

# Contents

List of illustrations	xi
<b>1 Introduction</b>	<b>1</b>
Psychology and the theory of evolution	1
The mechanism of Darwinian evolution by natural selection	2
The nature of evolutionary adaptations	5
Why apples are sweet: ultimate and proximate explanations in psychology	7
Case study: The avoidance of incest	9
Summary	12
<b>2 Sexual reproduction</b>	<b>15</b>
The sexual imperative: sperm meets egg	15
The terminology of mating behaviour: systems and strategies	16
Patterns of human mating	18
<i>Contemporary traditional or pre-industrial societies</i>	19
<i>Hunter-gathering societies</i>	21
<i>Despots in early civilizations</i>	22
<i>The female perspective</i>	23
Summary	25

<b>3 Sexual selection</b>	<b>27</b>
Natural selection and sexual selection compared	27
Inter- and intrasexual selection	29
Parental investment	30
Potential reproduction rates: humans and other animals	31
The operational sex ratio	33
Consequences of sexual selection	36
<i>Sexual dimorphism in body size</i>	37
<i>Sexual enthusiasm</i>	39
<i>Post-copulatory intrasexual competition: sperm competition</i>	40
<i>Good genes and honest signals</i>	42
Summary	47
<b>4 Unravelling human sexuality</b>	<b>49</b>
Comparisons between humans and other primates	49
<i>Differences in body size between males and females</i>	49
<i>Testis size</i>	50
<i>Testis size and bodily dimorphism applied to humans</i>	51
Evolution and sexual desire: some expectations and approaches	56
<i>Cross-cultural comparisons using questionnaires</i>	57
<i>Surveys using published advertisements</i>	59
Facial attractiveness	62
Sexual jealousy	64
Summary	70
<b>5 Archetypes of the psyche: fears and anxieties as adaptive responses</b>	<b>73</b>
The universality of emotional life	73
Mental health and archetypes of the psyche	75
Fears, anxieties and phobias	76
Summary	81
<b>6 Evolutionary explanations of mental disorders</b>	<b>85</b>
Mental disorders: problems of terminology	85
Mental abnormalities: some hypotheses	88
<i>Malfunctioning mental modules</i>	88

<i>Exiles from Eden</i>	88
<i>The adaptive conservatism hypothesis</i>	94
<i>Preparedness theory</i>	95
<i>The normal distribution theory</i>	99
<i>Social homeostasis or rank theories of depression</i>	100
<i>Ontogenetic or developmental theories</i>	100
<i>Inclusive fitness theories</i>	102
A genetic basis for mental disorders	104
<i>Unipolar and bipolar depression</i>	105
<i>Schizophrenia</i>	105
The adaptive value of genetically based disorders	109
Evolutionary psychiatry: prospects	113
Summary	114
<b>7 The evolution of brain size</b>	<b>119</b>
The place of humans in nature	119
The importance of size	120
Brain size and the risks of childbirth	123
<i>Brain size and mating behaviour</i>	124
Brain size and scaling effects (allometry): a mathematical diversion	125
Ancestral brains	127
Summary	131
<b>8 The evolution of intelligence</b>	<b>133</b>
Origins of primate intelligence	133
<i>Environmental factors: foraging behaviour and private intelligence</i>	134
<i>Social factors: machiavellian intelligence and the theory of mind</i>	134
Food or sociality: testing the theories	136
<i>Methodological problems</i>	136
<i>Brain size and primate diet</i>	138
<i>Intelligence and the neocortex</i>	139
<i>Environmental and social complexity and neocortex volume</i>	140
<i>Problems with foraging and machiavellian theories</i>	142
Other theories of the evolution of intelligence	143

## CONTENTS

<i>Sexual selection and the evolution of the brain: the display hypothesis</i>	144
<i>Hardware–software co-evolution: the stimulus of language</i>	145
<i>Tool use</i>	146
Summary	150
<b>9 Study aids</b>	<b>153</b>
Improving your essay writing skills	153
<i>Practice essay 1</i>	155
<i>Practice essay 2</i>	159
<i>Practice essay 3</i>	162
Summary	164
Key Research Summaries	166
Glossary	169
Answers to progress exercises	175
Bibliography	185
Index	193

# Illustrations

## Figures

- |     |   |    |
|-----|---|----|
| 1.1 | A Darwinian wheel of life   | 4  |
| 1.2 | Photograph of Charles Darwin by Ernest Edwards, taken in about 1870   | 5  |
| 2.1 | Human mating systems in traditional cultures prior to Western influences                                      | 20 |
| 3.1 | Sexual selection as found in the hummingbird species <i>Sparthura underwoodi</i>                              | 29 |
| 3.2 | Intrasexual competition and the operational sex ratio   | 34 |
| 3.3 | Detail from <i>The Rake's Progress</i> by William Hogarth   | 36 |
| 3.4 | Sexual dimorphism in the beetle species <i>Chasognathus grantii</i>   | 38 |
| 4.1 | Body size dimorphism against mating system  | 50 |
| 4.2 | An adult male chimpanzee ( <i>Pan troglodytes</i> )   | 51 |
| 4.3 | Relative testis size against mating system  | 52 |
| 4.4 | Female's view of males illustrating relative size of body, penis and testes.                                  | 54 |
| 4.5 | Typical 'lonely hearts' advertisement   | 60 |
| 4.6 | Percentage of advertisers seeking and offering physical appearance and financial security according to gender | 61 |
| 4.7 | Percentage of advertisers in personal columns seeking resources   | 62 |

## ILLUSTRATIONS

4.8	Total number of divorces in England and Wales in 1995	67
4.9	Percentage of divorces in each age group according to sex and age group for England and Wales, 1995	68
4.10	Percentage of divorces as a result of adultery by sex in each age group	69
5.1	<i>The Scream</i> from a lithograph by Edvard Munch (1863–1944) made in 1895	78
5.2	<i>Anxiety</i> by Munch (1896)	81
6.1	A hypothetical normal distribution of the anxiety response	99
7.1	Traditional taxonomy of the human species	120
7.2	Time chart of some early hominids	121
7.3	Growth of brain size in relation to body size for mammals	126
7.4	Logarithmic plot of brain size against body size	127
7.5	Growth in human brain volume during human evolution	128
7.6	Evolutionary tree of selected primates	130
8.1	Triune model of the brain as proposed by MacLean	140
8.2	Plot of group size against neocortex ratio for various species of primates	141
8.3	Relationship between neocortical ratio and index of tactical deception for a variety of primates	142
8.4	Some possible evolutionary stimuli on the growth of hominid brains	149

## Tables

2.1	Simple classification of mating systems	17
2.2	Four basic mating systems	18
3.1	Mechanisms of intersexual competition	44
4.1	Physical characteristics of the great apes in relation to mating and reproduction	53
4.2	Predictions on mate choice preferences tested cross-culturally by Buss (1989)	58
4.3	Number of cultures supporting or otherwise hypotheses on gender differences in mate preference	59

4.4	Predicted differences in the experience of jealousy by men and women	65
5.1	Types of fear and their adaptive origins	79
6.1	Leading causes of world DALYs, 1990	94
6.2	Selection of results of an epidemiological study of phobias on a sample of 20,000 American subjects	98
6.3	Probability of developing schizophrenia	106
6.4	Approximate risk ratios for various disorders	108
7.1	Body weights, brain weights and encephalisation quotients for selected apes and hominids	129
8.1	Comparison of brain sizes of howler and spider monkeys	138