



## **SOCIOBIOLOGY**

**C. George Boeree**

---

Ever since Darwin came out with his theory of evolution, people - including Darwin himself -- have been speculating on how our social behaviors (and feelings, attitudes, and so on) might also be affected by evolution. After all, if the way our bodies look and work as biological creatures can be better understood through evolution, why not the things we do with those bodies?

The entomologist E. O Wilson was the first to formalize the idea that social behavior could be explained evolutionarily, and he called his theory sociobiology. At first, it gained attention only in biological circles -- even there it had strong critics. When sociologists and psychologists caught wind of it, the controversy really got started. At that time, sociology was predominantly structural-functionalist, with a smattering of Marxists and feminists. Psychology was still dominated by behaviorist learning theory, with humanism starting to make some headway. Not one of these theories has much room for the idea that we, as human beings, could be so strongly determined by evolutionary biology!

Over time, Wilson's sociobiology found more and more supporters among biologists, psychologists, and even anthropologists. Only sociology has remained relatively unaffected.

**Instinct**

Let's begin with an example of instinctual behavior in animals: The **three-spined stickleback** is a one-inch long fish that one can find in the rivers and lakes of Europe. Springtime is, as you might expect, the mating season for the mighty stickleback and the perfect time to see instincts in action.

Certain changes occur in their appearances: The male, normally dull, becomes red above the midline. He stakes out a territory for himself, from which he will chase any similarly colored male, and builds a nest by depositing weeds in a small hollow and running through them repeatedly to make a tunnel. This is all quite built-in. Males raised all alone will do the same. We find, in fact, that the male stickleback will, in the mating season, attempt to chase anything red from his territory (including the reflection of a red truck on the aquarium's glass).

But that's not the instinct of the moment. The female undergoes a transformation as well: She, normally dull like the male, becomes bloated by her many eggs and takes on a certain silvery glow that apparently no male stickleback can resist. When he sees a female, he will swim towards her in a zigzag pattern. She will respond by swimming towards him with her head held high. He responds by dashing towards his nest and indicating its entrance. She enters the nest, her head sticking out one end, her tail the other. He prods at the base of her tail with rhythmic thrusts. She releases her eggs and leaves the nest. He enters and fertilizes the eggs, and then, a thorough chauvinist, chases her away and waits for a new partner.

What you see working here is a series of **sign stimuli** and **fixed actions**: His zigzag dance is a response to her appearance and becomes a stimulus for her to follow, and so on. Perhaps I'm being perverse, but doesn't the stickleback's instinctive courtship remind you of some of our human courtship rituals? I'm not trying to say we are quite as mindless about it as the stickleback seems to be -- just that some similar patterns may form a part of or basis for our more complex, learned behaviors.

**Ethologists** -- people who study animal behavior in natural settings -- have been studying behaviors such as the sticklebacks' for over a century. One, Konrad Lorenz, has developed an hydraulic model of how an instinct works. We have a certain amount of energy available for any specific instinctual system, as illustrated by a reservoir of water. There is a presumably neurological mechanism that allows the release of some or all of that energy in the presence of the appropriate sign stimulus: a faucet. There are further

mechanisms -- neurological, motor, hormonal -- that translate the energy into specific fixed actions. Today, we might suggest that hydraulic energy is a poor metaphor and translate the whole system into an information processing one -- each era has its favorite metaphors. But the description still seems sound.

Does any of this apply to human courtship and sexual behavior? I leave it up to you. But what about other examples? Two possibilities stand out:

1. There are certain patterns of behavior found in most, if not all, animals, involving the promotion of oneself, the search for status or raw power, epitomized in aggression. Let's call this **the assertive instinct**.
2. There are other patterns of behavior found in, it seems, somewhat fewer species, involving care for someone other than oneself, epitomized in a mother's care for her babies. Let's call this the **nurturant instinct**.

## **Evolution**

The basics of evolution are quite simple. First, all animals tend to over-reproduce, some having literally thousands of offspring in a lifetime. Yet populations of animals tend to remain quite stable over the generations. Obviously, some of these offspring aren't making it!

Second, There is quite a bit of variation within any species. Much of the variety is genetically based and passed on from one generation to another. Included in that variety are traits that help some individuals to survive and reproduce, and other traits that hinder them.

Put the two ideas together, and you have **natural selection**: Nature encourages the propagation of the positive traits and discourages the negative ones. As long as variety continues to be created by sexual recombination and mutation, and the resources for life remain limited, evolution will continue.

One sociobiologist, David Barash, suggests a guiding question for understanding possible evolutionary roots of any behavior: "Why is sugar sweet", that is, why do we find it attractive? One hypothesis is that our ancestors ate fruit to meet their nutritional needs. Fruit is most nutritious when it is ripe. When fruit is ripe, it is loaded with sugars. Any ancestor who had a taste for sugar would be a little more likely to eat ripe fruit. His or her resulting good health would make him or her stronger and more attractive to potential mates. He or she might leave more offspring who, inheriting this

taste for ripe fruit, would be more likely to survive to reproductive age, etc. A more general form of the guiding question is to ask of any motivated behavior "How might that behavior have aided ancestral survival and/or reproduction?"

A curious point to make about the example used is that today we have refined sugar -- something which was not available to our ancestors, but which we discovered and passed on to our descendants through learned culture. It is clear that today a great attraction to sugar no longer serves our survival and reproduction. But culture moves much more quickly than evolution: It took millions of years to evolve our healthy taste for sugar; it took only thousands of years to undermine it.

### **Attraction**

Let's start by looking at mate selection. It is obvious that we are attracted some people more than others. Sociobiologists have the same explanation for this as for everything else, based on the archetypal question "why is sugar sweet?" We should be sexually attracted to others whose characteristics would maximize our genetic success, that is, would give us many healthy, long-lived, fertile children.

We should find healthiness attractive and, conversely, illness unattractive. We should find "perfect" features attractive, and deformities unattractive. We should find vitality, strength, vigor attractive. We should find "averageness" attractive -- not too short, not too tall, not too fat, not too thin.... Quasimodo, for all his decency, had a hard time getting dates.

We are also attracted to certain people for less "logical" reasons, such as the degree to which they have strong masculine or feminine physical -- and behavioral -- characteristics. Women prefer men who are taller, with broad shoulders, a square jaw.... Men prefer women who are shorter than themselves, softer, rounder....

These differences between the sexes is known as **sexual dimorphism**, and the process that leads to these differences is called **sexual selection**. Small functional differences between the sexes can become large nonfunctional ones over many generations. If female birds are instinctively inclined to prefer colorful males -- perhaps because colorful males have served to distract predators from ancestral females and their chicks -- then a male that is more colorful will have a better chance, and the female with a more intense

attraction to color a better chance, and their offspring will inherit their colors and intense attraction to colors and so on and so on... until you reach a point where the colors and the attraction are no longer a plus, but become a minus, such as in the birds of paradise. Some males cannot even fly under the weight of all their plumage.

Human beings are only modestly dimorphic. But boy are we aware of the dimorphisms!

The dimorphism is also found in our behaviors. David Barash puts it so: "Males tend to be selected for salesmanship; females for sales resistance." Females have a great deal invested in any act of copulation: the limited number of offspring she can carry, the dangers of pregnancy and childbirth, the increased nutritional requirements, the danger from predators...all serve to make the choice of a mate an important consideration. Males, on the other hand, can and do walk away from the consequences of copulation. Note, for example, the tendency of male frogs to try to mate with wading boots: As long as some sperm gets to where it should, the male is doing alright.

So females tend to be more fussy about who they have relations with. They are more sensitive to indications that a particular male will contribute to their genetic survival. One of the most obvious examples is the attention many female animals pay to the size and strength of males, and the development of specialized contests, such as those of antlered and horned animals, to demonstrate that strength.

There are less obvious things as well. In some animals, males have to show, not just strength, but the ability to provide. This is especially true in any species which has the male providing for the female during her pregnancy and lactation -- like humans! Sociobiologists suggest that, while men find youth and physical form most attractive, women tend to look for indications of success, solvency, savoir-faire. It might not just be a cultural fluke that men bring flowers and candies, pay for dinner, and so forth.

Further, they suggest, women may find themselves more interested in the "mature" man, as he is more likely to have proven himself, and less interested in the "immature" man, who presents a certain risk. And women should be more likely to put up with polygyny (i.e. other wives) than men with polyandry (other husbands): Sharing a clearly successful man is better in some cases than having a failure all to yourself. And, lo and behold, polygyny is even more

common than monogamy, while polyandry is found in perhaps two cultures (one in Tibet and the other in Africa), and in both it involves brothers "sharing" a wife in order not to break-up tiny inherited properties..

Taking it from the other direction, males will tolerate less infidelity than females: Females "know" their children are theirs; males never know for sure. Genetically, it matters less if males "sow wild oats" or have many mates or are unfaithful. And, sure enough, most cultures are harder on women than men when it comes to adultery. In most cultures, in fact, it is the woman who moves into the husband's family (virilocality) -- as if to keep track of her comings and goings.

From our culture's romantic view of love and marriage, it is interesting to note that in most cultures a failure to consummate a marriage is grounds for divorce or annulment. In our own culture, infertility and impotence are frequent causes of divorce. It seems reproduction is more important than we like to admit.

Of course, there is a limit to the extent to which we generalize from animals to humans (or from any species to any other), and this is especially true regarding sex. We are very sexy animals: Most animals restrict their sexual activity to narrowly defined periods of time, while we have sex all month and all year round. We can only guess how we got to be this way. Perhaps it has to do with the long-term helplessness of our infants. What better way to keep a family together than to make it so very reinforcing!

## **Children**

That brings us to children, our attraction to them, and their attraction to us. Adults of many species, including ours, seem to find small representatives of their species, with short arms and legs, large heads, flat faces, and big, round eyes... "cute" somehow -- "sweet," the sociobiologist might point out. It does make considerable evolutionary sense that, in animals with relatively helpless young, the adults should be attracted to their infants.

The infants, in turn, seem to be attracted to certain things as well. Goslings, as everyone knows, become attached to the first large moving object they come across in the first two days of life -- usually mother goose (occasionally Konrad Lorenz or other ethologists). This is called **imprinting**. Human infants respond to pairs of eyes, female voices, and touch.

The goslings respond to their sign-stimulus with **the following response**, literally following that large moving object. Human infants, of course, are incapable of following, so they resort to subterfuge: the broad, full bodied, toothless smile which parents find overwhelmingly attractive.

Sociobiologists go on to predict that mothers will care for their children more than fathers (they have more invested in them, and are more certain of their maternity); that older mothers will care more than younger mothers (they have fewer chances of further procreation); that we will be more solicitous of our children when we have few (or only one!) than when we have many; that we will increase our concern for our children as they get older (they have demonstrated their survival potential); and that we will tend to push our children into marriage and children of their own.

## **Helping**

Care -- helping behavior -- is likely when it involves our children, parents, spouses, or other close relations. It is less and less likely when it involves cousins or unrelated neighbors. It is so unusual when it involves strangers or distant people of other cultures and races that we recall one story -- the good Samaritan -- nearly 2000 years after the fact.

Sociobiologists predict that helping decreases with kinship distance. In fact, it should occur only when the sacrifice you make is outweighed by the advantage that sacrifice provides the genes you share with those relations. The geneticist J. B. S. Haldane supposedly once put it this way: "I'd gladly give my life for three of my brothers, five of my nephews, nine of my cousins...." This is called **kin selection**. Altruism based on genetic selfishness!

One kind of "altruistic" behavior is **herd behavior**. Some animals just seem to want to be close, and in dangerous times closer still. It makes sense: By collecting in a herd, you are less likely to be attacked by a predator. Mind you, sometimes you may find yourself on the outside of the herd -- but the odds are good that the next time you'll be snugly inside.

Another kind is called **reciprocal altruism**. A prairie dog who sees a predator will begin to yelp loudly, for example. This warns the rest of his community, although it draws the predators attention to the one doing the yelping!

Herd behavior and reciprocal altruism work for the same reason that kin selection works: It caters to **inclusive fitness**: A slight reduction of my own

survival probabilities is more than balanced by the survival of relatively close relations. Some animals even help any member of their own species, with the instinctual "understanding" that they may be the beneficiaries the next time they need help themselves.

Robert Trivers has suggested that people engage in a more sophisticated form of reciprocal altruism, shared only with a few of the more advanced creatures of the world. Here you would be willing to sacrifice for someone else if it is understood that that specific other will do the same for you, or reciprocate in some other way, "tit for tat." Clearly, this requires the ability to recognize individuals and to recall debts!

Other geneticists have pointed out that, if there is a genetic basis for reciprocal altruism, there will also be some individuals that **cheat** by allowing others to do for them without ever meeting their own obligations. In fact, depending on the advantages that reciprocal altruism provides and the tendency of altruists to get back at cheaters, cheaters will be found in any population. Other studies have shown that "sociopathy," guiltless ignoring of social norms, is found in a sizable portion of the human population.

There is, of course, no need for a human being to be 100% altruist or 100% cheat. Most of us (or is it all of us?), although we get angry at cheats, are quite capable of cheating when the occasion arises. We feel guilt, of course, but we can cheat. A large portion of the human psyche seems to be devoted to calculating our chances of success or failure at such shady maneuvers. More on this later.

## **Aggression**

Like many concepts in social psychology, aggression has many definitions, even many evaluations. Some think of aggression as a great virtue (e.g. "the aggressive businessperson"), while others see aggression as symptomatic of mental illness.

The fact that we do keep the same word anyway suggests that there is a commonality: Both positive and negative aggression serve to enhance the self. The positive version, which we could call assertiveness, is acting in a way that enhances the self, without the implication that we are hurting someone else. The negative version, which we might call violence, focuses more on the "disenhancement" of others as a means to the same end.



Although the life of animals often seems rather bloody, we must take care not to confuse **predation** -- the hunting and killing of other animals for food -- with aggression. Predation in carnivorous species has more in common with grazing in vegetarian species than with aggression between members of the same species. Take a good look at your neighborhood cat hunting a mouse: He is cool, composed, not hot and crazed. In human terms, there is not the usual emotional correlate of aggression: anger. He is simply taking care of business.

That taken care of, there remains remarkably little aggression in the animal world. But it does remain. We find it most often in circumstances of **competition** over a resource. This resource must be important for "fitness," that is, relevant to one's individual or reproductive success. Further, it must be restricted in abundance: Animals do not, for example, compete for air, but may for water, food, nesting areas, and mates.

It is the last item -- mates -- that accounts for most aggression in mammals. And it is males that are most noted for this aggression. As we mentioned earlier, females have so much at stake in any act of copulation -- so many months gestation, the increased energy requirement, susceptibility to attack, the dangers of birth, the responsibility of lactation -- that it serves their fitness to be "picky" when looking for a partner. If females are picky, males must be show-offs: The male must demonstrate that he has the qualities that serve the female's fitness, in order to serve his own fitness. Deer are a good example. Mind you, this need not be conscious or learned; in all likelihood, it is all quite instinctual in most mammals. It may possibly have some instinctual bases in us as well.

Some of his aggressiveness may in fact be mediated by **testosterone**, the "male" hormone. Inject testosterone into female mice and their threshold for aggressive behavior goes down. Remove testosterone from male mice (by castrating the poor things) and their thresholds go up. But I must add that testosterone does not cause aggression, it just lowers the threshold for it.

But females in many species can be quite aggressive (such as female guinea pigs), and females in any species can be extremely aggressive in certain circumstances (such as when facing a threat to her infants). In human societies, the sociological statistics are clear: Most violent crime is committed by men. But we have already noticed that, as women assert their rights to full participation in the social and economic world, those statistics are changing.

Time will tell the degree to which testosterone is responsible for aggression in people.

Nevertheless, males engage in a great deal of head-butting. But one can't help but notice that these contests "over" females seldom end in death or even serious injury in most species. That is because these contests are just that: contests. They are a matter of **displays** of virtues, and they usually include actions that serve as sign stimuli to the opponent that the contest has ended in his favor: **surrender signals**. Continued aggression is of little advantage to either the loser or the winner. Even male rattlesnakes don't bite each other!

**Territoriality** and **dominance hierarchies** -- once thought to be major focuses of aggressive behavior -- seem to be relatively less significant. Animals tend to respect territorial and status claims more than dispute them. It is only when circumstances, whether natural or humanly created, are out of the ordinary that we see much aggression. And low food supplies likely have little to do with aggression. Southwick, studying Rhesus monkeys in the London Zoo, found that reducing the food supplies by 25% had no effect on the amount of aggression found, and reducing the food supplies by 50% actually decreased aggression! We find the same thing among primitive people.

### **Aggression in Human Beings**

So why so much aggression in people? One possibility is our lack of biological restraints. Sociobiologists predict that animals that are poorly equipped for aggression are unlikely to have developed surrender signals. Man, they say, is one of these creatures. But we developed **technology**, including a technology of destruction, and this technology "evolved" much too quickly for our biological evolution to provide us with compensating restraints on aggression. Experience tells us that guns are more dangerous than knives, though both are efficient killing machines, because a gun is faster and provides us with less time to consider our act rationally -- the only restraint left us.

Another problem is that we humans live not just in the "real" world, but in a **symbolic** world as well. A lion gets aggressive about something here-and-now. People get aggressive about things that happened long ago, things that they think will happen some day in the future, or things that they've been told is happening. Likewise, a lion gets angry about pretty physical things. Calling him a name won't bother him a bit.

A lion gets angry about something that happens to him personally. We get angry about things that happen to our cars, our houses, our communities, our nations, our religious establishments, and so on. We have extended our "ego's" way beyond our selves and our loved ones to all sorts of symbolic things. The response to flag burning is only the latest example.

If aggression has an instinctual basis in human beings, we would expect there to be a sign stimulus. It would certainly not be something as simple as bright red males during mating season, as in stickleback fish. If we go back to the idea of competition as a fertile ground for aggression, we notice that **frustration** is a likely candidate. There are two of you who want the same thing; if one grabs it, the other doesn't get it and is unhappy; so he takes it, and now the other is unhappy; and so on. Goal-directed behavior has been blocked, and that is frustration.

Variations on that theme abound: We can be frustrated when an on-going behavior is interrupted (trying tripping someone); we can be frustrated by a delay of goal achievement (cut in front of someone on line at the supermarket); or we can be frustrated by the disruption of ordinary behavior patterns (cause me to forego my morning coffee). We are flexible creatures.

But we must beware here: Other things can lead to aggression besides frustration (or aren't highly paid boxers engaged in aggression?) and frustration can lead to other things besides aggression (or doesn't social impotence lead to depression?). Further, as Fromm points out, frustration (and aggression) is in the eyes of the beholder. He feels that the frustration must be experienced as unjust or as a sign of rejection for it to lead to aggression.

### **Sociobiology "versus" Culture**

Many psychologists, sociologist, anthropologists, and others are wary of the explanations -- convincing though they sometimes are -- of the sociobiologists: For every sociobiological explanation, we can find a cultural explanation as well. After all, culture operates by the same principles as evolution.

There are many different ways to do any one task, but in the context of a certain physical environment and a certain culture, some ways of doing things work better than others. These are more likely to be "passed on" from one generation to the next, this time by learning.

Now, cultures need to accomplish certain things if they are to survive at all. They must assure effective use of natural resources, for example, which might involve the learning of all sorts of territorial and aggressive behaviors, just like in sociobiological explanations. And they must assure a degree of cooperation, which might involve learning altruistic behaviors, rules for sharing resources and for other social relationships, just like the ones in sociobiological explanations. And they must assure a continuation of the population, which might involve certain courtship and marital arrangements, nurturant behaviors, and so on, just like in sociobiological explanations.

If a society is to survive -- and any existing society has at least survived until now -- it must take care of the very same issues that genetics must take care of. And, because learning is considerably more flexible than evolutionary adaptation, we would expect culture to tend to replace genetics. That is, after all, only evolutionary good sense!

So do we have instincts? If instincts are defined as automatic reflex-like connections -- no, probably not. But define instincts as "strong innate tendencies toward certain behaviors in certain situations" -- yes, we probably do. The important point is that we (unlike animals) can always say no to our instinctual behaviors, just like we can say no to our learned ones!

---

If you are interested in learning more about sociobiology and its impact on psychology, go to the [Center for Evolutionary Psychology](#). See especially their [Primer](#) for a more sophisticated overview of the topic!

Copyright 1998, C. George Boeree

[Return to my homepage](#)