

9.20 M.I.T. 2005

Class #22

Genetic influences on social behavior

John Alcock, The Triumph of Sociobiology, ch 3: Genetic determination?

1. What is the difference between genetic determination of behavioral traits and sociobiologists' views concerning genes and behavior?
(p 41-43, p 20)

Note especially the following:

- “The genetic studies immediately relevant to sociobiology are not developmental genetics but population genetics.... Sociobiologists deal directly with the consequences of populational changes in the frequency of the different variants (alleles) of given genes, not with the physiological means by which particular alleles shape or influence the biochemical pathways of developing individuals. The failure to distinguish between ultimate and proximate research in biology is at the heart of the unfair charge that sociobiologists are trying to establish that Genes-R-Us.”
- The critics argument, designed to be plausible (p 42-43) ends up talking about the existence of “traits that are hereditary, fixed, inevitable, and unchangeable except by future selection for hereditary alternatives...”

John Alcock, The Triumph of Sociobiology, ch 3:
Debunking a myth

2. Sociobiology has often been deprecated by recitation of the “myth of the deterministic sociobiologist.” Give some reasons why this myth has been so enduring since the publication of E.O. Wilson’s book that gave the field its name.

(p 44-46)

- A convenient strawman
- Human psychology: belief in our ability to change our behavior, and other people’s behavior
- For some, the flexibility of human behavior is “mistakenly taken as evidence that cultural factors are the *only* real determinants of our actions.”
- Championing free will and freedom of action

John Alcock, *The Triumph of Sociobiology*, ch 3:
Can a difference in one allele change behavior?

3. Interpret figure 3.1 by explaining how a difference in one allele (B vs b) could result in a behavioral difference between two adults.

(p 46-47; cf p 72)

Note that the figure depicts a kind of multiplier effect

John Alcock, The Triumph of Sociobiology, ch 3:
Changing gene frequencies

4. Explain exactly how the relative frequency of alleles B and b in Q3 could change over multiple generations.

- **If b resulted in death before the age of reproduction**
- **If b resulted in a behavioral difference that reduced the probability of successful reproduction in particular environments but not other environments**
- **If b resulted in no change in probability of reproduction, but reduced parental care**
- **Etc.**

John Alcock, The Triumph of Sociobiology, ch 3:
Breeding for behavioral traits

5. Give an example of an artificial selection experiment that has shown strong genetic influences on behavior. How has this been supported by studies of humans?

(p 49-52)

- Selective breeding of crickets, fruit flies, rats, mice...
- Twin studies

John Alcock, The Triumph of Sociobiology, ch 3:

DISCUSSION

6. Each student should try to prepare an answer to at least one of the **three questions in the Appendix for ch 3.**