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 THERESIS STRUCTURE .............................................................................................. 7

1.2.1 Flowchart of thesis structure ............................................................................. 11

1.3 INTRODUCTION .......................................................................................................... 12

1.4 LATERALISATION ....................................................................................................... 14

1.5 HISTORY .................................................................................................................... 17

1.5.1 Broca ................................................................................................................ 18

1.5.2 Localisation ........................................................................................................ 19

1.6 THE TRANSITION FROM HUMAN TO ANIMAL EXPERIMENTATION ................... 21

1.7 FUNCTIONS ASSOCIATED WITH THE HEMISPHERES .......................................... 23

1.7.1 Functions associated with the left hemisphere .................................................. 23

1.7.2 Functions associated with the right hemisphere ............................................... 28

1.8 MOTOR LATERALITY .................................................................................................. 32

1.8.1 Limb preferences .............................................................................................. 32

1.8.2 Limb preferences and the study of animals ....................................................... 33

1.8.3 Limb preferences in domestic animals ............................................................... 35

1.8.4 Associations between multiple measures of laterality ...................................... 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
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 The Racetrack ................................................................................................... 66
    3.2.2 Running position on the racetrack ................................................................. 67
    3.2.3 Direction out of boxes .................................................................................. 67
    3.2.4 The relationship between running position on the racetrack and direction out of starting boxes ................................................................. 68
  3.3 LATERALISATION OF RACETRACK BEHAVIOUR .......................................................... 68
    3.3.1 Running position on the racetrack and direction out of boxes as forms of laterality ............................................................................................................. 68
    3.3.2 Relationship between racetrack behaviour and motor laterality ................. 70
  3.4 THE PRESENT STUDY ..................................................................................................... 70
  3.5 IMPLICATIONS ............................................................................................................. 72
  3.6 METHODS .................................................................................................................. 73
    3.6.1 Test subjects ..................................................................................................... 73
    3.6.2 Testing procedure .............................................................................................. 73
    3.6.3 Testing location ................................................................................................ 74
  3.7 RACETRACK DATA ........................................................................................................ 75
    3.7.1 SUREpick classifications of running line .......................................................... 77
    3.7.2 SUREpick classifications of direction out of starting boxes .............................. 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 Temperament Items .............................................................................................. 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 Hurdles ........................................................................................................... 155

5.7 JUMPING KINEMATICS ................................................................................................. 156

5.8 PRESENT STUDY ......................................................................................................... 158

5.9 METHODS ................................................................................................................ 162

5.9.1 Overview of Video Analysis ............................................................................. 162

5.9.2 Subjects .......................................................................................................... 162

5.9.3 Modified Head Collar ...................................................................................... 163

5.9.4 Single Bar Hurdle ............................................................................................ 164

5.9.5 Testing Grounds .............................................................................................. 165

5.9.6 Construction of the Jumping Chute ................................................................. 165

5.9.7 Video Point Markers ....................................................................................... 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 Summary of Study Hypotheses ................................................................. 113

Table 4.2 List of C-BARQ Behavioural Subscales and Number of Individual Questionnaire Items Comprising Each Subscale ................................................................. 115

Table 4.4 Difference Between C-BARQ Subscale Items for Lateralised and Ambilateral Dogs .................................................................................................................. 129

Table 4.5 Correlation of C-BARQ Subscale Items and CIHEQ Variables ...................... 132

Table 4.6 Results of Hierarchical Multiple Regression Analysis for C-BARQ Items with CIHEQ Items as Independent Variables ................................................................. 134

Table 5.1 Randomised Order of Ocular Conditions Employed in the Study................... 174

Table 5.2 Difference Between Kinematics Variables for Monocular and Binocular Vision Conditions ................................................................................................................... 177
List of Figures

Figure 1.1 Flowchart of thesis structure ................................................................. 11

Figure 3.1 Number of greyhounds demonstrating laterised and ambilateral paw use, based on z-score calculations. ................................................................. 79

Figure 3.2 Number of greyhounds demonstrating left, right, and ambilateral paw use, as determined by z-score calculations. .................................................. 80

Figure 3.3 Distribution of Laterality Index (LI) scores in the sample of greyhounds. .... 82

Figure 3.4 Absolute LI values in the sample of greyhounds. .................................... 83

Figure 3.5 Scatter plot illustrating negative relationship between paw preference (LI) and frequency of running in the rail position ..................................................... 87

Figure 4.1 Number of dogs demonstrating laterised and ambilateral paw usage, as determined by z-score calculations ................................................................. 120

Figure 4.2 Number of dogs demonstrating left paw preference, ambilaterality, and right paw preference, as determined by z-score calculations ......................... 121

Figure 4.3 Distribution of Laterality Index (LI) scores ............................................ 123

Figure 4.4 Absolute LI values ................................................................................ 124

Figure 4.5 Mean stranger directed aggression subscale scores for dogs demonstrating motor laterality and dogs demonstrating ambilaterality ............................... 128

Figure 5.1 Diagram showing the distances of interest to the present study ............... 161

Figure 5.2 Pictures of the three ocular conditions .................................................. 164

Figure 5.3 Diagram (not to scale) showing the layout and measurements of the experimental jumping chute ................................................................. 167
Figure 5.4 Video Point screenshots demonstrating the digitisation of the relevant points. ...................................................................................................................... 170

Figure 5.5 Diagram showing the relationship between the velocity variables and the angle of take-off. .............................................................................................................. 171

Figure 5.6 Bar chart depicting the horizontal velocity of dogs when under each of the ocular conditions........................................................................................................... 179

Figure 5.7 Bar chart depicting the resultant velocity of dogs when under each of the ocular conditions. ...................................................................................................... 181

Figure 5.8 Bar chart depicting the total distance jumped by dogs when under each of the ocular conditions...................................................................................................... 182

Figure 5.9 Distribution of leading limb preferences when dogs were guided by binocular vision...................................................................................................................... 186

Figure 5.10 Distribution of leading limb preferences when dogs were guided by right monocular vision........................................................................................................... 187

Figure 5.11 Distribution of leading limb preferences when dogs were guided by left monocular vision...................................................................................................................... 188

Figure 5.12 Distribution of landing limb preferences when dogs were guided by binocular vision...................................................................................................................... 190

Figure 5.13 Distribution of landing limb preferences when dogs were guided by monocular vision...................................................................................................................... 191