

2 EVOLUTIONARY APPROACHES TO THOUGHT AND BEHAVIOUR

Some of the questions addressed in this chapter

- What is the history of Darwinism in psychology and social science?
- What is 'instinct'?
- How can the past tell us about the present?
- How can the present tell us about the past?
- To what extent is evolutionary psychology a 'new science'?
- How do psychologists' and social scientists' use evolutionary ideas to explain thought and behaviour?

SOME KEY TERMS AND CONCEPTS

Adapted mind; Adaptive mind; Conceptual integration; Environment of evolutionary adaptation (EEA); Ethology; Human behavioural ecology; Instinct theory; Modularity; Sociobiology; Standard social science model.

LEARNING OBJECTIVES

Having studied this chapter you should be better able to:

- Detail what is meant by the term 'evolutionary psychology'.
- Outline the precursors to evolutionary psychology.
- Be able to distinguish between different ways of using evolutionary theory to explain human thought and behaviour.

INTRODUCTION

In the preface to this book it was said that the term 'evolutionary psychology' has a specific meaning and that it differs from other approaches which utilise Darwinian ideas to understand

and explain human thought and behaviour. And it was said that the title of this book glosses over these different approaches, choosing to use the term ‘evolutionary psychology’ because it has become the name of popular choice when referring to applications of evolutionary theory to mind and behaviour. In this chapter we will stop to pause and look more carefully at what evolutionary psychology proper purports to be. And we will look at how it is similar to and different from the line of thinking and research from which it has emerged and other contemporary approaches.

We will begin with an overview of what has been called the ‘instinct debate’ (Hampton, 2004b). The instinct debate refers to a protracted series of debates and discussions which took place amongst psychologists, social scientists and philosophers between c. 1890 and c. 1930. At its broadest, the discussion was about how to use and apply Darwin’s theory in psychology, sociology and anthropology. More narrowly it was a debate about how to properly define the term ‘instinct’. Instinct theory gave way to more experimentally orientated approaches in the 1930s. Most notable amongst them was behaviourism which was especially influential in America where the greatest concentration of academic psychologists was to be found.

We will then look at **ethology**. Ethology was initiated in Europe in the 1930s and it sought to examine and analyse the behaviour of organisms and species in situ, in their natural setting, in the wild. Whilst not specifically about humans, and situated outside of schools and departments of social science and psychology, as a discipline ethology was always relevant to human psychology. For example, Lorenz’s *On Aggression* (Lorenz, 1966) became and remains a staple point of reference for students of social psychology. And Bowlby’s series of books about human attachment (Bowlby, 1969) remains influential in developmental psychology.

As we saw in chapter 1, the work of William Hamilton is taken to have solved one of Darwin’s problems – altruism. His **kin selection** theory gave Darwinism a new impetus and two new strands of Darwinian psychology subsequently emerged. The first of them that we will consider is **sociobiology**, and the second is **human behavioural ecology**.

Our brief review of past and present varieties of Darwinian psychology will lead us to an explication of evolutionary psychology – arguably the most influential attempt to provide a Darwinian **paradigm** for psychology. The formulation of evolutionary psychology that we will focus upon is that presented by John Tooby and Leda Cosmides. Their essay ‘The psychological foundations of culture’ (1992) and the papers that presaged and preceded it, ‘Evolutionary psychology and the generation of culture, part I: theoretical considerations’ (1989), and ‘The past explains the present: emotional adaptations and the structure of ancestral environments’ (1990b), and subsequent iterations (see Tooby and Cosmides, 2005) “have informed virtually all work being conducted in the field of evolutionary psychology” (Buss, 2005:1), and Tooby and Cosmides are considered the ‘architects’ of evolutionary psychology (Pinker, 1997) and described as ‘true pioneers’ (Buss, 2005).

It is worth noting that the discussion in this chapter is largely uncritical of evolutionary approaches to thought and behaviour. The view has been taken that it is more useful, and less confusing, if concepts, theories and findings are laid out and understood before being subject to a critique. Or, to put the point another way, one can only sensibly and seriously criticise ideas after they have been fully explicated. We will be looking at empirical and conceptual difficulties in chapter 12 ‘Some problems with evolutionary approaches’. You are, of course, free to look at that chapter at any point of your choosing.

BOX 2.1 DARWIN AND DARWINISM

Apparently Karl Marx once said that he was not sure what Marxism was but he was sure that he wasn't a Marxist. What could he have meant? Presumably he saw some of the interpretations and variations of his theory of political and social change as being insufficiently true to his own position. Marx seemed to take some of the ways in which his name was applied to ideas to be illegitimate uses of what might think of as his 'brand'. The same situation is probably true for other famous theorists and thinkers – Freud for example. Is it true of Darwin? Is today what we call 'Darwinism' and the 'Darwinists' who trade on the Darwin 'brand' true to Darwin?

THE INSTINCT DEBATE

The idea that humans come into being equipped with certain sorts of knowledge, with certain proclivities and abilities which subsequently mature and can be seen in the child and adult, has been an issue in psychological and behavioural thought since Aristotle, and the notion of 'instinct' is of equal vintage (Beach, 1955; Drever, 1917; Hobhouse, 1901; Richards, 1987; Robinson, 1981; Wilm, 1925). If we were to accept the orthodox view and accept that psychology proper emerged as a distinct academic specialty in the late nineteenth century (see Farr, 1985), it would be reasonable to say that at that time the concept of instinct was as salient and considered as important as any other idea in the discipline. Many researchers and theorists who today historians of psychology take as representative of academic psychology in its infancy contributed to what we can call 'the instinct debate' (e.g. Allport, 1924; Angell, 1906, 1907; Dewey, 1896, 1930; Dunlap, 1919, 1922, 1932; James, 1890; Lloyd-Morgan, 1894; McDougall, 1908; Mead, 1936; Thorndike, 1911; Titchener, 1914; Tolman, 1922, 1923, 1932; Watson, 1913, 1919, 1931; Yerkes, 1911 – see Hampton, 2004b). This debate was inspired by Darwin's theory, given impetus by William James in his influential *Principles of Psychology* (James, 1890), and, more widely popularised by William McDougall courtesy of his textbook *An Introduction to Social Psychology* (McDougall, 1908). Darwin discussed instinct in *The Origin of Species*, and again in *The Descent of Man* and *The Expression of Emotion in Man and Animals*. Although he stated 'I will not attempt a definition of instinct', he did, in effect, produce a guarded definition by writing:

An action, which we ourselves require experience to enable us to perform, when performed by an animal, especially by a very young one, without experience, and when performed by many individuals in the same way, without their knowing for what purpose it is performed, is usually said to be instinctive. (Darwin, 1859: 191)

Furthermore, Darwin clearly took instincts to be a phenomenon suitable for psychological inquiry by adding, 'It would be easy to show that several distinct mental actions are commonly embraced by this term' (ibid.: 191).

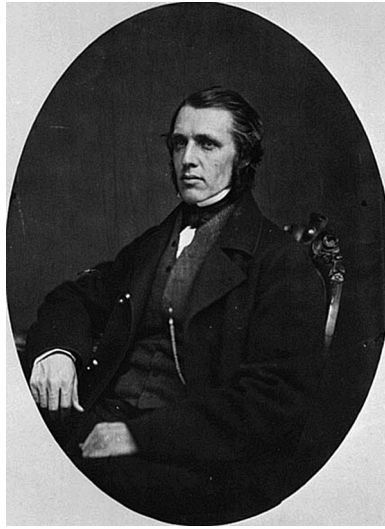


Figure 2.1 William McDougall

Perhaps Darwin did not say enough. He certainly left open much room for further discussion and elaboration. The attempt to define instinct – to say exactly what counted as an instinct, to specify what it was that constituted an instinctive act or thought – fractured into a series of oppositions, schools and, in the end, antagonisms (Hampton, 2006). Anglo-Saxon psychologists eventually lost patience with what seemed to be a slide back into the methods and prospects that the discipline faced when it was still a branch of philosophy of mind (Richards, 1987).

For our purposes we need to note that the attempt to establish the concept of psychological instincts was explicitly Darwinian. That is, the scholars mentioned above and many others took themselves to be Darwinians and to be working on and working out Darwin's suggestion that his theory would become the foundation stone for psychology (Hampton, 2004b). Furthermore, instinct theory was psychological in that instincts were supposed to be a property of our minds – conscious or unconscious, in concert with or in opposition to intelligence – that governed our thought, motivations and social behaviour. Among the instinct theorists who classed themselves as psychologists few were of greater importance than William MacDougall (Hampton, 2005a). This is how MacDougall defined instinct: 'The human mind has certain innate or inherited tendencies which are the essential springs or motive powers of all thought and action ... These primary innate tendencies ... are probably common to the men of every race and every age' (McDougall, 1908, p. 19). And:

We may, then, define an instinct as an inherited or innate psycho-physical disposition which determines its possessor to perceive, and to pay attention to, objects of a certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in regard to it in a particular manner, or, at least, to experience an impulse to such action. (Ibid.: 29)

In due course we will see that the contemporary approach which calls itself evolutionary psychology is really quite similar to McDougall's formulation.

BOX 2.2 OBJECTIONS TO EVOLUTIONARY PSYCHOLOGY: EUGENICS

When the term 'eugenics' was coined in the latter part of the nineteenth century it meant 'well born', and it was used to refer to persons of 'good stock', and it connoted 'health'. When the term was politicised it came to represent the view that evolutionary theory could be used to determine and control on who could and should reproduce (Galton, 1979; Jones, 1998). There are two very good reasons why we might object to eugenics, and, in the process object to the theory which gives it its licence.

Nazism took eugenics to be the study and practice of improving the human race by controlled selective breeding. And we know the outcome – the Holocaust and the many other terrible abuses committed by the Third Reich. Carlos Blacker, the General Secretary of the Eugenics Society between 1931 and 1952, argued that the crimes of the Nazis would come to be seen as the most important event in the history of eugenics. Blacker thought that objections to the historical events would lead to objections to the ideas that brought them about (Blacker, 1952).

Eugenics also invites a further and even more profound objection to evolutionary theory. The very idea that there is such a thing as 'well bred' person of 'good stock' is abhorrent to some. Mere utterance of such terms implies a deep-rooted, unalterable inequality between those who exhibit properties deemed good and those who do not. Accordingly, we might argue that the truth or falsity of the notion of biological fitness is irrelevant, and that we must ignore evolutionary theory and organise ourselves on the assumption that we are all born the same. On this view eugenics provides us with grounds to reject evolutionary approaches to thought and behaviour because they violate the belief in offering the same opportunities and striving for equality of outcome for all.

ETHOLOGY

Whereas the notion of instinct fell out of favour in America and The United Kingdom in the 1930s it found a home amongst naturalists and zoologists in Europe in the same decade. Whereas psychology at that time used animals to cast light on human psychology, ethology was much more specifically the study of animal behaviour in general with an interest in humans only in so far as it took us to be just another type of animal. Just as Darwin had hinted that instincts were unlearned whilst habits were acquired, ethology was interested in unlearned and inherited behaviour rather than learned and habitual behaviour.

Konrad Lorenz, Karl von Frisch and Nikolaas Tinbergen are generally recognized as the founders of ethology, a recognition cemented by their receipt of the Nobel Prize in 1973. Desmond Morris, Irenäus Eibl-Eibesfeldt, Robert Hind and Patrick Bateson have also been influential in the field and are better known for their application of the principles of ethology to human behaviour. Desmond Morris's volume *The Naked Ape* (Morris, 1967) may be taken to mark the point at which an ethological approach to human thought and behaviour became of interest to the wider reading public and it is still in print today.

BOX 2.3 SEX AND THE SAVANNAH: THE NAKED APE GOES BANANAS

The BBC claimed that the world was 'stunned' when Desmond Morris published *The Naked Ape* which went about describing humans in the same manner as did zoologists when discussing any other animal. The content of the book did not disappoint those who found the title provocative.

Whilst not wholly concerned with sex many reviewers chose to emphasise some of Morris' claims about human reproduction. For example, amongst all the claims the book makes, some which became more well known and talked about include:

- We have the largest penis and the largest breasts as well as the largest brains in the primate world
- Penises and breasts have been shaped by sexual selection to act as a signal to prospective mates.
- We are the most sex obsessed amongst the primates.
- Our unique ear-lobes are erogenous zones that can be the source of orgasms in both sexes.

The book was a marked success. It was serialised by a British tabloid newspaper and became a bestseller in Europe and America. So successful was *The Naked Ape* that Morris became a tax exile. The book is still in print today. In less than a decade another bestselling book about the biological basis of human behaviour would 'stun' the world – Richard Dawkins' *The Selfish Gene*.

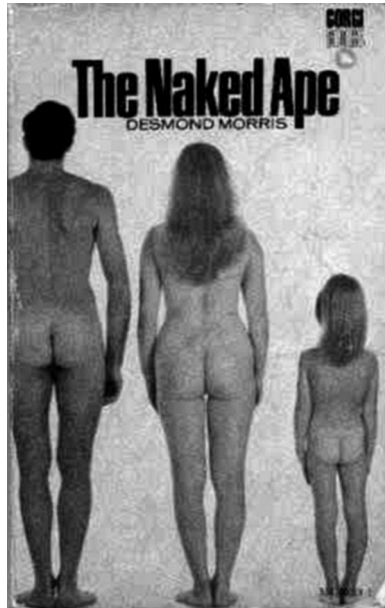


Figure 2.2 *The Naked Ape* first published in 1967

Ethology has a legacy in psychology. Common in the introductory textbooks with which most psychology students are familiar with is a treatment of Lorenz's notions of 'fixed action

patterns, 'innate releasing mechanisms' and 'imprinting' (Lorenz, 1981). **Fixed action pattern** refers to a functional sequence of behaviours which is typical of a species and is triggered by a specific stimulus – the **releasing mechanism**. **Imprinting** refers to phase-sensitive learning wherein a certain sort of event needs to take place during what is known as a 'critical period'. These concepts are still used in ethology today and they have been applied in human developmental psychology. For example, when we talk of the first hours after birth as being a critical period during which mother and child 'bond' we are supposing that mother and child act as a stimuli to one another which triggers a pattern of thought and behaviour which can be conceived of as attachment behaviour (Bowlby, 1969). As with the term 'instinct', evolutionary psychologists do not readily appeal to the terms 'fixed action patterns', 'innate releasing mechanisms' and 'imprinting' but it does appeal to the underlying concepts. Contemporary evolutionary psychology subscribes to the idea that we have innate behavioural repertoires, that they are triggered by internal and external stimuli, and that the appearance of these behaviours is contingent on environmental conditions (Tooby and Cosmides, 1992).

Perhaps the most useful theoretical tool in ethology came from Tinbergen and his contention that we should ask four sorts of question when analysing the behaviour of organisms from an evolutionary point of view (Tinbergen, 1963). In no particular order, Tinbergen suggests that we should ask:

- 1 What is the function of a given typical or common behaviour? How does it relate to and solve the (more or less) immediate problems of survival and reproduction?
- 2 What is the cause of the behaviour? Which stimuli trigger the behaviour or what are the precedents of it?
- 3 What is the ontogeny of the behaviour? How does it come to develop in the individual during its life course?
- 4 What is the phylogeny of the behaviour? How has it come to be selected for and evolve in the species?

The utility of the distinctions are various. First, they can help us to locate and refine questions. Second, they can help us to decide what sort of evidence would address which sort of question. Third, distinctions between types of 'why?' question can help us to make sense of existing evidence. And fourth, they can help us to expand and elaborate our questions. For example, suppose that we were interested in the phenomenon wherein children typically come to be orientated towards their peer group as the most explicitly and consciously salient and influential persons in their environment at about the age of 10 (Harris, 1998; Maccoby, 1998). Tinbergen's four whys suggest that a rounded evolutionary account needs to show if and how the shift in orientation impacts upon the long-term fitness of the child, what happens so that we might reasonably say what is a cause or necessary condition for the change, how the change comes about over the life course of the child and how an orientation towards peers evolved so to become species typical of human children.

Evolutionary psychology has adopted Tinbergen's scheme, but it has recast it into a distinction between ultimate and proximate mechanisms. The former entails a focus on the functional history of the psychological adaptations that organise our behaviours in the here and now. The latter entails a description of how the adaptations work in real time.

SOCIOBIOLOGY

Whilst first use of the term ‘sociobiology’ appears to have been in a volume published in 1949 called *Principles of Animal Ecology* (Alled et al., 1949), its fame (and, for some, notoriety) came with the publication of E.O. Wilson’s *Sociobiology: The New Synthesis* in 1975 and Richard Dawkins’ *The Selfish Gene* which followed in 1976. Widely cited within academia and beyond, these two books mark the beginning of sociobiology as a school of thought and a research programme with a definite identity.

As the term implies, sociobiology analyses the social behaviour of species from a biological, and, more precisely, from a gene’s-eye, point of view. Like ethology, sociobiology isn’t exclusively or especially interested in humans. Wilson demonstrated this by devoting just one chapter of 27 to humans. In essence sociobiology is a working out of Hamilton’s insights and solution to the problem of altruism, and Roberts Triver’s theories of **reciprocal altruism** and **parental investment** (Trivers, 1985).

Evolutionary psychology and sociobiology are seen by some being of as piece, and it has been suggested that the former is merely a re-branding of the latter (Rose, 2000; Rose and Rose, 2000). However, leading proponents of evolutionary psychology claim that there is a critical difference between the two approaches. The claim is that sociobiology adheres to the assumption that organisms work toward the maximisation of their inclusive fitness – they are ‘fitness maximizers’ motivated by the grand objective of maximum reproductive success and ought to be analysed as such. In contrast evolutionary psychology adheres to the assumption that our thought and behaviour is determined by short-term goals which, if achieved, add up to reproductive success (Buss, 1995; Tooby and Cosmides, 1992). We will explore this supposed difference and work out some of the implications in due course, and most especially in Chapter 10 ‘Evolution and Abnormal Psychology’.

Few theories of human behaviour have evoked as much controversy as sociobiology. Whilst it has attracted thoughtful and valuable critiques such as Philip Kitchers’ *Vaulting Ambition* (1985), it has also attracted a hostility that does not really address the quality of the theory and its explanation of evidence (Wilson, 1994). It has been argued that whilst evolutionary theory had developed enough to be extended to an analysis of the social behaviour of humans, psychology and the social sciences had not (Pinker, 2002).

HUMAN BEHAVIOURAL ECOLOGY

Human behavioural ecology (sometimes abbreviated as HBE) applies evolutionary theory to the study of human behaviour in its natural or spontaneous contexts and is a branch of anthropology. Like ethology, HBE is interested in behaviour *in situ*. It typically works on the assumption that humans are adaptive in that our behaviour is organised around a wider unconscious strategy to optimise our inclusive fitness (Laland and Brown, 2002). The different strategies adopted and developed in differing ecological and social environments to the end of maximal inclusive fitness give rise to individual, group-level and cultural

diversity. HBE looks to establish the adaptive advantages of individual, group and cultural traits, rituals and means of solving problems. It also adopts a life-history approach to see how behaviours change in light of the differing adaptive problems that come and go during the course of an individual life. In other words, 'The principal goal of human behavioural ecology is to account for the variation in human behaviour by asking whether models of optimality and fitness-maximization provide good explanations for the differences found between individuals' (Laland and Brown, 2002: 112).

Importantly, for HBE 'An overriding assumption is that human beings exhibit an extraordinary flexibility of behaviour, allowing them to behave in an adaptive manner in all kinds of environments' (Laland and Brown, 2002: 112). This assumption and the emphasis on flexible means towards the end of Darwinian fitness has led to HBE being called the 'adaptive mind' approach (Hampton, 2004a). As we will see, this is to be contrasted with evolutionary psychology which emphasises the adapted nature of the human mind.

Behavioural ecologists accommodate differences in the expressed behaviour of persons in a group and between different groups courtesy of **life history theory**. Life history theory is based on the assumption that the life of any organism, including a human, involves a trade off between what is called somatic effort and reproductive effort and that effort devoted to the former cannot be devoted to the latter, and vice versa. Somatic effort refers to all time and energy expended in the development and maintenance of the body – i.e. to survival. Reproductive effort refers to all time and energy devoted to mating, parenting and inclusive fitness. It is supposed that life is a trade off between the two classes of expenditure and effort and the trade-off is shaped by age, sex, local mortality rates, mate value, sex ratio, resource base and ecological constraints. The flexing and alterations of behaviour according to local conditions in order to come to the best trade-off between somatic and reproductive effort, and to adopt the best somatic and reproductive strategy amounts to the particular life history of the organism. Human behavioural ecologists work on the premise that one might predict the life history of a given organism or group if one assumes that the organism will work towards optimal inclusive fitness in the circumstances it finds itself (Kaplan and Gangestad, 2005).

EVOLUTIONARY PSYCHOLOGY

Evolutionary psychology is sometimes referred to as the 'adapted mind' approach (Hampton, 2004a). The reason for this is straightforward. The volume which cemented together thinking and research into what we might call a school or new movement is called *The Adapted Mind: Evolutionary Psychology and the Generation of Culture* (Barkow et al., 1992), and it may be regarded as 'one of the first and most important collections of essays on modern evolutionary psychology' (Badcock, 2000: 17). It is regarded as 'first' because it claims to introduce a novel approach. And its importance flows from its ascription as being 'the seminal publication in th[e] field' (Corballis and Lea, 1999b: v).

Evolutionary psychology is grounded in the evidence-based conviction that human beings are an evolved species just like any other. It shares this conviction with the instinct theorists of the early twentieth century, with the ethologists in the mid-part of the century,

sociobiologists in the 1970s and 1980s, and human behavioural ecologists today. Like instinct theory, evolutionary psychology is centred on the supposition that evolved psychological dispositions generate human behaviour and culture. Like ethology it is amenable to comparative evidence from other species. Like sociobiology it seeks to establish evolutionary theory as the pre-eminent guiding orientation in psychology and the social sciences. And like human behavioural ecology it takes the view that traditional, non-industrialised societies may be of especial importance to our understanding of our evolved traits. According to Barkow et al., evolutionary psychology

... unites modern evolutionary biology with the cognitive revolution in a way that has the potential to draw together all of the disparate branches of psychology into a single organised system of knowledge ... [our goal] is to clarify how this new field, by focusing on the evolved information-processing mechanisms that comprise the human mind, supplies the necessary connection between evolutionary biology and the complex, irreducible social and cultural phenomena studied by anthropologists, sociologists, economists, and historians. (Barkow, Cosmides and Tooby, 1992: 3)

Of the 19 papers that comprise *The Adapted Mind*, four are wholly theoretical. Of the theoretical papers, Tooby and Cosmides' 'The psychological foundations of culture' is the cornerstone and it has been the most influential. For example, in Pinker's view 'John Tooby and Leda Cosmides ... forged the synthesis between evolution and psychology' (1997: x). Tooby and Cosmides make four main claims in their essay which, together, constitute their argument for an evolutionary approach to psychology and society.

In order of original presentation, the four claims are that psychology and the social sciences should be conceptually integrated with biology and the natural sciences, that psychology and the social sciences have been dominated by what they call the 'standard social science model', that to understand the present condition of humans and their psychology we must appeal to our natural history, and that humans minds are comprised of psychological adaptations which can be thought of as discrete information-processing machines. Let us unpack and examine each of these claims in a little more detail and look at the role each plays in evolutionary psychology.

BOX 2.4 BACKWARDS AND FORWARDS: THE ADAPTED MIND AND THE ADAPTIVE MIND: TRY IT THIS WAY ...

A distinction between two contemporary approaches which use evolutionary theory to understand and explain psychology and behaviour can be thought about by looking at human behavioural ecology as a 'backward' approach and evolutionary psychology as a 'forward' approach (Reeve and Sherman, 2007; Sherman and Reeve, 1997).

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Evolutionary psychology – the forward approach:

- 1 Describe the features of the past (the proper domain).
- 2 Using our knowledge of the past, stipulate the likely fitness utility of a proposed pattern of thought or behaviour 'X' in the past.
- 3 Establish the frequency of 'X' in the present (the actual domain).
- 4 If 'X' would have had fitness utility in the past and is typical in the present then we can conclude that 'X' has been selected for.

In other words, the forward approach says that we should evaluate the present in terms of the past – the past explains the present.

Human behavioural ecology – the backward approach:

- 1 Describe the features of the present (the actual domain).
- 2 Evaluate the fitness utility of a given pattern of thought or behaviour 'X' in the present.
- 3 Postulate the likely fitness utility of 'X' against a model of the past (the proper domain).
- 4 If 'X' has a fitness utility in the present and it would have had a fitness utility in the past then we can conclude that 'X' has been selected for.

In other words, the backward approach says that we should evaluate the past in terms of the present – the present explains the past.

CONCEPTUAL INTEGRATION

Conceptual integration as a claim belongs to the philosophy of science. It is a particular view on the way in which we should acquire an understanding of our thought, behaviour and societies. According to Cosmides et al., conceptual integration,

... refers to the principle that the various disciplines within the behavioural and social sciences should make themselves mutually consistent, and consistent with what is known in the natural sciences as well ... A conceptually integrated theory is one framed so that it is compatible with data and theory from other relevant fields. (1992: 4)

And, according to Cosmides et al., 'As a result' of the failure of social scientists to adhere to the principal of conceptual integration, 'one finds evolutionary biologists positing cognitive processes that could not possibly solve the adaptive problem under consideration, psychologists proposing psychological mechanisms that could never have evolved, and anthropologists making implicit assumptions about the human mind that are known to be false' (ibid.: 4).

Barkow et al., liken conceptual integration to 'vertical integration'. Vertical integration amounts to a philosophy of knowledge that is reductionist in the most commonly understood sense wherein physics is privileged as a source of knowledge (Chalmers, 1999). In this

scheme integration is necessitated by causation, and causes flow vertically upwards from more precise levels of analysis. Every scientific claim is explicable and consistent with what is known in the science immediately below it in a hierarchy. The hierarchy is determined by the precision of physical detail and prediction. Thus ‘the laws of physics apply to chemical phenomena, and the principles of physics and chemistry apply to biological phenomena, but not the reverse’ (Cosmides et al., 1992: 4).

Conceptual integration amounts to a slight softening of the position inherent in vertical integration. Sciences as a whole are a family of bodies of knowledge that form a cluster rather than an ‘epistemological or status hierarchy’ (ibid.: fn. 13). The criterion of mutual consistency remains but the difference between the hierarchy of vertical integration and the ‘heterarchical relationships’ (ibid.: fn. 14) encouraged by conceptual integration comes with the reciprocal influence between sciences that the conceptual integration permits. So, whilst the causal chain that evolutionary psychology proposes is: natural selection > evolution > adaptations > psychological mechanisms > culture, and, it follows, there is no suggestion that culture is responsible for psychological mechanisms in the manner that psychological mechanisms are responsible for culture, the demand that culture be consistent with psychological mechanisms is matched by the demand that psychological mechanisms must be consistent with culture. In principle, a cultural ‘fact’ can cast doubt on a psychological theory.

BOX 2.5 A COMPARISON OF HUMAN BEHAVIOURAL ECOLOGY AND EVOLUTIONARY PSYCHOLOGY

	Human behavioural ecology	Evolutionary psychology
Primary focus	Behavioural strategies	Psychological adaptations
Affiliated with	Social anthropology	Cognitive and social psychology
Location of key cause	Ecological variables	Cognitive mechanisms
Hypothesis generation	Optimality models	Inference from past selection pressures
Primary methods	Quantitative observation	Survey and experiment
Outcomes measured	Overall fitness	Expressed preferences; cognitive responses
Favoured topics	Subsistence, reproduction	Mate choice, sex differences

Human behavioural ecology seeks to formulate hypotheses regarding variations in the behavioural strategies of individuals trying to maximize their inclusive fitness whereas evolutionary psychology seeks to formulate hypotheses that specify the operation of the adapted psychological mechanisms that shape and drive behavioural response and choice. Let us take a look at an example. HBE has since its inception in the mid-1970s been concerned with foraging behaviour in traditional cultures (Winterhalder & Smith, 2000). Courtesy of optimal foraging theory and working on the assumption that a given forager has as his or her objective the maximum return as measured by calorific and nutritional value human behavioural ecologists look to predict what foods will be searched for over which range and for how long. Looking at the same phenomenon the evolutionary psychologist would seek to specify the cognitive mechanisms that underlie the observed behaviour, demonstrate their operation in a controlled setting, and ask if it is plausible to say that they can be characterised as psychological adaptations.

THE STANDARD SOCIAL SCIENCE MODEL

The **standard social science model** is a thesis in the history of ideas. As presented by Tooby and Cosmides, the standard social science model (hereafter the SSSM) is all that evolutionary psychology is not. If for no others reason, then, it is worth our while seeing what the SSSM is because it should help us to see what evolutionary psychology is.

The standard social science model is, according to Tooby and Cosmides, ‘The consensus view of the nature of social and cultural phenomena that has served for a century as the intellectual frame work for the organisation of psychology and the social sciences and the intellectual justification for their claims of autonomy from the rest of science’ (1992: 23). Tooby and Cosmides argue that the autonomy of the psychological and social sciences from the natural sciences is grounded in the belief that ‘a “constant” (the human biological endowment observable in infants) cannot explain a ‘variable’ (inter-group differences in complex adult mental or social organisation)’ (ibid.: 26). Accordingly,

... the SSSM concludes that ‘human nature’ (the evolved structure of the human mind) cannot be the cause of the mental organisation of adult humans, their social systems, their culture, historical change, and so on... . Whatever ‘innate’ equipment infants are born with has traditionally been interpreted as being highly rudimentary ... Because adult mental organisation (patterned behaviour, knowledge, socially constructed realities, and so on) is clearly absent from the infant, infants must ‘acquire’ it from some source outside themselves in the course of development. That source is obvious: This mental organisation is manifestly present in the social world ... the social (or cultural or learned or acquired or environmental) ... contains everything complexly organised ... The cultural and social elements that mould the individual precede the individual and are external to the individual. The mind did not create them, they created the mind ... [the] action of the social world on the individual is compulsory and automatic – ‘coercive’ to use Durkheim’s phrase ... (Ibid.)

Tooby and Cosmides argue that the ‘cognitive turn’ in the 1950s and 1960s offered the SSSM a new, technical cloak and jargon in the form of the metaphor of mind as being a general-purpose information-processing machine that obtains its programs from culture. The essential features of the standard model view were retained in that ‘human nature is an empty vessel, waiting to be filled by social processes’ (Ibid.: 29).

Though specific in their portrait of an intellectual tradition, Tooby and Cosmides are general with regard to disciplinary focus. With specific reference to psychology, they claim:

In the SSSM, the role of psychology is clear. Psychology is the discipline that studies the process of socialisation ... Thus the central concept in psychology is learning. The prerequisite that a psychological theory must meet to participate in the SSSM is that any evolved component, process, or mechanism must be equipotential, content free, content independent, general purpose, domain-general, and so on. Moreover, their structures must themselves impose no particular substantive content on culture. (Ibid.: 29)

Tooby and Cosmides' SSSM thesis can be summarised as a set of commitments that are said to have dominated psychology and the social sciences more generally. These are: (a) that mind, aside its capacity to learn, is a *tabula rasa*; (b) that culture is the cause of mental content; (c) that culture is independent of mind; and (d) that psychology should be concerned with the study of enculturation. These four notions are, then, the fundamental propositions – be they explicitly stated or implicitly assumed – that constitute social science. According to Tooby and Cosmides they are commitments in that they are subscribed to by social scientists.

The occurrence of the instinct debate, ethology and sociobiology suggests that standard model depiction of the history of psychology is not reliable. However, for present purposes, criticisms of the SSSM thesis are of limited value and importance. This is because the SSSM in the overall scheme of evolutionary psychology is not essential, and the validity of evolutionary psychology does not ride on the historical accuracy of the SSSM. Still, the SSSM idea does play a part in the story of the rise of evolutionary psychology. The contrast between the standard model and the evolutionary model which evolutionary psychologists propose legitimises the claim that, as a whole, evolutionary psychology is a new approach. As Rose and Rose (2000) have indicated, as a component of evolutionary psychology, the SSSM is one of the elements which distinguishes it from sociobiology and human behavioural ecology. And, as a thesis in the history of ideas, the SSSM, since being introduced by Tooby and Cosmides, has been adopted by a number of authors (Hampton, 2004b) and discussed by evolutionary psychologists 'as though it were a technical abbreviation rather than a rhetorical device' (Kohn, 1999: 19).

THE ENVIRONMENT OF EVOLUTIONARY ADAPTEDNESS

The **environment of evolutionary adaptedness** (EEA) is a methodological tool based on a depiction of our natural history. The term 'environment of evolutionary adaptation' was coined by the developmental psychologist John Bowlby. He used the idea to explain how patterns of attachment between infants and caregivers can be thought of as adaptive responses in infants to differing parenting practises (Bowlby, 1969). As a tool the EEA concept was developed and its utility in evolutionary psychology made explicit by John Tooby and Leda Cosmides (1990b, 1992). There are various synonyms of the term and they include ancestral environment, environment of selection and the general references to the **Pleistocene** era in **palaeoanthropology**. The time period typically evoked by reference to the EEA is most often taken to be the *c.* 1.8 million-year period since the emergence of the genus *Homo* through to either appearance of *Homo sapien* *c.* 150 000 years ago or to the beginning of the Holocene period *c.* 10 000 years ago – a period marked by the emergence of agriculture and a pastoral mode of existence. Occasionally the time period said to mark the beginning of the EEA is relaxed to cover the *c.* 6 million year period since the emergence of the *Australopithecines* and a family of species known as **hominids**.

The key point is that evolutionary psychology takes the EEA to amount to the set of past selection pressures responsible for any given extant adaptation. In Tooby and Cosmides words, 'one can define the environment of evolutionary adaptedness for an adaptation as that set of selection pressures (i.e. of the ancestral world) that endured long enough to push each allele underlying the adaptation from its initial appearance to near fixation (1996: 122).

The place, or location, of the EEA is Africa. More precisely, it is predominantly eastern and, to a lesser extent, southern African (Wilson and Cann, 1992). This placing of the EEA follows the majority view of palaeoanthropologists that modern humanity is 'Out of Africa' (Tattersall, 1997). What this means is that we evolved in eastern Africa and subsequently migrated from that region to others on that continent and around the world. However, we cannot be as sure of the location of the EEA as we can its duration for there is some debate on the matter of where hominid development prior to modern man took place (Stringer, 1990). A view known as the **multiregional hypothesis** does have adherents and it argues that modern humans evolved in various parts of the globe. In practice most evolutionary psychologists do not embroil themselves in detailed palaeoanthropological debates and their research does not rest upon assumptions that could reasonably be called precise when specifying the time and place of a supposed selection pressure and subsequent adaptation.

Accordingly, we may take the following as a workable rule: the EEA (or a functional equivalent) is invoked when any given account of our past or hypothesis concerning extant psychological adaptations makes an assumption(s) about a species of *Homo*, and/or the environment to which it was adapted, and/or the environment to which it needed to adapt. For example, were we to claim that, say, modern humans have an evolved tendency to behave generously towards their family members we would be making the assumption that, as a matter of fact, such behaviour was exhibited by hominids prior to modern humans and that such behaviour was adaptive and fitness enhancing in past environments.

The utility of the EEA concept for evolutionary psychology is that an explicit appeal to our evolutionary past holds out the promise of an account of psychology that is specifically human. Here we need to keep in mind that evolution is a general theory, ultimately mathematical in nature, which claims to account for the functional features of all species. It is not specifically about humans. In fact, applied to all the distinct species that have ever existed, the human story would be difficult to find such would be the size of the library. Motivated as such, the EEA is a tacit admission that evolutionary theory in and of itself is not entirely adequate as a generator of hypotheses about human psychological characteristics or adaptations. Reference to our evolutionary history overcomes this problem. We can use knowledge about our past to generate hypotheses about our psychological adaptations, mechanisms and/or dispositions. Moreover, it helps us to think in a more or less disciplined way about what sorts of psychological adaptations humans might have. Reference to our natural history puts a human face on evolutionary theory and in doing so facilitates the prospect of a normative general theory of human nature. And, reference to our past is



Figure 2.3 Map of Africa

The Out of Africa hypothesis claims that modern humans first evolved in then migrated out of Eastern Africa about 150,000 years ago⁷.

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of a piece with conceptual integration – the proposal that the psychological and social sciences should be mutually consistent – by providing a common ground for hypothesis generation and confirmation.

BOX 2.6 OBJECTIONS TO EVOLUTIONARY PSYCHOLOGY: CONSERVATISM

It has been argued that biological and evolutionary approaches in psychology and the social sciences are seen by default as being supportive of conservative and right-of-centre political views (Pinker, 2002). In turn, conservative and right-of-centre political views are seen as being a defence of the status quo in any given society (Campbell, 1999a). Accordingly, those who object to the status quo, and those of a left-leaning, socially progressive and/or egalitarian political persuasion will be inclined to object to evolutionary approaches.

In actuality, insofar as there is any evidence to support such claims it does not support them. Tybur, et al. (2008) surveyed 168 US students working for a PhD in psychology and found that those purporting to be adaptationists – 37 in all – were more liberal in their views than non-adaptationists.

Still, the idea that evolutionists are inherently conservative fail to see that evolutionary theory is not inherently conservative simply because it is not driven by political values. Evolutionists *en masse* are not seeking to preserve inequalities and hierarchies. Of course, some of its proponents will be right wing. But this is a statement about persons not the theory. But it is also true that some are left wing (Richards, 2005). Indeed, Singer has argued that contemporary evolutionary theory, founded on kin selection and reciprocal altruism, is compatible with socialism and ought to be inculcated into left-wing thinking because it provides a secular account of human nature and social organization, and does not reply upon an ungrounded optimism about how we might behave given the right physical and social conditions (Singer, 1999).

An interesting twist on this issue has been presented by Thornhill and Fincher (2007) who argue that attachment style and life history act to mediate political values and that conservatism and liberalism can be view as “functional and socially strategic in human evolutionary history” (ibid: 215). Their hypothesis is that highly secure individuals who experienced low childhood stress become conservatives, and avoidant individuals who experienced high childhood stress become liberals. They report that tests which scale attachment style, conservatism-liberalism, social dominance and right-wing authoritarianism support their theory.

The next chapter ‘The environment of evolutionary adaptedness’ examines some of the evidence which licenses the claim that modern humans have evolved, and in doing so we will flesh out the details of this important concept. The next section in this chapter we will characterise the claim that our minds are a collection of specific adaptations shaped by natural and sexual selection to solve problem of survival and reproduction.

MINDS ARE COMPOSED OF ADAPTATIONS

The claim that minds are composed of adaptations is a particular philosophy of mind derived from evolutionary theory. The idea is that our minds are made up of evolved psychological adaptations that each of them serve particular and discrete functions. With this claim we come to the aspect of evolutionary psychology which, on the one

hand, ties it most closely to the general thrust of the instinct debate and attempts to discern and classify the components which constitute human psychology, and, one the other, differentiates it from ethology, sociobiology and behavioural ecology. To grasp what it is that evolutionary psychologists mean by saying that our minds are a suite of discrete adaptations it will help to review the argument that the mind is modular.

In the most general terms, for any kind of system, or machine, to be modular it must consist of functionally and/or physically separable units. These units, or modules, are (more or less) specialised. On the one hand, the system – the whole – is nothing more than the sum of its parts (nothing more than its modules). On the other hand, the system achieves a concert beyond that which isolated modules might suggest. There are a number of ideas in psychology that converge toward the modularity view. Let us look at some of them.

Anatomically, the human brain, quite literally, looks modular. Neuroanatomy presents it as a collection of cortices, lobes and hemispheres (Crossman and Neary, 2005). For example, the occipital lobe is at the back of our brains and it facilitates vision. The occipital lobe is to a considerable degree isolated from the parietal lobes at the sides of our brain. The parietal lobes facilitate the control of movement. Similarly, the cerebellum at the base of the brain facilitates vegetative and homeostatic functions and can be isolated from the frontal lobes at the front of the brain facilitate higher-order 'intelligent' thought. Neurology shows us that different parts of the brain are critical for certain processes and these parts are (more or less) unique in their exhibition.

BOX 2.7 MODULARITY AND THE MOTOR CAR: TRY IT HIS WAY

Cars are modular machines. They are made up of many components, each of which does a particular job. For example, the headlights perform a function distinct from head restraints. The headlights can fail leaving the head restraints intact to perform their function, and vice versa. Some components are more important than others with regard to the overall job of the car. The engine, for example, is critical if a car is to get from one place to another. Something as apparently simple as a brake cable is critical if it is to do so safely. The point is that the car as a whole is made up from myriad distinct parts and their functional relations.

Whilst such neuroanatomical considerations facilitate the claim that minds are modular, evolutionary psychology is not concerned with the anatomy and physiology of the central nervous system *per se*. Rather, it is concerned with cognitive processes (the demand for mutual compatibility withstanding). Its focus is on mental or cognitive modularity as opposed to physical modularity.

Advocates of cognitive modularity stress its ecological plausibility and its consistency with evidence from studies of patients with brain damage. Such evidence also suggests that modular systems can suffer local failures without a subsequent global failure. That is, we can suffer physical damage to certain anatomically discrete parts of our brain which, in turn, eliminates or impairs our ability to perform certain cognitively discrete functions, but other functions remain unimpaired. This point is one of the reasons why modularity suits evolutionary psychology – it amounts to good engineering (Pinker, 1997; Tooby and Cosmides, 1992).

There are other ways in which modularity meshes with evolutionary psychology. The most important of these is with the claim that mind is a suite of adaptations. In principle, modular processes should dovetail with solutions to adaptive problems. Tooby and Cosmides argue that if the mind was other than a suite of modular specialised systems – were it to be a general purpose computer which was programmed by experience – it would be too clumsy to be effective in natural environments in real time (Tooby and Cosmides, 1992). Evolutionary psychologists believe the human mind is a complex system of computational mechanisms selected for and shaped by natural and sexual selection. These mechanisms may be readily compared to other organs in our bodies in that they are products of selection pressures designed to perform specific functions. In principle, mind taken to be an adaptation is no different from, in the widest sense, say, gills, and in the narrower sense, say, opposable thumbs. Thus, ‘The human mind consists of a set of evolved information-processing mechanisms ... these mechanisms ... are adaptations, produced by natural selection over evolutionary time in ancestral environments’ (Tooby and Cosmides, 1992: 24).

These considerations are distilled in a proposed method for studying thought and behaviour from an adaptationist standpoint. Tooby and Cosmides have laid out a scheme that ought to be followed in order to find and detail the operation of psychological adaptations (Tooby and Cosmides, 1992). We can illustrate the scheme by providing examples drawn from Cosmides social contract theory which proposes that one of our psychological adaptations is a ‘cheater detector’ which has been selected for and evolved to enable us to spot others who do not reciprocate favours (Cosmides, 1989).

- 1 First, we need to establish ‘an adaptive target’: this amounts to a description of what counts as a biologically successful outcome in a given situation. For example, if we are to engage in reciprocal exchanges we need to avoid those who do not reciprocate.
- 2 We need to establish the ‘background conditions’: this amounts to a description of the features of the EEA that are relevant to the adaptive problem. For example, we need to have some confidence that cheating was common enough to have been a recurring problem through our evolution.
- 3 We need to establish a ‘design’: this amounts to a description of a cognitive processes which would solve the problem. For example, we need to specify how our ancestors would go about detecting cheaters.
- 4 We need to conduct a ‘performance examination’: this amounts to an experimental analysis of what happens when the proposed solution interacts with the proposed problem.

For example, if we say that spotting cheaters involves an up-to-date recollection of who has reciprocated equitably in the past and who has not courtesy of an analysis of the value of assistance exchanged we need to see how well such a mechanism works in experimental conditions.

- 5 We need to conduct a 'performance evaluation': this amounts to an analysis of how well (or how poorly) the proposed design managed to produce the adaptive target (the biologically successful outcome) under circumstances paralleling ancestral conditions. The better the mechanisms performs, the more likely it is that one has identified an adaptation. For example, if we do not need to suppose that anything other than spotting cheaters involves an up-to-date recollection of who has reciprocated equitably in the past and who has not courtesy of an analysis of the value of assistance exchanged in order to account for how people manage not to get cheated most of the time in ordinary day-to-day circumstances, which, we may reasonably suppose, are much like those that our ancestors encountered, then we can conclude that we have found and described a psychological adaptation.

The five steps detailed above amount to an answer to the question 'what is evolutionary psychology?' It is the search for the evolved species typical modes of thought that underpin our behaviour. As we can see, and as the central place of the EEA in evolutionary psychology suggests, the place to start the search is with the adaptive target – the biologically beneficial outcome thought to have been regularly achieved in the past. The construction of ancestral conditions, including the condition of the species in question at the time, then allows us to move on and hypothesise a design. It is to the past – to the natural history of humans – that we will now turn.

SUMMARY OF CHAPTER 2

'Evolutionary psychology' is used as a general term which connotes the use of evolutionary theory in psychology and the social sciences. But it also has a specific denotation wherein it refers to a particular way of thinking about and studying thought and behaviour. It is often touted as being a 'new science' but it has a number of predecessors. These include instinct theory, ethology and sociobiology. It is also not alone in the contemporary landscape of Darwinian approaches that include human behavioural ecology.

Whilst differences do exist between the different approaches and we have also seen that there are clear links between them. Evolutionary psychology shares with instinct theory an emphasis on psychological dispositions, aversions, tastes and proclivities. It shares with ethology a distinction between explanations which emphasis how organisms operate in the here and now and why they have come to exhibit the behaviours that they do. Like sociobiology, evolutionary psychology take a gene's-eye view of adaptations, and like human behavioural ecology it is interested in using depictions of our natural history to define, refine and test hypotheses.

FURTHER READING

Apart from the references in this chapter you may find it interesting and useful to consult one or more the following:

- Cosmides, L. and Tooby, J. (1992) Cognitive adaptations for social exchange. In Barkow, J. Cosmides, L. and Tooby, J. (eds) *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*. Oxford: Oxford University Press.
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