

Psychology BSc –

General Foundations Module

Evolution and Psychology



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Aims and Objectives

- *Aims: These two lectures aim to refresh students' knowledge of the theory of evolution, or to introduce them to it, and to introduce them to aspects of psychology which have been influenced by evolutionary approaches.*
- *Objectives: By the end of the lectures the students should:*
- *know the general outlines of the theory of evolution and the time course of human evolution*

Objectives continued

- *be able to answer correctly a majority of the questions on the self-assessment test included in the handout*
- *understand some of the key differences between nativist and empiricist theories in psychology*
- *be aware of the sections of the course text (Gleitman, 1999) where evolutionary approaches are applied to perceptual, cognitive, emotional and social aspects of psychology.*

Topics to be covered

- The theory of evolution
- What Darwinians say about psychological topics
- Schools of thought influenced by Darwinian approaches
- Areas of psychology that have been or could be influenced by these approaches

Format of lectures

- There will be a very brief coverage of a large number of areas
- The question addressed is a general one: what is the relevance of evolution for psychological topics?
- The answer to be given is in terms of the 'nature/nurture' issue.

Gleitman et al. (1999, page 436) agree that it is arguable that human social behaviour is “so thoroughly infused by culture” that comparisons with the Darwinian influences on animal behaviour are fruitless.

Basic Reading see p. 1 of handout

Basic Reading (page 1 of handout)

Gleitman et al., (2004) *Psychology* 6th edition, or Gleitman et al., (1999) *Psychology* 5th edition, or Gleitman, (1995) *Psychology* 4th edition.

<i>Page reference in Gleitman et al 2004</i>	<i>Page reference in Gleitman et al 1999</i>	<i>Page reference in Gleitman 1995</i>	<i>Textbook Heading</i>
see 416-7	406-9	380-83	“Natural Selection and Survival”
5-6	3-4	3-4	“Displays”
152-4	152-4	141-2	“Differences in what different species learn”
197-201	192-7	175-180	“Evolution and sensory equipment”
338-342	373-4	350-1	“The growth of language in the child”
353-357	390-4	367-375	“The critical period hypothesis & Language in non-humans”
416-417	405-37	379-413	“The biological roots/basis of social behaviour”
451-458	476-81	443-448	Emotions and facial expression
438-440	494	455-6	“Reciprocal altruism”/“The roots of reciprocity”
478-484	552-7	511-6	“What is the cognitive starting point?”
506-510	576-9	534-7	“The roots of attachment.”
632-634	747-50	702-5	“The sociocultural perspective”

The Theory of Evolution

- Resources are not unlimited
- Some individuals will flourish more than others and produce more offspring
- There are inherited differences between individuals
- Natural selection occurs if a population changes over generations because of this (see Lazarus, 1987)

- Ethology: scientific study of innate factors in animal behaviour (N. Tinbergen and K. Lorenz, Nobel Prize, 1973)
- Sociobiology: as above, but emphasis on social behaviour (E.O. Wilson, 1975)
- Evolutionary Psychology: emphasis on the effects of human evolution on human psychology (Tooby and Cosmides, 1992)

Areas of psychology influenced

- Animal psychology has been most influenced (ethology & sociobiology)
- Psychologists interested in human language and perception now point to innate mechanisms (Pinker, 1994)
- Social psychologists appeal to cultural influences and are generally against innate factors (Harre, 1986)

Review of innate influence in areas of human psychology
(p3 on handout)

- **Perceptual systems:** vision; colour vision.
Also motor systems, and eye-hand co-ordination
- **Cognitive systems:** built-in concepts of time, space and physical reality; the bioprogram for 1st language learning
- **Emotionality:** facial expressions as displays
- **Social systems:** bioprograms for social interaction? (Tomasello *et al*, 1993)

Social systems: extra comments (p3)

- human intelligence may have evolved because of its importance in social interaction, especially to cope with social exchange rules (Gleitman, 1999 p. 494)
- natural inclinations are not necessarily desirable: cultural systems may have often developed to supplant them (Hobbes, 1651; Gleitman, 1999, p. 405 & p. 437)

Nature Versus Nurture in Different Areas of Human Psychology

<p>(page 7 of handout)</p>	<p>Innate (Nativists)</p> <p><i>Predetermined, biologically predisposed, constraints on learning</i></p>	<p>Acquired (Empiricists)</p> <p><i>Individually learned, culturally transmitted, social absorption or formal training</i></p>
<p>Cognitive Processes:</p> <p><i>Perception Language Reasoning</i></p>	<p>Plato Chomsky (1959, 1986) Fodor (1983) Evolutionary Psychology (Pinker and Bloom, 1990; Cosmides, 1989)</p>	<p>Aristotle Empiricist philosophers Behaviourists Connectionists, e.g. Rumelhart and McClelland (1986) Tomasello <i>et al.</i>, (1993)</p>
<p>Social Processes:</p> <p><i>Emotions Motives Social Structures</i></p>	<p>Freud, Jung Structural anthropologists (e.g. Levi-Strauss) Sociobiologists Ethologists Evolutionary Psychology</p>	<p>Empiricist philosophers Social anthropologists Many psycho-analysts Most social psychologists: The “Standard Social Science Model”</p>

Pinker, S. (1994) *The Language Instinct*. pp 419-20.

- “So what are the modules of the human mind?”
- “Using biological anthropology, we can look for evidence that a problem is one that our ancestors had to solve in the environments in which they evolved —
- so language and face recognition are at least candidates for innate modules, but reading and driving are not.”

Genes and Language:

- Psycholinguists such as Noam Chomsky and Steven Pinker have been convinced since the 1960's that language capacity is innate.
- In the last few years, particular genes involved with language capacity have been discovered.

Pinker, S (1998) How the Mind Works. Allen Lane, London p 32.

- “Throughout the book we will run into other lines of evidence that our mental organs owe their basic design to our genetic program.”
- “It’s not that the claim that there is an interaction between innate structure and learning (or between heredity and environment, nature and nurture, biology and culture) is literally wrong. Rather, it falls into the category of ideas that are so bad they are not even wrong.”

Pinker, S. (2002) *The Blank Slate*

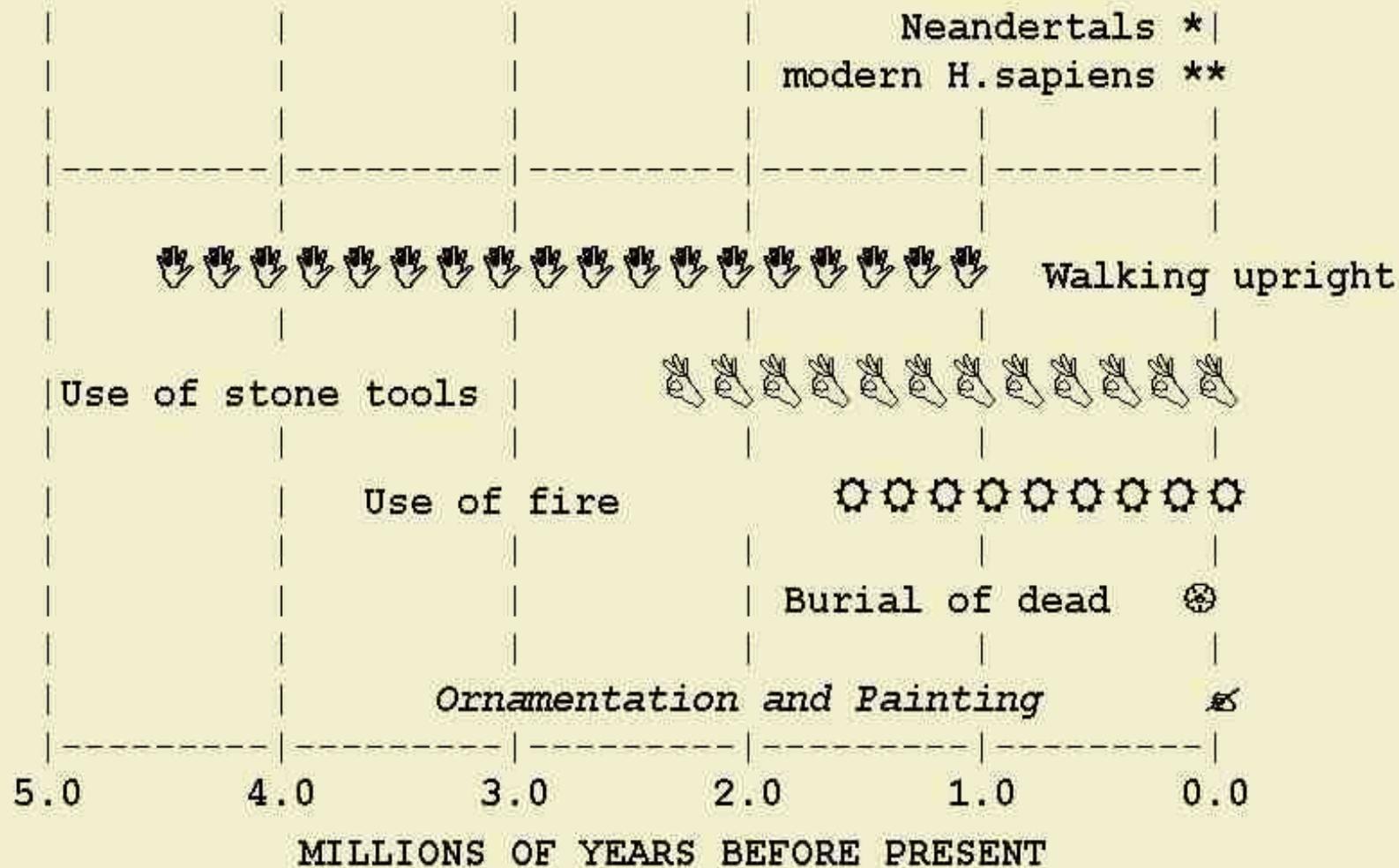
- p. 31. “The first bridge between biology and culture is the science of mind, cognitive science.”
- p. 78. *Of course* “the wonderful diversity of the human species is not hard-wired in our genetic code,” but we don’t need to count genes to figure that out.

Pinker, S. (2002) *The Blank Slate*

- p. 35. “This is not to say that cognitive scientists have put the nature-nurture debate completely behind them: they are still spread out along a continuum.....”
- p. 60. Take the case of a person’s mother tongue, which is a learned cultural skill par excellence....The innate endowment for language is in fact an innate mechanism for *learning* language.

Pinker, S. (2002) *The Blank Slate*

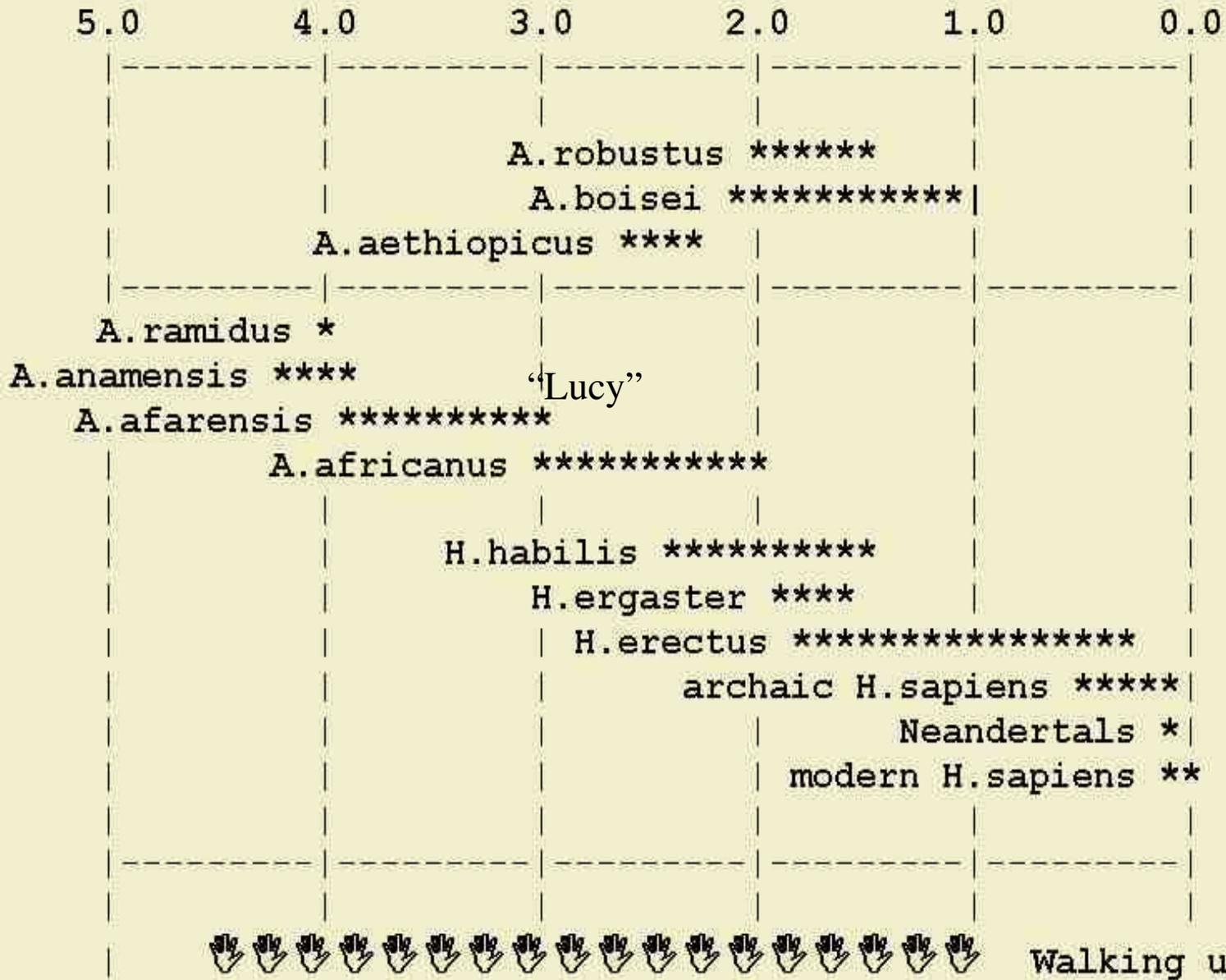
- p. 69. “The ultimate irony of the Standard Social Science Model [the blank slate] is that it failed to accomplish the goal” [of explaining cultural differences.
- The best explanation today is thoroughly cultural, but it depends on seeing culture as a product of human desires rather than as a shaper of them.



These are time lines for "Hominids" - species regarded as members of the human family tree.

Brain size was little bigger than in modern apes in the Australopithecenes, rather bigger in H. habilis, more than twice as big in H. erectus, 3 times the size in modern H. sapiens, and actually a little bigger than this in Neanderthals.

MILLIONS OF YEARS BEFORE PRESENT



What is the cognitive starting point?

- “Very young infants begin life with primitive concepts of space, objects, number, and even the existence of other minds.” (Gleitman, 1999; p. 552: 1995, p. 511)
- E.g. depth perception in the “visual cliff”.

Quotes from Archer (2001) “Evolving theories of behaviour”

- “... a single unifying starting point for understanding why we think and behave as we do today: natural selection has made us this way”. (p. 414)
- “A ‘sweet tooth’ is adaptive when sugar is relatively rare, but not in present conditions when sweet foods are constantly available. p. 417.
- The fight –and-flight response is adaptive for responding actively to predators, but not when trapped in a traffic jam.” p. 417.

Quotes from Segal (2001) “Main agendas and hidden agendas”

- “Yes, the human species evolved and has survived; but natural selection made us in what way, exactly?” (p.422)
- “What millions of years of genetic change have actually produced is the potential for human cultural invention.” (p.423).
- “In the UK in the 1990s, women overall delayed giving birth until their thirties. The proportion of women remaining childless increased steadily over recent decades.” (p 412)

	INNATE (Nativists) <i>Predetermined, biologically predisposed, constraints on learning.</i>	ACQUIRED (Empiricists) <i>Individually learned, culturally transmitted, social absorption or formal training</i>
COGNITIVE PROCESSES:	Plato	Aristotle
<i>Perception</i>	Chomsky (1959, 1986)	Empiricist philosophers
<i>Language</i>	Fodor (1983)	Behaviourists
<i>Reasoning</i>	Lightfoot (1989)	Connectionists, e.g. Rumelhart and McClelland (1986)
	Evolutionary Psychology (Pinker and Bloom, 1990; Cosmides, 1989)	Tomasello <i>et al.</i> , (1993)
SOCIAL PROCESSES:	Freud, Jung	Empiricist philosophers
<i>Emotions</i>	Structural anthropologists (e.g. Levi-Strauss)	Social anthropologists Some psycho-analysts
<i>Basic Motives</i>	Sociobiologists	Social psychologists
<i>Social Structures</i>	Ethologists	Social constructionists
	Evolutionary Psychology	The “Standard Social Science Model”.

*Nature versus Nurture in
Different Areas of Human
Psychology
(page 7 of handout*

Conclusion (p. 4 of handout)

- Darwinian evolution has shaped many aspects of human cognition
- starting with the capacities of our perceptual systems
- and arguably including higher-order aspects of cognitive and emotional biases.
- But biologically based predispositions do little to diminish
- the profound role of cultural and historical influences on uniquely human intellectual achievement and social diversity