

TITLE: Sex, Evolution and Behavior (2nd Edition)  
 AUTHORS: Martin Daly and Margo Wilson  
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Sociobiology, a potentially unifying paradigm for the behavioural sciences, burst brashly onto the academic scene in 1975 with the publication of Harvard Zoologist E.O. Wilson's monumental *Sociobiology: The New Synthesis*. Defined as "the systematic study of the biological basis of all social behavior" (Wilson, 1975, P.4), its central tenet is that individual organisms behave so as to maximize their inclusive fitness by propagating as many of their genes as possible into the next generation. This new perspective, that "the organism is only DNA's way of making more DNA" (Wilson, 1975, P.3.), represented a conceptual advance over Darwin's idea of the survival of the "fittest" individual, for it is now DNA, not the individual, that is "fit". Accordingly, an individual organism is only a vehicle, part of an elaborate device that ensures the survival and replication of genes with the least possible biochemical alteration. Thus, an appropriate unit of analysis for understanding natural selection and a variety of behaviour patterns is the gene. Any means by which a pool of genes in a group of individuals can be transmitted more effectively to the next generation will be adopted. Here, it is suggested, are the origins and mainstays of parental behaviour, social organization, aggression, cooperation, and self-sacrificial altruism. All these phenomena are means by which genes can be more readily transmitted. Dawkins (1976) captured this idea perfectly in the title of his book: *The Selfish Gene*.

The reaction to the publication of *Sociobiology* was immediate and intense. Some behavioural scientists hailed the new perspective as a magnificent and long overdue base from which to biologize and integrate the disparate social sciences. Others, already suspicious of biological reductionism, found the analysis of complex behaviour such as altruism from the conceptual level of "the gene" bordering on the ridiculous. *Time Magazine* (August 1, 1979) called it the most controversial topic of the decade for the social sciences and ran a cover story depicting a man and woman as puppets being pulled about by strings attached to invisible genes. The academic furor was intensified by political activists who objected on moral grounds to the extension of sociobiological theorizing to humans. Those on the left saw in it a basis for sexist, racist, and elitist ideologies, while those on the right saw in it a basis for undermining moral tradition and creationist argument. The melee was depicted well in the title of an essay on sociobiology: "Scientific bandwagon or travelling medicine show?" (Hull, 1978).

Some semblance of reasonableness was introduced into the debate by Michael Ruse, a University of Guelph philosopher, in a 1979 book entitled *Sociobiology: Sense or Nonsense?* Ruse proposed that "Human sociobiology should be given the

chance to prove its worth. If it cannot deliver on its promises, it will collapse soon enough" (p. 214). Well, here we are, 10 years after publication of *Sociobiology*. Is it delivering its promises? One way of estimating this is to examine the amount of scientific research being carried out, and by this criterion there can be little doubt there has been a huge impact. At least three new journals have come into being to keep pace with the output: *Journal of Social and Biological Structures*, *Behavioral Ecology and Sociobiology*, and *Ethology and Sociobiology*, along with several textbooks. It is one of the best of these which is the topic of this review.

Daly's and Wilson's (1983) *Sex, Evolution and Behavior* is now its second edition. (The first was published in 1978.) As the authors point out, their new bibliography contains more than 300 references published since 1979, many of them concerned with our own species, and most carried out to directly test hypotheses derived from evolutionary biology. In this sense, at the very least, sociobiology has fulfilled its promise. That, however, is at the very least. As Daly's and Wilson's text makes clear, the general framework of sociobiology has ordered an immense amount of disparate data on the nature of sexuality and offered important insights into the human condition.

The book contains 12 chapters. The first introduces the basics of Darwin's theory of natural selection and what has been learned since Darwin about the physical basis of heredity. Chapter 2 introduces the fundamental concept of "fitness", measured as success at genetic replication. Chapter 3 introduces the idea of animals as "strategists", always working toward optimizing their fitness. In these last two chapters altruism and nepotism are discussed from the sociobiology standpoint – organisms help those who are most genetically similar in order to propagate their genes more effectively. Chapters 4 to 6 cover the central topics of sex and reproduction, the main theme of this book. Discussed are such issues as why sexual reproduction evolved (asexual reproduction was here first); how and why individuals compete for mates; and who chooses whom and why. Chapter 7 examines reproductive strategies from a comparative perspective (e. g., under what conditions do species evolve to be monogamous?) Chapter 8 examines reproductive strategy from a life-history perspective. Some animals (K-strategists) produce relatively few offspring. Such animals tend to live a long time, have relatively large brains and provide intensive nurturance to their offspring. Other animals (r-strategists) breed prolifically. Such animals tend to be short-lived, have relatively small brains, and provide little in the way of parental care. In other words, a whole syndrome of life-history characteristics evolved together, based on the sexual reproductive strategy the organism adopted. Chapters 9 and 10 discuss sex differences in reproductive strategy, and how sexual development and differentiation occur. It is here that an increasing focus on human sociobiology begins to emerge. Chapters 11 and 12 discuss human reproductive strategies in more detail and there is a welter of fascinating information provided (economically successful men traditionally accumulate multiple "wives" and replicate their genes more

frequently; males may be the more sexually jealous sex; women are often coerced by male cultural practices; women are “choosier” than men; world fertility patterns are changing in dramatic ways).

The book is written in an engaging and ebullient manner, aimed primarily as a textbook for undergraduate students in psychology and the social sciences. It is much more than this, however. It stands as a highly accessible guide and reference manual to current research and theory for psychologists interested in interfacing with evolutionary biology, as well as being “a good read” for any reasonably intelligent, literate person. It is very unusual for a book to so usefully serve such a wide audience. The authors have a quite remarkable capacity to “bottom line” knotty theories and complicated data sets.

There are very few criticisms that can be made and most of these will be idiosyncratic to the particular reviewer. However, I suspect that three may occur to those psychologists considering offering courses on human sociobiology. First, the book is highly focused on sex and reproduction and, therefore, does not cover other important topics in the degree of detail that course instructors may have wished: altruism and aggression, to mention two. Second, an even greater emphasis on the human species would have been preferred by most behavioural scientists (particularly students). Of course, this differential emphasis partly reflects the sheer amount of data available: we know more about some aspects of the sociobiology of the social insects, birds, and even dandelions than about ourselves! Finally, and allied to the last two criticisms, more information could have been incorporated from social-personality-developmental psychology. Instead, a mildly deprecating tone is occasionally adopted. For example, in the sections on human attraction and mate selection, in which there is a vast literature in both the social-personality and behaviour-genetic traditions, Daly and Wilson dismiss it as “fictitious . . . too artificial to be evaluated with much confidence” (P.304). Similar omissions occur elsewhere, for example in the area of human sex differences, and the even broader issue of individual differences in behaviour, which an evolutionary perspective requires there be a genetic basis to (Rushton, Russell & Wells, 1985).

Despite such minor carpings (and it is always easy to criticize a book for what it *didn't* include), the book is highly recommended for anyone interested in the current status of research in sociobiology. It would make an excellent textbook for anyone teaching a half year introductory course on sociobiology. Indeed, it would be fun to teach from. Moreover, it is light years ahead of most glossy textbooks on “Human Sexuality” where one would sometimes be hard-pressed to find evidence that sex had anything at all to do with evolution, genetic replication, or, even, biology! It will be of interest to see how much further advanced our knowledge is when the 3rd and 4th editions of Daly's and Wilson's admirable book become available in this rapidly expanding field of enquiry.

## REFERENCES

- Dawkins, R. (1976). *The selfish gene*. Oxford: Oxford University Press.
- Hull, D.L. (1978). Scientific bandwagon or travelling medicine show? In M.S. Gregory, A. Silvers & D. Sutch (Eds.), *Sociobiology and human nature*. San Francisco: Jossey-Bass.
- Ruse, M. (1979). *Sociobiology: Sense or nonsense?* Dordrecht, Holland: D. Reidel.
- Rushton, J.P., Russell, R.J.H. & Wells, P.A. (1985). Personality and genetic similarity theory. *Journal of Social and Biological Structures*, 8, 63–86.
- Wilson, E.O. (1975). *Sociobiology: The new synthesis*. Cambridge, Mass.: Harvard University Press.

The evolution of sexual reproduction describes how sexually reproducing animals, plants, fungi and protists could have evolved from a common ancestor that was a single celled eukaryotic species. There are a few species which have secondarily lost the ability to reproduce sexually, such as Bdelloidea, and some plants and animals that routinely reproduce asexually (by apomixis and parthenogenesis) without entirely losing sex. The evolution of sex contains two related yet distinct themes: its origin and How much of your behavior is ruled by sexual evolution?, February 7, 2001. I read this book in a college class. Mind you, I didn't read most of my college books, but I couldn't put this one down. It gives a clear, intelligent, remarkably well-documented, fascinating description of how sex evolved and how that evolution effects the behavior of everything from bacteria to modern social humans. This book is very accessible to any reasonably educated reader, regardless of your knowledge of evolutionary biology. And each idea is punctuated with a fascinating example taken from nature. Why do lightn