

Appendix C

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Learning Objectives

- Define human behavioral ecology.
- Describe the types of behaviors that human behavioral ecologists study.
- Explain why humans share food.
- Identify how human behavioral ecology contributes to contemporary world issues.



Figure C.1 Aftermath of the 2004 Asian Tsunami in Sri Lanka.

On December 26, 2004, an earthquake in the Indian Ocean resulted in a tsunami that killed over 200,000 people in at least a dozen different countries (Editors of Encyclopaedia Britannica 2018; see Figure C.1). In the aftermath, 30% of American households donated an estimated \$2.78 billion to help the victims (The Center on Philanthropy at Indiana University 2008). At the same time, despite being one of the wealthiest countries in the world, the United States has over a million children who experience homelessness each year (National Center for Homeless Education 2017). Why is it that sometimes humans work together to help those in need, but at other times, humans struggle to solve basic problems? The field of Human Behavioral Ecology seeks to understand this

and many other questions to learn why humans behave the way they do. **Human Behavioral Ecology** is the field of anthropology that explores how evolutionary history and ecological factors combine to influence human behavior.

HUMAN BEHAVIORAL ECOLOGY

Evolutionary History

Natural selection is the force of evolution whereby individuals with heritable traits that result in greater survival and reproduction have more offspring than individuals without those traits. By having more offspring (specifically, offspring who themselves survive and reproduce), these heritable traits become more common in future generations. As an example, hominin brain size has increased dramatically over the past two million years. Our ancestors with larger brains were better able to survive and reproduce than those with smaller brains, possibly because they were better able to acquire food or navigate the social complexities of living in a large group (Dunbar 1998; Parker and Gibson 1979).

Human behavioral ecology uses the theory of evolution by natural selection to understand how modern behaviors were advantageous in our **evolutionary history**. For most of human history, humans lived as hunter-gatherers, meaning they collected or hunted food; they typically resided in small communities with individuals related through blood or marriage; and they had no access to modern medicines or other modern conveniences. It is useful to think about this environment—which is much different than how humans live today—to help us understand how current behaviors may have evolved. For example, humans today enjoy consuming food high in fats and sugars (see Chapter 16; see Figure C.2). In the past, eating fatty and sugary food was a good survival strategy since food was limited in a hunter-gatherer's environment, and these foods contained a lot of calories. Over time, those individuals who sought out these foods were probably better able to survive and reproduce, resulting in a population of people today who have preferences for these foods. In modern environments, where food is abundant, this preference has likely contributed to the obesity epidemic, which increases people's risk of cardiovascular diseases and no longer improves people's ability to survive and reproduce.



Figure C.2 Sample of sweets to celebrate Diwali, a Hindu festival of lights.

Ecology

In addition to evolutionary history, the field of human behavioral ecology also focuses on the influence of ecology. **Ecology** is defined as one's physical environment, including types of resources, predators, terrain, and weather, as well as one's social environment, including the behaviors of other individuals and cultural rules. For example, if one lives in an environment where there are abundant fruit trees, then one's diet likely includes fruit. Since fruits are easy to acquire, children can engage in food gathering at young ages. In contrast, in environments like the Arctic, where there are fewer plant resources, the diet focuses more on hunting and fishing. Since these skills take longer to acquire, children may only be able to contribute to their own subsistence at older ages. One's environment influences the behaviors in which individuals engage, such as children's foraging.

Another component of ecology is one's social environment, including cultural rules. Throughout the world, different cultures have quite different norms of behavior. For instance, in some societies marriages are required to be monogamous, meaning that a marriage is between just two individuals. This is a cultural norm in American society, and it is illegal to violate this rule. In other societies, marriages can occur between one man and several wives or one woman and several husbands, referred to as polygyny and polyandry respectively. If you are in a society where monogamy is the rule, then this will influence people's behavior, as each individual knows that they can only marry one other individual at a time. This may influence who they choose to be their partner. In polygynous cultures, the age difference between husbands and wives tends to be larger than it is in monogamous cultures, as the men who are able to attract additional wives tend to have high status or wealth and are typically older than the women who are available for marriage. One's environment (both physical and social) influences one's behavioral options, and human behavioral ecologists examine how one's ecology influences people's behavior. In Figure C.3, we see a visual depiction of the field of human behavioral ecology, using evolutionary history and ecology (physical environment plus culture) to explain modern human behavior.

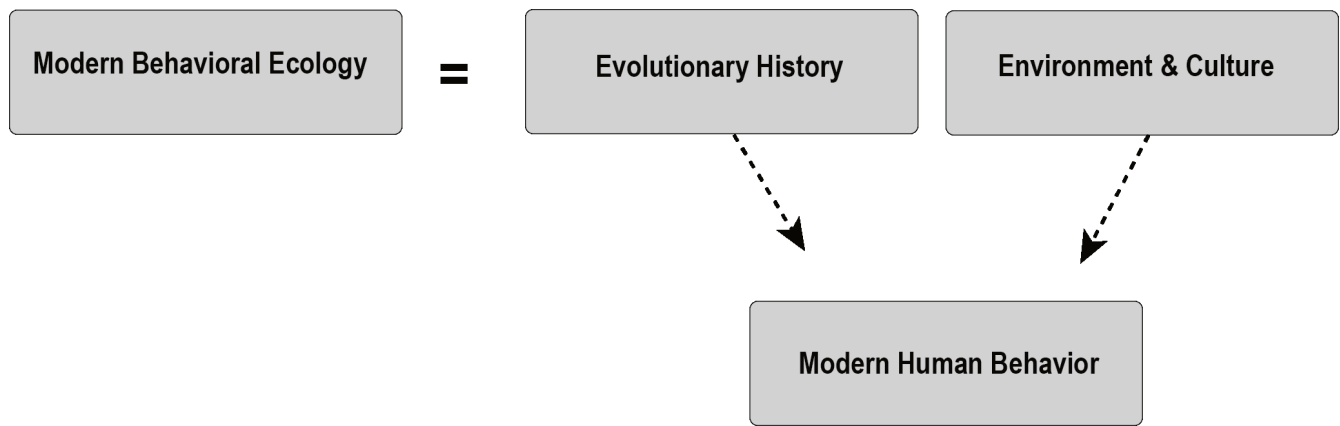


Figure C.3 Human behavioral ecology.

Both Genes and Environment Influence Behavior

While physical characteristics (like height) are clearly heritable, we also know that they depend on the environment. When children grow up with poor nutrition and do not ingest enough calories, their growth is stunted. At the same time, if your parents are both tall, then you are more likely to be tall as well. Physical traits are the result of both genes and environment. Behavior is the same—dependent on both genes and environment. While there are no genes for specific behaviors, behavioral tendencies do show some level of heritability. Personality disorders, for instance, may be partially heritable, but it also depends on the environment in which a child is raised—for example, where there is child neglect or sexual abuse, there is a corresponding increased risk of personality disorders (Johnson et al. 1999).

Human behavioral ecologists assume that even though there are not genes for specific behaviors, genes may influence behavioral tendencies. Additionally, behaviors are flexible and people use information from the environment to determine how they should behave. For example, the *ability* to cooperate has evolved over evolutionary time, but whether or not an individual cooperates in a particular instance likely depends on the situation. Research shows that people are more likely to cooperate if (1) their behavior is known to others (that is to say their identity is *not* anonymous), (2) it will improve their reputation, or (3) they will be punished for not cooperating (Andreoni and Petrie 2004; Fehr and Fischbacher 2003; Milinski, Semmann, and Krambeck 2002).

HOW CAN HUMAN BEHAVIORAL ECOLOGY HELP US UNDERSTAND ALTRUISM?

Altruism is defined as providing a benefit to someone without expecting anything in return. A perfect example is donating money to tsunami victims. From an evolutionary perspective, it seems that providing benefits to others would be disadvantageous for one's own survival and reproduction, as resources given to others are resources that cannot be used for oneself. But people do engage in altruistic behaviors, so how can the field of human behavioral ecology help us understand this behavior? We will use the example of food sharing to think about different ways human behavioral ecologists have examined this question. In many small-scale hunter-gatherer societies, people share food extensively with other people living in their communities. This sharing is most widespread when the item is a hunted animal, which

can typically feed many people. Just as giving away money seems counterintuitive, so does giving away food. So, why do people in these foraging communities share so much food with each other?

Kin Selection



Figure C.4 Lao family eating together.

One of the first explanations for why humans share food is that they are sharing with their close family members. **Kin selection** proposes that individuals help kin, even at a cost to themselves, because this help is directed at individuals with whom they share genes (Hamilton 1964). If we think of evolution from a *gene's eye view*, then individuals should care about passing on their genes. Since family members share genes, this may explain why kin help one another. Figure C.4 shows a Lao family eating together. It is very common around the world for families to share food with one another. In many small-scale societies, people share food with family members but also with those who are not family members. Kin selection helps explain some food sharing, but it doesn't explain all food sharing.

Reciprocal Altruism

Another potential explanation for why humans share food is that they are engaging in **reciprocal altruism**, meaning that an individual shares food today with the expectation of repayment at some point in the future (Trivers 1971). This can work well, unless the person who receives the help chooses not to reciprocate in the future. In this case, the original sharer does not obtain anything in return. To maintain these relationships, it is important that individuals have the opportunity to share with one another repeatedly and that if one person chooses not to reciprocate, the original sharer terminates their sharing. Reciprocal altruism is even more likely to occur if the value of the food is greater to the person receiving the food than the person sharing the food. For instance, imagine that you have an entire pizza. After you eat several slices, you are no longer hungry and the next piece of pizza has little value to you. In contrast, if you are hungry, receiving a slice of pizza from a friend would mean a lot to you. In this case, the person giving a piece of pizza after already eating their fill is giving away something of little value, but the person receiving a slice of pizza when they are hungry is receiving something with substantial value. If the following week, the roles are reversed, then in both cases, the person receiving the food has received something of greater value than has the person who gave it away. This makes sense in the case of sharing hunted meat as well. When hunters kill an animal, it is typically a large animal with a lot of meat. In environments without refrigeration technology, leftover meat has little value as it is likely to spoil. In contrast, sharing that meat with hungry community members has a lot of value to those receiving the meat. Then, at



Figure C.5 Jakun hunting party.

some point in the future, the person who received the meat may successfully hunt and share with others. Figure C.5 displays an indigenous hunting party from Malaysia. Food is widely shared in small-scale societies, particularly when the item is large in size and when there is a lot of uncertainty around when the next successful hunt will occur (Gurven 2004). But, as with other skilled activities, some individuals are better hunters than others and acquire more meat than others consistently, so why would highly skilled hunters give more food to low-skilled hunters than will be reciprocated? Again, reciprocal altruism is one piece of the story but cannot explain all sharing behavior.

The “Show-Off” Hypothesis

Another possible explanation for why people share food, particularly meat in small-scale societies, is because they want to display their skills as a hunter to their community, termed the **show-off hypothesis** (Hawkes 1991). As a social species, an individual's success relies on what others think of them. Providing resources to the community may help attract mates, friends, and allies. Those that share are likely to be viewed as good cooperators and worth having around. Among the Melanesian Meriam Islanders, evidence shows that turtle hunting during the breeding season, which is highly risky and unpredictable, is only done by unmarried males (Bliege Bird and Bird 1997). Turtle hunting during the nesting season, which is relatively easy and low risk, is done by males of all ages. This suggests that unmarried males engage in risky hunting to signal their skills as a hunter and cooperator. Again, while some sharing behavior may be best explained by a desire to *show off*, it cannot explain all sharing behavior.

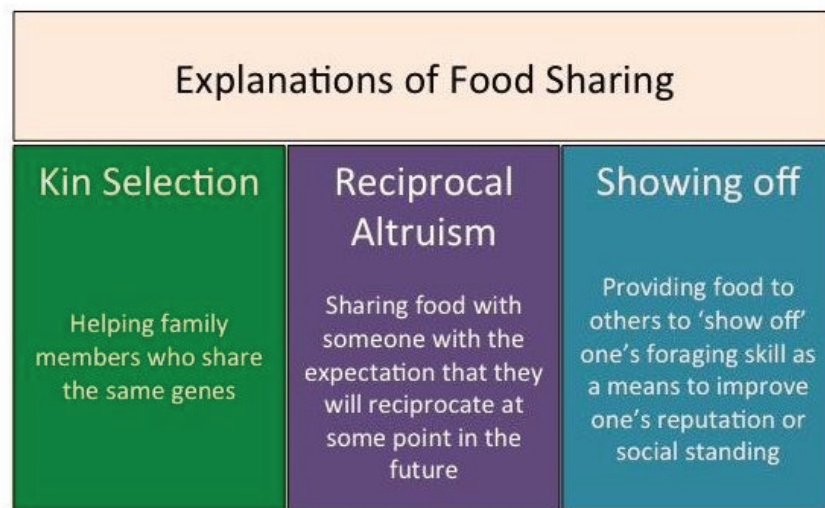


Figure C.6 Explanations of food sharing.

Examining these three explanations of sharing behavior (see Figure C.6)—kin selection, reciprocal altruism, and “showing off”—helps explain a lot of sharing seen around the world, but donating money to tsunami victims is still hard to understand. Most Americans were not related to the victims of the tsunami and they probably do not expect reciprocation. It is possible that people were doing it to *show off*, although it seems unlikely that many people used it as a means to improve their reputation. While some charitable giving may be explained by the tax incentives, the donations to the tsunami victims were so extensive that it seems unlikely to be the main explanation. People commonly state that they donate because “it makes them feel good.” While helping others does make people feel good, this likely evolved because those that had the feel-good sensation helped others—like their kin—resulting in greater survival and reproduction. The “feel good” sensation is a **proximate mechanism**, the immediate explanation, while human behavioral

ecology seeks to understand the **ultimate explanation**, or deep evolutionary reason that this trait led to increased survival and reproduction. In the case of donating money to people living on the other side of the world, our modern environment (allowing us to help people living so far away) may lead us to act in ways that were adaptive in our evolutionary past but that may not improve our survival or reproduction today.

At the same time, we struggle to solve the problem of homelessness across the United States. Using evolutionary theory may help us understand why people are unable to come together to eliminate this problem. Eradicating homelessness would be costly, would require the cooperation of lots of individuals (no single individual or small group can solve it on their own), and would be ongoing. This type of long-lasting commitment to help unrelated strangers may be difficult to acquire from large enough numbers of people to make an impact.

MAIN RESEARCH AREAS OF HUMAN BEHAVIORAL ECOLOGY

Throughout this appendix, we have been discussing one of the main research areas in Human Behavioral Ecology: cooperation and sharing. There are two other main areas of research for Human Behavioral Ecologists: production and reproduction. Production research explores how people acquire the resources that they need. Some research in this area has examined which items people choose to include in their diets and how long people spend foraging. This research has shown that people do not simply acquire any food resource in their environment; instead they make strategic decisions based on the food options available and the possible nutrients gained. Research on reproduction includes an examination of how people choose mates, make reproductive choices, invest in children, and acquire help to raise offspring. This line of research has shown that human mothers need help from others to raise offspring, and this help can come from a variety of sources, including the child's father, grandmothers, older siblings, grandfathers, or others (Hrdy 2009; Sear and Mace 2008). This is quite different from our non-human primate relatives, for whom almost all child care is given by mothers. These research areas capture many behaviors we faced in our evolutionary history: How did we get food, how did we distribute that food once we got it, and how did we make mating and reproductive decisions? All of the topics examined in the field of human behavioral ecology are closely linked to survival and reproduction inherent to evolution by natural selection and understanding how the environment influences decision making.

What Are the Common Misunderstandings about Human Behavioral Ecology?

There are a few common misperceptions about human behavioral ecology that make some people skeptical of this type of research. Some critiques have argued that studying the evolution of human behavior is problematic because of **biological determinism**, the idea that all behaviors are innate, determined by our genes. If behaviors are innate, then we cannot hold people accountable for their actions. But this is a misunderstanding. As mentioned previously, both genes and the environment influence behavior. Individuals may have a tendency to behave in a particular way, but behaviors are flexible. Also, there is no guarantee that everyone behaves in perfectly optimal ways. Over evolutionary time, those who acted more optimally in the past will have more offspring than those who did not, but in each generation we have variation in genotypes, phenotypes, and behaviors upon which selection can act.

Another common misconception is that by studying human behavior, human behavioral ecologists are providing justifications for those behaviors. The **naturalistic fallacy** describes the incorrect belief that what occurs in nature is what *ought to be*. This is a fallacy because it is absolutely *not* the goal of researchers in this field. For instance, some researchers study human violence. It is wrong to assume that by studying violence, the researchers believe that

violence is an acceptable behavior or is justifiable. It is easy to slip into this misconception. For instance, while studying mating behavior, researchers may try to understand why some people cheat on their partners. Understanding what environmental factors might increase the likelihood of cheating is *not* providing an excuse for the behavior.

HOW CAN HUMAN BEHAVIORAL ECOLOGY HELP US UNDERSTAND THE WORLD?

While it may seem that the field of human behavioral ecology is more concerned about our evolutionary past than our present, there are many contemporary issues that human behavioral ecology can help us solve. One area that human behavioral ecologists have focused on is reproductive decisions. Around the world, people are choosing to have fewer children than in the past. Some countries are still dealing with overpopulation, but an even larger number are dealing with population aging and depopulation. Understanding how people decide how many children to have is an important area of research in today's world (Colleran and Snopkowski 2018). Researchers have also used evolutionary theory to improve handwashing rates around the world (Curtis 2013), reduce the obesity epidemic (Pepper and Nettle 2014), reduce conflict (de Waal 2000), and improve cooperation (Boyd and Richerson 1992).

Review Questions

- Human behavioral ecologists focus on what two main factors as influencing behavior?
- What are the three main explanations for why people in small-scale societies share food extensively?
- Describe the environment that represents most of human history.
- What are two misconceptions about human behavioral ecology?
- What contemporary world issues can human behavioral ecology help us solve?

Key Terms

Altruism: Providing a benefit to someone else at a cost to oneself, without expecting future reciprocation.

Biological determinism: Behaviors are determined exclusively by genes.

Ecology: The physical and social environment, including food resources, predators, terrain, weather, social rules, behavior of other people, and cultural rules.

Evolutionary history: An understanding of how traits (including behaviors) may be the result of natural selection in our hominin past.

Human Behavioral Ecology: The field of anthropology that explores how ecological factors and evolutionary history combine to influence how humans behave.

Kin selection: A type of natural selection whereby people help relatives, which can evolve because people are helping other individuals with whom they share genes.

Naturalistic fallacy: The incorrect belief that what occurs is what ought to be.

Proximate explanation: The mechanism that is immediately responsible for an event.

Reciprocal altruism: Helping behavior that occurs because individuals expect that any help they provide will be reciprocated in the future.

Show-off hypothesis: Individuals provide benefits to others because it improves their reputation and social status.

Ultimate explanation: An explanation for an event that is further removed than a proximate explanation but that provides a greater insight or understanding. In human behavioral ecology, ultimate explanations usually describe how a behavior is linked to reproduction and survival.

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Kristin Snopkowski is a human behavioral ecologist and associate professor of anthropology at Boise State University. Her research examines reproductive decisions, including how many children people choose to have, how other family members influence those decisions, and the interaction between females and males in negotiating these decisions. She has conducted field work in Bolivia, interviewing women about their reproductive choices, and has been analyzing data sets from around the world to understand how environmental factors influence these decisions worldwide.

For Further Exploration

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Acknowledgments

Thanks to Sheryl Millard, Steven Menicucci, two anonymous reviewers, and the editors for helpful feedback on previous drafts of this section.

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