65
CHAPTER 3	65
STUDY 1	65
THE RELATIONSHIP BETWEEN LATERALISATION AND RACETRACK BEHAVIOUR IN THE GREYHOUND.....	65
3.1 AIMS OF THE CURRENT STUDY.....	65
3.2 GREYHOUND RACING	65
3.2.1 <i>The Racetrack</i>	66
3.2.2 <i>Running position on the racetrack</i>	67
3.2.3 <i>Direction out of boxes</i>	67
3.2.4 <i>The relationship between running position on the racetrack and direction out of starting boxes</i>	68
3.3 LATERALISATION OF RACETRACK BEHAVIOUR.....	68
3.3.1 <i>Running position on the racetrack and direction out of boxes as forms of laterality</i>	68
3.3.2 <i>Relationship between racetrack behaviour and motor laterality</i>	70
3.4 THE PRESENT STUDY.....	70
3.5 IMPLICATIONS	72
3.6 METHODS	73
3.6.1 <i>Test subjects</i>	73
3.6.2 <i>Testing procedure</i>	73
3.6.3 <i>Testing location</i>	74
3.7 RACETRACK DATA	75
3.7.1 <i>SUREpick classifications of running line</i>	77
3.7.2 <i>SUREpick classifications of direction out of starting boxes</i>	77
3.8 RESULTS.....	77

3.8.1 Statistical analyses	77
3.8.2 Paw preference.....	78
3.8.3 Direction out of starting boxes.....	84
3.8.4 Running position on the racetrack	85
3.8.5 Association between paw preference and direction out of starting boxes	86
3.8.6 Association between paw preference and running position on the racetrack	86
3.8.7 Association between direction out of starting boxes and running position on the racetrack.....	88
3.8.8 Influence of training on racetrack behaviour.....	88
3.9 DISCUSSION	89
CHAPTER 4	99
STUDY 2	99
THE RELATIONSHIP BETWEEN LATERALISATION AND TEMPERAMENT	99
4.1 AIMS OF THE CURRENT STUDY.....	99
4.2 INTRODUCTION	99
4.3 TEMPERAMENT.....	100
4.3.1 Measuring Temperament with a Questionnaire	103
4.4 MOTOR LATERALITY AND TEMPERAMENT.....	106
4.5 QUESTIONNAIRES.....	114
4.5.1 Canine Behavioral Assessment and Research Questionnaire (C-BARQ).....	114
4.5.2 Canine Interaction and Home Environment Questionnaire (CIHEQ).....	116
4.6 METHODS	117
4.6.1 Subjects	117
4.6.2 Testing Procedure.....	117
4.6.3 Testing Location	118
4.6.4 Observing Paw Use	118
4.6.5 C-BARQ and CIHEQ Questionnaires	118
4.7 RESULTS.....	119
4.7.1 Statistical Analyses	119
4.7.2 Paw Preference.....	119
4.7.3 Lateralisation in the Sample of Dogs.....	119
4.7.3.1 Laterality Index	122

4.7.3.2 Effect of Sex and Age on Paw Preference	122
4.7.4 <i>Temperament Items</i>	125
4.7.4.1 Relationships Between C-BARQ Subscale Items and Paw Preference Group	125
4.7.4.2 Relationships Between C-BARQ Subscale Items and the Presence or Absence of Motor Laterality.....	127
4.7.4.3 Correlations Between Strength of Paw Preference and C-BARQ Subscale Items	130
4.7.4.4 Correlations Between ‘Demographic’ Variables and C-BARQ Subscale Items	130
4.7.4.5 CIHEQ Variables as Predictors of C-BARQ Subscale Items	133
4.8 DISCUSSION	135
CHAPTER 5	146
STUDY 3	146
THE INFLUENCE OF MONOCULAR AND BINOCULAR VISION ON JUMPING KINEMATICS IN THE DOG	146
5.1 AIMS OF THE CURRENT STUDY.....	146
5.2 OCULAR LATERALITY	147
5.3 STEREOSCOPIC VISION	149
5.4 THE HEAD CONFORMATION AND VISUAL SYSTEM OF THE DOG	151
5.5 LATERALISATION OF VISUO-SPATIAL ABILITIES	152
5.6 AGILITY COMPETITION.....	154
5.6.1 <i>Hurdles</i>	155
5.7 JUMPING KINEMATICS	156
5.8 PRESENT STUDY	158
5.9 METHODS	162
5.9.1 <i>Overview of Video Analysis</i>	162
5.9.2 <i>Subjects</i>	162
5.9.3 <i>Modified Head Collar</i>	163
5.9.4 <i>Single Bar Hurdle</i>	164
5.9.5 <i>Testing Grounds</i>	165
5.9.6 <i>Construction of the Jumping Chute</i>	165
5.9.7 <i>Video Point Markers</i>	168

5.9.8 Limb Preferences	172
5.9.9 Procedures.....	172
5.9.10 Video	175
5.10 RESULTS.....	176
5.10.1 Statistical Analyses	176
5.10.2 Jumping Kinematics Variables.....	176
5.10.2.1 Take-Off Point	178
5.10.2.2 Horizontal Velocity.....	178
5.10.2.3 Vertical Velocity	178
5.10.2.4 Resultant Velocity	180
5.10.2.5 Distance	180
5.10.2.6 Angle of Take-Off	183
5.10.2.7 Landing Point	183
5.10.3 Limb Preferences During the Jumping Stride	183
5.10.3.1 Leading Forelimb Preferences	184
5.10.3.2 Landing Forelimb Preferences	189
5.10.4 Relationship Between Paw Preference and Limb Preferences During Jumping Behaviour.....	192
5.10.5 Relationship Between Paw Preference and Jumping Kinematics Laterality Indices.....	192
5.11 DISCUSSION	193
5.12 CONCLUSION.....	208
SECTION C: DISCUSSION AND CONCLUDING REMARKS	211
CHAPTER 6	211
THESIS DISCUSSION: A SUMMARY OF THE FINDINGS, LIMITATIONS, AND SUGGESTIONS FOR FUTURE RESEARCH	211
6.1 RESTATEMENT OF THESIS BACKGROUND AND AIMS	211
6.2 MOTOR LATERALITY.....	212
6.2.1 Paw Preferences	212
6.2.2 Leading and Landing Limb Preferences	213
6.3 THE INFLUENCE OF BRAIN LATERALISATION ON ROLE-SPECIFIC BEHAVIOUR	215
6.3.1 Racetrack Behaviour.....	215

6.3.2 *Temperament in the Pet Dog* 217

6.3.3 *Ocular Laterality in the Agility Dog* 219

6.4 IMPLICATIONS OF THE RESULTS 220

6.5 LIMITATIONS 224

6.6 CONCLUDING REMARKS 228

REFERENCES **229**

Appendices

Appendix A: Canine Behavioral Assessment and Research Questionnaire (C-BARQ) 266

Appendix B: Scoring of Canine Behavioral Assessment and Research Questionnaire
(C-BARQ) 279

Appendix C: Canine Interaction and Home Environment Questionnaire (CIHEQ) 280

List of Tables

Table 4.1 <i>Summary of Study Hypotheses</i>	113
Table 4.2 <i>List of C-BARQ Behavioural Subscales and Number of Individual Questionnaire Items Comprising Each Subscale</i>	115
Table 4.4 <i>Difference Between C-BARQ Subscale Items for Lateralised and Ambilateral Dogs</i>	129
Table 4.5 <i>Correlation of C-BARQ Subscale Items and CIHEQ Variables</i>	132
Table 4.6 <i>Results of Hierarchical Multiple Regression Analysis for C-BARQ Items with CIHEQ Items as Independent Variables</i>	134
Table 5.1 <i>Randomised Order of Ocular Conditions Employed in the Study</i>	174
Table 5.2 <i>Difference Between Kinematics Variables for Monocular and Binocular Vision Conditions</i>	177

List of Figures

<i>Figure 1.1</i> Flowchart of thesis structure.....	11
<i>Figure 3.1</i> Number of greyhounds demonstrating lateralised and ambilateral paw use, based on z-score calculations.	79
<i>Figure 3.2</i> Number of greyhounds demonstrating left, right, and ambilateral paw use, as determined by z-score calculations.	80
<i>Figure 3.3</i> Distribution of Laterality Index (LI) scores in the sample of greyhounds.	82
<i>Figure 3.4</i> Absolute LI values in the sample of greyhounds.	83
<i>Figure 3.5</i> Scatter plot illustrating negative relationship between paw preference (LI) and frequency of running in the rail position.....	87
<i>Figure 4.1</i> Number of dogs demonstrating lateralised and ambilateral paw usage, as determined by z-score calculations.	120
<i>Figure 4.2</i> Number of dogs demonstrating left paw preference, ambilaterality, and right paw preference, as determined by z-score calculations.....	121
<i>Figure 4.3</i> Distribution of Laterality Index (LI) scores.	123
<i>Figure 4.4</i> Absolute LI values.	124
<i>Figure 4.5</i> Mean stranger directed aggression subscale scores for dogs demonstrating motor laterality and dogs demonstrating ambilaterality.....	128
<i>Figure 5.1</i> Diagram showing the distances of interest to the present study.	161
<i>Figure 5.2</i> Pictures of the three ocular conditions.....	164
<i>Figure 5.3</i> Diagram (not to scale) showing the layout and measurements of the experimental jumping chute.....	167

<i>Figure 5.4</i> Video Point screenshots demonstrating the digitisation of the relevant points.	170
<i>Figure 5.5</i> Diagram showing the relationship between the velocity variables and the angle of take-off.	171
<i>Figure 5.6</i> Bar chart depicting the horizontal velocity of dogs when under each of the ocular conditions.....	179
<i>Figure 5.7</i> Bar chart depicting the resultant velocity of dogs when under each of the ocular conditions.	181
<i>Figure 5.8</i> Bar chart depicting the total distance jumped by dogs when under each of the ocular conditions.....	182
<i>Figure 5.9</i> Distribution of leading limb preferences when dogs were guided by binocular vision.....	186
<i>Figure 5.10</i> Distribution of leading limb preferences when dogs were guided by right monocular vision.	187
<i>Figure 5.11</i> Distribution of leading limb preferences when dogs were guided by left monocular vision.	188
<i>Figure 5.12</i> Distribution of landing limb preferences when dogs were guided by binocular vision.....	190
<i>Figure 5.13</i> Distribution of landing limb preferences when dogs were guided by monocular vision.....	191