

9.20 M.I.T. 2013

Lecture #27

Sociobiology and Culture

John Alcock, *The Triumph of Sociobiology*, ch 8:

What is the brain, really?

1. Explain the statement (p 150), that “the brain is essentially a reproductive organ....”

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Like every other organ or mechanism that living things are born with, since they have evolved largely by the processes of natural selection—based on the maximal transmission of genes.

John Alcock, *The Triumph of Sociobiology*, ch 8:

A thought experiment: the consequences of blank slate brains

2. What would the long-range evolutionary outcome be if, at a given time, most people had “blank slate” brains at birth? [p 153](#)

John Alcock, *The Triumph of Sociobiology*, ch 8:

A thought experiment: the consequences of blank slate brains

2. What would the long-range evolutionary outcome be if, at a given time, most people had “blank slate” brains at birth? [p 153](#)

They would be taken advantage of – exploited – by variants who had more targeted brains. With genetic variation, the totally blank-slate individuals would decrease and disappear.

Noam Chomsky:

"The blank slate brain is a dictator's dream."

Conditional strategies [Review from Scott book]

3. Conditional strategies are common in humans. Give an example of a conditional strategy in an insect, showing that insect behavior is not always rigidly pre-programmed.

p 156-159

John Alcock, *The Triumph of Sociobiology*, ch 8:

Conditional strategies

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A Rove beetle in Costa Rica, *L. versicolor* is a dung beetle that feeds on flies. Large males are territorial, with larger jaws. Smaller males mimic female behavior and are courted by the larger males; while being courted, they can catch flies and mate with females. The same males change to male behavior in different situations.

Rove beetles



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John Alcock, *The Triumph of Sociobiology*, ch 8:

Conditional strategies

Be sure to note that individuals following one or another mating strategy are probably not different genetically. The underlying genes could be the same, but could code for the development of conditional strategies.

John Alcock, *The Triumph of Sociobiology*, ch 8:

Types of learning as specific adaptations [Review from Scott book]

4. Learning mechanisms have evolved in order to increase fitness – to increase the likelihood that an individual's genes will be reproduced. As a result, these mechanisms are less general than many learning theorists have claimed. They are specific to different situations.

Give an example, from the learning of ingestion-related behavior in rats as studied by John Garcia.

p 162

Types of learning as specific adaptations

4. Learning mechanisms have evolved in order to increase fitness – to increase the likelihood that an individual’s genes will be reproduced. As a result, these mechanisms are less general than many learning theorists have claimed. Give an example, from the learning of ingestion-related behavior in rats as studied by John Garcia. p 162

Skinner’s “universal laws” of reinforcement learning are violated in the poisoned bait effect. (How is this kind of learning different?) See earlier discussion of Scott’s book. Class 16.

Also, note that different kinds of negative reinforcement have very different consequences in the learning of food preferences, studied in rats:

- Electric shock to the skin after ingestion has little effect on future preferences.
- X-ray exposure that makes the rat feel sick after it eats or drinks something results in avoidance of the substance subsequently.

John Alcock, *The Triumph of Sociobiology*, ch 8:

Channeled nature of learning abilities

5. Give two or three examples of the channeled nature of learning abilities in humans. Are there similar special abilities in animals?

p 167f, 171-173

Channeled nature of learning abilities

Humans:

- Language acquisition
- Anticipation of the actions of others with a sense of others' intentions based on what we attend to and learn.
- Learning of faces for later recognition
- *Which of these abilities are shared with other animals, especially primates?*

Animals:

- Bird song learning (as studied in white-crowned sparrows and in zebra finches)
- Finding specific places by birds that cache food supplies (also done by mice and some other animals)
- Maze learning by rats, adapted to living in complex tunnels
- *Etc.*

Why do humans engage in behaviors that seem to reduce their fitness?

- **They may not really reduce fitness; they are Darwinian puzzles. Sociobiologists attempt to solve them.**
 - Keep in mind that behaviors that evolved to increase fitness may no longer do so in greatly altered environments.
- **Examples:**
 - Pet love (previously discussed);
 - Alcoholism A preference probably evolved because alcohol was present in ripe fruits, which are healthy to eat.
 - Acts of altruism: studied by Robert Trivers (1985) and by Richard Alexander (1987): reciprocal altruism, and the value of a reputation for charitability
 - Use of spices? (*next question*)
 - Voluntary reductions in family size; the demographic transition (*question 7*)

John Alcock, *The Triumph of Sociobiology*, ch 8:

The use of spices as a Darwinian puzzle

6. The use of spices in cooking seems at first to be a human luxury with no particular adaptive value, and thus their widespread use, and the great value placed on spices in human history, presented a Darwinian puzzle. What adaptive value of spices has been proposed and supported by data? [p 177-179](#)

John Alcock, *The Triumph of Sociobiology*, ch 8:

The use of spices as a Darwinian puzzle

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p 177-179

Anti-microbial properties. Hence, used more in hot climates. See p 179 figure.

Also note: East African practices by Maasai and Batemi. They use plant additives in milk that lower cholesterol (saponins, phenolics)

The demographic transition

7. Define the “demographic transition” in human populations. It presents a Darwinian puzzle, for which the proposed solutions are incomplete. **See p 183 figure.**

Note that a decline in average fertility began in several European countries in the late 1800s, and in a few others in the early 1900s. Thus, it began before the development of modern birth control methods.

The demographic transition

Observed reduction in female fertility: Are there fitness advantages?

- Evolutionary advantages of timing of pregnancies
- Advantages of acquiring wealth to pass on to children, grandchildren
- Omitted in text: Effects of overcrowding, which include, in animal studies, reduction in fertility.
- Also of great importance: Humans evolved under conditions of limited communication and relatively small group sizes. Rapid long distance communication and awareness of population sizes and their consequences is very recent in evolutionary time.

Read Alcock's discussion of how traits that had evolved to improve genetic fitness have resulted in reduced genetic fitness in wealthier people, not only because of modern contraceptive methods but also because of societal legal restrictions.

John Alcock, *The Triumph of Sociobiology*, ch 8:

Sociobiology and rape

8. See Appendix, Q1 about rape

“Barbara Ehrenreich says that because the children sired by rapists in the past surely were more likely to die than those of paternal nonrapists, rape cannot possibly be an evolved adaptation [*Time*, 2000]. Is she correct? Why might she make this claim?”

Sociobiology and rape

8. See Appendix, Q1 about rape

Actually 2/3 do not fail to ejaculate, so sociobiological explanations are not refuted.

“Barbara Ehrenreich says that because the children sired by rapists in the past surely were more likely to die than those of paternal nonrapists, rape cannot possibly be an evolved adaptation [*Time*, 2000]. Is she correct? Why might she make this claim?”

Not a good argument because many do survive.

→ She may make the claim because she does not want anyone to consider rape as “natural” behavior.

Is rape a “natural” behavior?

- It is practiced only by a small minority of men, hence it is not natural in the usual sense.
- In some species, forced copulation is more widespread.
- However, it becomes more common in humans under certain conditions, as in wartime conquests. (Thus, it could be considered to be a “conditional strategy”—however abhorrent this seems.)



John Alcock, *The Triumph of Sociobiology*, ch 8:

Testing a cultural determinism hypothesis

9. See Appendix, ch 8, Q2 about parental care/

How could you test this hypothesis?

Testing a cultural determinism hypothesis

How could you test this hypothesis? (Are all male-female differences in parental care learned?)

- *Cross-culture studies. Why is it that nearly all cultures are similar in this?*
- *Twin studies: Are variations in parental care genetically influenced?*
- *Deliberate attempts by caregivers to influence children...*

John Alcock, *The Triumph of Sociobiology*, ch 8:

Explaining reactions against sociobiologists' hypotheses

10. See Appendix ch 8, Q3 about males seeking multiple fertile partners

- Richard Lewontin: “I’m a man, and I don’t go around screwing young girls. I’m human, and so I have to be explained.” Why would a sociobiologist not be impressed by this criticism?
- Some men claim loudly that they are monogamous: How might a sociobiologist explain why this occurs?

Explaining reactions against sociobiologists' hypotheses

- Answering Lewontin, from a sociobiological perspective:
 - Sociobiology is not about “always”; its findings are not disproved by “sometimes”.
- Why might a man proclaim loudly that he is monogamous?
 - It might convince his mate to be so too, so she will have only his kids.
 - It may give the man more influence/ power in social groups.
 - The “loudly” is suspicious: He may be doing that to get his neighbors to lower their guard.

Practical issues in thinking about and collecting data on adaptations

John Alcock, *The Triumph of Sociobiology*, ch 9:

Misuse of scientific findings

1. Give three examples of the misuse of scientific findings or claims in service of political goals. At least one of these examples should concern sociobiology or Darwinian theory.

P 189-192

John Alcock, *The Triumph of Sociobiology*, ch 9:

Misuse of scientific findings

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P 189-192

- A “eugenics” argument: Nazi claim that racism, and even genocide, was based on genetics
- 19th century “social Darwinism”: used to justify dominance and superiority of the rich
- The claim that infidelity is natural, therefore understandable, therefore, justifiable. (See Q#7)
- Similarly, claims justifying the subjugation of women

John Alcock, *The Triumph of Sociobiology*, ch 9:

Separating what people actually do from what they ought to do or should do

2. Formulate two statements summarizing a sociobiological finding, in the following manner: For one of them, make it sound like people ought to behave in a certain way. Then re-state the finding in a more objective way.

P 193

Separating what people actually do from what they ought to do or should do

2. Formulate two statements summarizing a sociobiological finding, in the following manner: For one of them, make it sound like people ought to behave in a certain way. Then re-state the finding in a more objective way.

P 193

Statement: “It is natural to being male for men to want to have power and dominance over others, including women.” *This sounds like approval or justification.*

Re-statement: Men, more than women, have a tendency, on average, to strive for positions of power and dominance.

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John Alcock, *The Triumph of Sociobiology*, ch 9:

Medical issues

3. Give an example of a medical issue that can be illuminated by sociobiological ideas and data.

P 195-196

John Alcock, *The Triumph of Sociobiology*, ch 9:

Medical issues

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P 195-196

Morning sickness (discussed by Alcock)

Fever

Pain

Each of these has been found to have fitness benefits in a sociobiological sense.

John Alcock, *The Triumph of Sociobiology*, ch 9:

The birds and the bird watchers

4. Why are studies of the behavior of white-fronted bee-eaters (birds) relevant to human behavior?

P 196-201

The birds and the bird watchers

4. Why are studies of the behavior of white-fronted bee-eaters (birds) relevant to human behavior? pp 196-201

Both species have families that persist over long time periods – so they have had similar selective pressures. The helping by “helpers at the nest” is by offspring, usually full siblings (sharing about 50% of genes)

- How beneficial is the helping? See figure, p 198
 - 3 adults needed for 1 surviving chick; 5 adults for 2 surviving chicks
- What conflicts arise? (Father with male offspring)
- What happens when a female mate dies?
 - If the male gets another female mate, how does his male “helper” respond?

The answers to these questions have parallels in human behavior.

John Alcock, *The Triumph of Sociobiology*, ch 9:

Remarriage and step families

5. What does adaptationist thinking (by sociobiologists) predict about human marriage and step families?
(These predictions have been tested and verified.)

See p 200-203

John Alcock, *The Triumph of Sociobiology*, ch 9:

Remarriage and step families

5. What does adaptationist thinking (by sociobiologists) predict about human marriage and step families?

(These predictions have been tested and verified.)

See p 200-203

- More conflict within step families (less stability), at least when children are involved.
- Greater child abuse by step parents, especially step fathers. See figure p 202, on the frequency of criminal child abuse in families.
- More divorce when there is a greater number of step children.

John Alcock, *The Triumph of Sociobiology*, ch 9:

Male-female differences

6. What important kinds of data on male-female differences are not mentioned by Alcock (on p 204f)?

Behavioral differences (on average), with brain correlates, found by neuropsychologists in the following areas:

- Verbal abilities
- Spatial abilities
- Linear logic; quantitative analysis
- Social and emotional intelligence and sensitivities

John Alcock, *The Triumph of Sociobiology*, ch 9:

The naturalistic fallacy

7. What is the “naturalistic fallacy” often made by people, including some scientists, who are opposed to sociobiology’s studies of human nature?

”An evolved tendency is natural, and therefore acceptable and justified.” (See Q2 above.)

John Alcock, *The Triumph of Sociobiology*, ch 9:
Rape as a show of power over females

8. Is it true that “all rape is an exercise in power” and is not about sexual desires?

Susan Brownmiller (1975), *Against Our Will*. Her views became very widespread, and have been taught to students at many universities, in propaganda on the “myths about rape.”

John Alcock, *The Triumph of Sociobiology*, ch 9:

Rape as a show of power over females

8. Is it true that “all rape is an exercise in power” and is not about sexual desires?
 - Not true.
 - Also note that it is widespread among animals, although certainly not in all species.
 - What are some of the actual findings of studies that have collected real data? *See especially p 210-211, and Fig 9.5: “Age distribution of rape victims differs significantly from that of homicide victims”*
 - Peak age for rape victims was 22-23
 - Peak age for murder victims was 32-33, and the distribution falls off with age less steeply

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John Alcock, *The Triumph of Sociobiology*, ch 9:

Sex education for young people based on sociobiology?

- Alcock's fantasy of a sex education class: would it actually work?
- I believe that it would work only for true intellectuals: those whose knowledge and reasoning actually influence their behavior.
- Such true intellectuals are very rare, hence, the class would most likely be a failure at most schools, if not all.

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