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Sociobiology

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Sociobiology is the application of evolutionary theory to the study of social behavior (e.g., sexual or parental behavior) across animal taxa, including humans. Central to the field is the assertion that individuals and their behaviors are subject to natural selection. Therefore, just as evolution leads to useful physical traits emerging within and across species (e.g., camouflage, large brains), it also leads to the evolution of advantageous behaviors (e.g., seasonal migration, social learning). And because behaviors have evolved over time in a manner similar to physical traits, they are similarly inherited. Accordingly, behaviors that increase an individual's ability to survive and reproduce (i.e., maximize fitness) become more common in a population over time.

In the first overview of the field, E. O. Wilson presented *Sociobiology: The New Synthesis* (1975). In this book, he combined research programs from prominent evolutionary biologists including Richard Alexander (social behavior), Eric Charnov (foraging theory), William Hamilton (altruism), John Maynard Smith (kin selection), Robert Trivers (parental investment), and George Williams (mating systems) into a coherent discipline. Consequently, Wilson's work helped to focus research on the evolutionary processes behind social behaviors including altruism, aggression, parental care, and cooperation.

Sociobiological theory, primarily applied through field-based research, quickly proved a valuable framework from which to predict and interpret behavior. For example, Sarah Hrdy's pioneering research among Hanuman langurs challenged pathological views of infanticide (the killing of offspring). Dominant males control sexual access to females and exclude subordinate males from reproduction. However, on the occasion that a dominant male is supplanted, the previously subordinate male takes over the group of females and begins to kill infants. Previous research proposed overcrowding or maladaptive male aggressive tendencies as possible causal pathways. Hrdy, however, showed that infanticide by males was independent of population density and that the behavior specifically targeted infants that were unlikely to have been sired by the male himself. What infanticide did, Hrdy found, was cause females to quickly become fertile again. Because male tenure was often quite brief (~2 years), males have a very short window in which to reproduce. Therefore, those males that committed infanticide shortly after establishing sexual access to a group of females were most likely to reproduce successfully.

Although productive, the new field of sociobiology was not immune from criticism. In particular, many critics of sociobiology (e.g., Stephen Jay Gould and Richard Lewontin) linked the approach to biological determinism (i.e., the belief that differences in traits across individuals are driven primarily by genetic differences). They felt that an evolutionary approach to behavior reduced it to the level of instinct and thereby ignored fundamentally important features of the environment, individual experience, and—particularly for humans—social structure and culture. Of additional concern was that sociobiologists were offering tacit approval for certain behaviors deemed to be “natural” (e.g., infanticide) yet morally abhorrent.

Much of the backlash, according to many sociobiologists, was inappropriate. Sociobiological theory does not imply that social behavior is determined only by genes or that behavioral differences stem purely from genetic differences. Nor does it imply that a biological explanation justifies the behavior in question. Moreover, proponents distance themselves from the “nature versus nurture” debate that critics often support. Behavior is a product of the interaction between genes and the environment, with learning and individual experience guiding the acquisition of social and ecological information. Therefore, behavior has some biological basis but the specific behaviors that are practiced vary by context. Social learning

provides a useful illustration of this key point. Across animal taxa, the ability to learn is genetically determined; that is, there are evolved, biologically based predispositions to learning. However, among species that exhibit social learning, what individuals learn is not predetermined. For example, chimpanzees are heavily reliant on learning from caregivers and adult group members in order to acquire skills that range from how to efficiently process food to how to navigate social interactions. And what chimpanzees learn varies from population to population: In Senegal, they have been observed making wooden spears for hunting, in Guinea they use a moveable hammer and anvil to crack nuts, and in Zambia they perform what is known as a handclasp when grooming one another. This variation across populations in learned behaviors has been attributed to both ecological factors (e.g., the type and availability of foodstuffs across place favor different sorts of tools) and social conditions (e.g., cultural traits that guide appropriate behavior for individuals within a group).

When applied to humans, the most common sociobiological approach is known as human behavioral ecology (HBE). This field gives greater attention to an individual's social and ecological environment than does classical sociobiological theory. Central to HBE is the idea that humans have evolved the cognitive and physiological machinery to adaptively respond to environmental conditions. As such, HBE frames the study of behavior in terms of decision rules: In context, X do A and in context, Y do B, resulting in behavioral variation as individuals match their conditional strategies to their particular circumstances. Consequently, large differences in behavior among individuals can result from varying socioecological conditions with no correlated genetic differences. For example, economic migration is known to alter the demographic composition of populations across the globe. This resultant sex-ratio imbalance affects the availability of partners for marriage and alters patterns of family formation. Recent research among the Makushi of Guyana finds that in communities where men are relatively rare and potential sexual partners are in excess, male mating psychology orients toward short-term uncommitted relationships. However, where women are relatively rare, they become a valued resource, and men prefer and pursue long-term committed sexual relationships with a single partner. Thus, this example highlights expectations of behavior that are central to an HBE approach—our evolved, and quite flexible, cognitive machinery guides adaptive decision making and allows behavior to be responsive to contextual variation (i.e., environmental opportunities and constraints). Furthermore, HBE pays attention to human specific traits, such as culturally transmitted information that allows (or causes) individuals to adjust their behavior through imitation, social learning, and other processes.

Sociobiology has proven to be an important theoretical framework from which to evaluate social behavior. The field has been severely criticized since its inception, particularly due to concerns of biological determinism. In response, researchers have sought to clarify that their stance is that behavior arises from the interacting effects of genes, environment, and learning and to provide empirical support for an evolutionary approach to the study of social behavior. HBE has emerged as a productive application of sociobiological principles to the study of human behavior and has attempted to distance itself from criticisms of genetic reductionism by focusing on behavioral responsiveness to social and ecological conditions. In sum, sociobiology seeks to explain variation in behavior across individuals and populations from an evolutionary perspective and to challenge the simplistic labeling of behavior as due to either nature (i.e., biology) or nurture (i.e., context).

See also [Ethnocentrism](#); [Self-Categorization Theory](#); [Selfish Gene](#); [Similarity-Attraction](#); [Social Identity Theory](#)

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