



# Cultural evolution & human nature

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-can the theory of evolution tell us anything about **human behaviour** and/or **culture**?

-social scientists generally say 'no'

-some biologists say 'yes'

-various ways of applying Darwinian ideas to human behaviour/culture

i) sociobiology

ii) evolutionary psychology

iii) human behavioural ecology

iv) memetic

v) gene-culture co-evolutionary theory

# Sociobiology

**sociobiology**: the attempt to applying Darwinian theory to behaviour

**human sociobiology**: applying Darwinian theory to human behaviour and psychology

- in a sense, originated by Darwin himself

- ch. 7 of *Origin, The Descent of Man, The Expression of Emotions in Man and Animals*

- 1950s - 60s Konrad Lorenz pioneered the study of **ethology**

- > the study of **animal behaviour**, usually with an evolutionary focus

- 1975 E. O. Wilson published ***Sociobiology: the New Synthesis***

- provoked huge controversy

- accusations of 'pop science', of 'ideologically motivated pseudo-science' etc.

- undesirable political implications?

- some **human behaviours** look like **adaptations**: fear of snakes, helping ones' siblings

- > but Wilson and later sociobiologists focused on controversial examples:

- incest avoidance, rape, xenophobia, male promiscuity, female 'coyness', infanticide

- Wilson's strategy: construct Darwinian explanations for all of these behavioural traits -posit a selective advantage in an ancestral environment

# Sociobiology

## *Problems:*

- a) experimental **evidence** sparse
- b) most species in hominid clade are **extinct** -therefore standard comparative method not available
- c) problem of **changing environment**
- d) clash with 'folk' psychology, social science, common sense
- e) culture and language have allowed us to 'transcend natural selection'
- f) apparent clash with free-will
- g) what 'behavioural traits' should we focus on?
- explanandum* of the Darwinian hypothesis much less clear-cut

## *Other (less good) objections to sociobiology*

- a) naive adaptationism - untestable hypotheses
- b) genetic determinism
- c) non-universality of behaviour across human cultures

# Sociobiology

## Non-Universality

- a standard objection to sociobiology, but not necessarily a problem
- facultative adaptations (expressed only in some circumstances)
- sometimes, *Darwinian explanations* of non-universality - analogy with Chomsky's work on 'language universals' - different languages compatible with 'Universal Grammar'
- > Do evolutionary and psychological explanations of behaviour conflict?
- many sociobiologists think so
- Sober disagrees
- > distinction between 'proximal' from 'distal' causation

# Evolutionary Psychology

- a 1990s successor to human sociobiology
- > supposedly free from methodological problems of sociobiology
- > main **difference**: focuses not on specific behaviours, but on **psychological mechanisms** that produce behaviour
- easier to reconcile with cultural diversity etc.
- clashes less with our sense of free-will
- > some psychological mechanisms are clearly adaptations
- e.g. visual perception
- but they 're not uniquely human -common to all vertebrates

Leda Cosmides and John Tooby (1992) *The Adapted Mind*

# Evolutionary Psychology

-evolutionary psychologists reject the ***Standard Social Science Model***, i.e. the idea that 'human nature' places only **minimal** constraints on our cultural life

therefore, it falls to social science to explain culture

-SSSM also bound up with idea that the mind is a '**general purpose computer**' that can be programmed to do pretty much anything

-evolution has produced a ***modular mind***, they say

-idea of modularity (Jerry Fodor (1983), *The Modularity of Mind*):

mind consists of ***mental modules***

-these modules contain information-processing mechanisms which are:

a) domain-specific

b) opaque to consciousness

c) informationally encapsulated

-> Fodor is *not* a supporter of evolutionary psychology

# Evolutionary Psychology

- evolutionary psychologists want to find ***Darwinian algorithms*** for doing particular tasks, e.g. social exchange, mate-choice etc.
- not* just the application of ‘general intelligence’ to particular problems, they say
- a general Darwinian argument for modularity, according to EP: would have been a more efficient way of solving problems
- but, (a) is this plausible?  
(b) some cognitive tasks (e.g. playing chess) are clearly not performed using Darwinian modules
- whether evolutionary psychology marks a real advance over sociobiology is a controversial, and as yet unresolved, problem



# Human Behavioural Ecology

- also motivated by dissatisfaction with sociobiology
- emphasises ***behavioural plasticity*** of humans
- same genes leading to different behaviours
- attempts to explain **cultural diversity**
- doesn't assume that **cultural** differences reflect **genetic** differences
- uses ***optimality analysis***
- i.e. assumes that human behaviour is adaptive/optimal, due to long history of **natural selection**
- doesn't suggest that behaviour is directly/solely due to genes
- i.e. selection may have led to behavioural strategies such as:  
'when in situation X, do a; when in situation Y, do b, when in situation ...'
- i.e. rigid genetic determinism **rejected**
- but behaviour still **partially** genetic, in a sense
- aim: to see whether various human behaviours, in local cultures, are optimal

# Human Behavioural Ecology

examples:

(i) foraging strategy -single or groups?  
what's the optimal group size?

(ii) marriage practices  
why polygamy in some places, polyandry in others?  
can it be explained as optimal, given local conditions?

(iii) 'demographic transition' in industrial societies  
i.e. breakdown of correlation between wealth and number of  
offspring  
is there an adaptive explanation?  
e.g. might the changed conditions, post industrial revolution,  
change the optimal number of offspring?

# Human Behavioural Ecology

-> in 1990s evolutionary psychologists criticised human behavioural ecology on a number of grounds:

(a) 'currently adaptive' doesn't imply 'is an adaptation'

(b) we 're probably better adapted to hunter-gatherer conditions

-what was adaptive then, won't necessarily be so now

-> therefore, looking for current benefit of behaviour isn't a guide to evolution

-> environment has changed too much

(c) behaviour may well be sub-optimal/maladaptive

-especially if we 're better adapted to a different environment

-> human behavioural ecologists don't usually consider this

(d) correct focus is not *behaviour*, but ***psychological mechanisms*** that underpin behaviour

# Memetics

- based on Richard Dawkins' concept of a meme
- basic idea: memes are ***cultural replicators***
- modelled on genes
- memes are **units of culture** (whatever exactly that means)
- e.g. songs, ideas, stories, beliefs, theories, cultural practices

Dawkins: memes possess variation, heredity and differential fitness

-> hence should evolve by the Darwinian process

-fittest memes spread at expense of less fit

Dennett: human mind is an artifact created by memes for memes!

-> by analogy with what Dawkins says about organisms and genes



# Memetics

- memes spread **horizontally**, not just vertically
- > often by imitation
- > can be interesting to think of memes as **cultural parasites**

e.g. Susan Blackmore: 'Western culture is the Bible's way of making more Bibles. And why is it [the Bible] so successful? Because it alters its environment in a way that increases the chances of it being copied. It does this, for example, by including within itself many instructions to pass it on, and by describing itself as indispensable to the people who read it'.

-but is memetics a serious way of thinking about the evolution of culture, or not?

# Gene-Culture Coevolutionary Theory

basic ideas:

- (i) **culture** can evolve **independently** of genes
- (ii) cultural evolution and genetic evolution can **interact**

-stresses that culture is transmitted across generations and horizontally

this is ***cultural inheritance***

-> cultural inheritance can affect genetic evolution and vice-versa

-Feldman & Cavalli-Sforza produced mathematical models of this process in 1980s

# Gene-Culture Coevolutionary Theory

## **Example**

co-evolution of dairy farming and genes for processing milk

- dairy farming skills passed on culturally  
(though obviously dependent on genes for general cognitive ability)
- led to a change in selection pressures on genes  
-> selection for genes for lactose-absorption  
(dairy products make most humans ill)
- this in turn can feed back, making dairy-farming cultures more successful
- > two way interaction between evolution of genes and culture
- sometimes, culture can speed up genetic evolution
- othertimes, culture shields genetic variation from selection, hence slows down genetic evolution (cf. medical advances)
- > no suggestion that culture is determined by genes, in any useful sense

For further study:

Godfrey-Smith, ch. 8

Downes 'Evolutionary Psychology' [**SEP**]

Hull (1986) 'On human nature', *PSA 1986 Volume 2*: 3-13.

Kitcher (1993) 'Four ways of "biologizing" ethics' [**CIEB**]

Lewens (2006) 'Mememes' in *Darwin*, Routledge.

Machery 'A plea for human nature', *Philosophical Psychology* 21:  
321–329.