

Introduction to
Anthropology:
Holistic and Applied
Research on Being
Human

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MODULE 5: WHAT MAKES US HUMAN

What Makes Us Human?

Japanese macaques are Old World monkeys who are (in)famous for riding sika deer, uncannily like the way humans ride horses. The macaques ride deer for transportation and sometimes appear to ride just for fun. They've even been observed grooming the deer, but that's not the only human-like behavior they engage in. Some macaques humorously make and throw snowballs. Others have been observed washing potatoes in the water; a trait the adults pass down to the babies who watch them. And yet, others appear to luxuriate in hot-spring baths. These macaques have even been recorded policing a strict social hierarchy where only select members have access to the springs, while the rest eek it out in the cold; a behavior highly reminiscent of the "have and have nots" social structure typical of many human groups. However, they are not the only monkey to engage in such behaviors (see Figure 5.1).



Figure 5.1. Langur monkey riding deer (left) and Japanese macaques in a volcanic hot spring (right). Images from Flickr/Virji and Wikimedia Commons.

In Japan, macaques are something of a novelty and tourist attraction — watching monkeys who act like humans. But for anthropologists and other scientists, it begs a few questions: are behaviors such as riding deer and washing potatoes a sign of culture? How is macaque behavior different than human behavior? What do humans have in common with other primates? What makes humans unique among other primates?

In this chapter, we address the quintessential anthropological question, “What makes us human?” We’ll review a wide variety of intriguing primates, evaluate the case for culture among them, then compare humans to these other primates to ponder just what it is that makes humans different. Since we share nearly 99% of our DNA with our closest primate cousins—the chimpanzee—this difference is not as quantitatively large as you might think. Yet, we are of undeniably different since it is us writing and reading this chapter, and not the other way around. So, just what is the “little difference that makes the big difference” as NOVA asks in its 2008 documentary, *Ape Genius*.

What is “Human” Anyway?

Humans belong to the taxonomic order of **Primates**, which is a group of mammals including prosimians, monkeys, apes, and humans. Primates are associated with increased intelligence and cognitive abilities, as well as highly social natures, relative to other animals. Additionally, primates

are **unspecialized**. This means they are not highly adapted to a specific environmental niche or diet, such as a koala who only eats eucalyptus leaves, or panda bear who only eats bamboo. Unlike specialized animals with extraordinary smell (e.g., shark and bears) or sight (e.g., eagles and owls), primates have a reduced sense of smell due to a short rostrum, and most can't see well at night. Primates are also not particularly fast runners nor physically capable of flight. Finally, primates do not have natural defenses or offenses, such as sharp teeth, claws, wings, or fur.

Although primates are fairly unspecialized compared to other types of animals, they are distinguished by several common anatomical traits including the following:

- **pentadactylism** (i.e., five-fingers per limb)
- **fangernails** (i.e., instead of claws)
- **prehensile** (i.e., grasping) hands and feet
- dexterous hands with **opposable thumbs and/or big toes** (i.e., capable of being placed opposite forefinger)
- **heterodont dental patterning** (i.e., morphologically different types of teeth)
- **binocular vision** (i.e., two forward-facing eyes)
- **omnivorous diet** (i.e., eats both plant and animal foods)
- prolonged **postnatal dependency** (i.e., long childhood)
- relatively **large brains** compared to body size

Each species of primate exhibits some of the traits listed above. Few, if any, species exhibit all the “typical” primate traits. The differential development of these traits among species, combined with environmental adaptations, are used to understand how primates evolved and diversified over time (see hominin module). However, these generalist traits (combined with higher cognitive abilities), allow primates to adapt more easily to environmental or climatic changes. Primates can be found in the fossil record as far back as 55 million years ago, which dates to the Eocene Epoch. They are typically found in temperate or tropical regions of Africa, Asia, and South America. Today, there are more than 300 species of extant (i.e., still in existence) primates, making it one of the most diverse orders of

mammals.

Primates

The modern taxonomic classification system can be confusing for the layperson. To keep it simple, **primates** are in the Animal Kingdom, Mammal Class, and Primate Order. Figure 5.2. illustrates the breakdown of primates into further divisions. In this section, we describe examples of primate anatomy, social organization, and behavior among each of the major types of primates to determine what makes each group unique and whether culture is a phenomenon unique to humans alone.

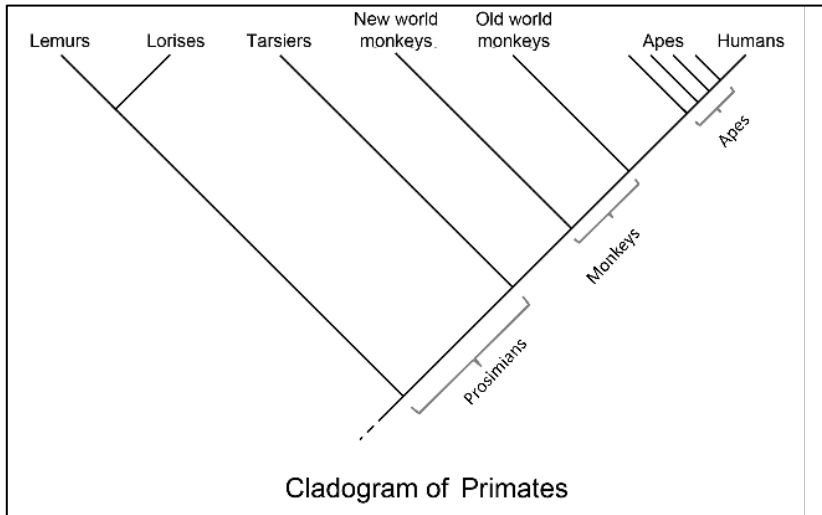


Figure 5.2. Simplified classification of prosimians, monkeys, apes and humans (right). Images modified from Wikimedia Commons.

Prosimians

Prosimians, which include lemurs and tarsiers, are the most primitive and mammal like of the primates. Found only in the tropical regions of Africa and Asia, many prosimians do not have forward-facing eyes like other primates, and they still have claws rather than fingernails. Because they are more mammal-like, they have longer rostrums and, therefore, a greater

reliance on smell than other primates. Also similar to mammals, they have more mobile ears, whiskers, and relatively fixed facial expressions compared to other primates. Prosimians are also well adapted to living in trees, or what anthropologists call an **arboreal** adaptation.

One of the better-known prosimians are **lemurs** (see Figure 5.3, left), which only live in Madagascar (a large island about 250 miles off the eastern coast of southern Africa in the Indian Ocean). About the size of a house cat, lemurs are nocturnal (i.e., forage at night) and spend much of their time in trees. They also walk on all fours, which makes them “arboreal quadrupeds.” Long tails, short legs, and curved fingers and toes give them exceptional balance and branch-grasping abilities and make them well-suited to live in trees. Lemurs are quite social and live in large groups led by dominant females. They mate and have offspring seasonally, and they communicate largely through scent markings and low growls.



Video 5.1. Check out the Nat Geo Wild video presenting a discussion of dominant females and mating among ring-tailed lemurs.

Generally lesser well-known than lemurs, **tarsiers** (see Figure 5.3, right), are only found in Southeast Asia, specifically, the forested islands of the Philippines, Malaysia, Indonesia, and Brunei. About the size of a large rat, tarsiers are more monkey-like than lemurs and exhibit some remarkable characteristics, including the ability to leap over ten feet, hear ultrasonic sounds well out of range of the human ear, and rotate their heads 180 degrees. Like lemurs, tarsiers are nocturnal (hence their very large eyes) and arboreal, but unlike lemurs, most tarsiers live solitary lives and come together twice seasonally to breed.



Figure 5.3. Lemur (left) and tarsier (right). Images from Wikimedia Commons.

Monkeys

While the Primate *order* includes prosimians as well as monkeys, apes, and humans, the suborder *Anthropoidea* includes just the latter three. Compared to prosimians, anthropoids have:

- generally larger body size,
- larger and more rounded braincases,
- flatter faces with relatively short snouts (i.e., no muzzles) and less reliance on the sense of smell,
- increased reliance on vision (including color vision) with forward-facing eyes, and
- eye orbits encased by a bony plate.



Video 5.2. Check out the Nat Geo Wild video that discusses tarsier behavior.

Monkeys, found on the continents of Africa, Asia, and South America, make up nearly 85% of all primate species. Biologists divide them into New- and Old-world monkeys based on dental traits (i.e., the presence of three premolars), prehensile (i.e., grasping) tails, and a primarily **insectivore diet** (i.e., versus the more generalized prosimians' omnivore diet).

New World Monkeys

Around 100 different species of New World monkeys are found in Central and South America. They are almost exclusively arboreal critters, who generally have **prehensile tails** which allow them to grab onto branches with their tail as well as their limbs. They also have an extra premolar, giving them three compared to the two that Old World monkeys and apes have. New World monkeys include tamarins and marmosets, capuchin and squirrel monkeys, and howler monkeys.

Marmosets and tamarins are the smallest and most primitive of the New World monkeys. Like prosimians, they have claws instead of fingernails, no opposable thumb or prehensile tail, and their facial expressions are relatively fixed. They communicate through chirps and twitters. Marmosets and tamarins are interesting socially in that males help carry babies and a second male often helps raise offspring; this may be a function of the fact that twin births are very common. Thus, while males and females begin as **monogamous** breeding pairs, they often become **polyandrous** over time, meaning that one female takes more than one male mate.



Video 5.3. Check out the Nat Geo Wild video discussing marmoset territorialism.

Yet not all New World monkeys are socially organized this way. For example, **howler monkeys**—so named for their specialized larynx which allows them to generate loud, menacing howls—are **polygynous**, meaning that one male mates with several females. Howler monkeys live in discrete mating groups (which help protect against predators), males herd and protect the group and females control the social aspects of the group, select mates,

and chase unrelated females. Finally, squirrel monkeys are perhaps the most social of the New World monkeys. They live in multi-male and multi-female groups of up to 500 individuals. These large groups, however, sometimes break into smaller troupes. These social groups have a variety of vocalizations which they use as warning sounds to protect the group from predators, such as falcons.



Figure 5.4. New World monkeys mentioned in text: marmoset (a), tamarin (b), howler monkey (c) and spider monkey (d). Modified from Microsoft Online Pictures.



Video 5.4. Check out the Nat Geo video discussing howler monkeys.

Old World Monkeys

Old-World monkeys, of which there are around 78 species, are found widely distributed throughout sub-Saharan Africa and southern Asia. They occupy

a wide range of habitats, from tropical jungles to semiarid deserts to seasonally snow-covered regions in northern Japan. Some of the more familiar monkeys that fall into this category are vervet monkeys and macaques, baboons, and rhesus and proboscis monkeys. Unlike the New World monkeys, they do not have prehensile tails, nor do they have the extra (i.e., third) premolar. They are also not exclusively arboreal but spend some or much of their time on the ground (what anthropologists call **terrestrial quadrupedialism**).

Because there are so many species of Old World monkeys, we'll focus on two. **Vervet monkeys** are small (approximately 6-10 pounds), black-faced monkeys common to southeastern Africa. Their mainly vegetarian diet is supplemented with insects, grubs, eggs, and sometimes baby birds and rodents. They live in fairly large social groups of up to 50 individuals which consist of both males and females. There is a strict social hierarchy among group members which controls access to feeding, mating, fighting, friendship, and grooming; the latter an important part of a vervet's life. They spend several hours each day removing parasites, dirt, and other materials from one another's fur. In the hierarchy, dominant individuals receive the most grooming. Males transfer troops at least once in their lifetime, beginning at puberty, which is a dangerous undertaking because of the predators they may encounter in transit and because troops generally dislike "immigrants." Vervets are well-known and often studied for their symbolic communication to warn each other of danger; an action that infants must be taught. They have three distinct alarm calls: one each for eagles (sky), pythons (land), and leopards (trees). While perhaps not quite meeting the definition of language, per se, the fact that each alarm call is distinct makes these sounds very similar to words (see Module 12: Communication and Language).



Video 5.5. Check out the BBC One's Talk video to the Animals on vervet monkey communication.

Macaques are found throughout Africa, southeast Asia, and northern Japan. Commonly used in medical research, macaques are well known and often studied for their complex social behavior, which is considered by many

anthropologists to reflect culture. As described at the opening of this chapter, Japanese macaques are famous for riding sika deer, making and throwing snowballs, taking (and clearly enjoying) hot baths, and washing potatoes. Macaques are highly social: they live in groups ranging in size from two dozen to several hundred individuals. A typical social group consists of 20-50 individuals of all ages and of both sexes; all macaque social groups are **matriarchal**, meaning that they are arranged around dominant females. As described at the beginning of this chapter, macaques have a very intricate social structure marked by dominance hierarchy and submission by lower ranking individuals. For example, if a macaque of a lower level in the social chain has eaten berries and none are left for a higher-ranking macaque, then the one higher in status can remove the berries from the other monkey's mouth. In another example, dominant females control access to hot springs, and male “bouncers” maintain this elite access. It is not uncommon for males to leave the group they grew up in, but importantly, if they do, they must begin at the bottom of the hierarchy in the new group.



Video 5.6. Check out the Discovery’s Life video on snow macaques in thermal spas.

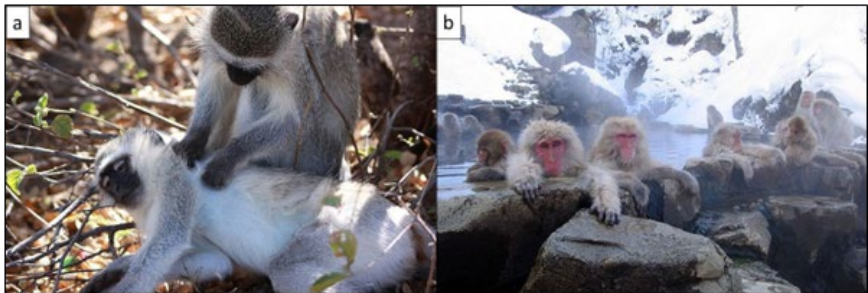


Figure 5.5. Old World monkeys mentioned in text: vervet monkeys grooming one another (a) and Japanese macaques enjoying bathing in hot springs (b). Images modified from Wikimedia Commons.

Apes

Apes and humans comprise the family *Hominidae*. Compared to other primates, these **hominoids** have the following physical and morphological characteristics:

- larger body size
- larger and more complex brains (particularly the cerebral cortex)
- absence of a tail
- shortened and more stable lumbar (i.e., trunk) area
- bipedal (versus quadrupedal only) capabilities
- **sexual dimorphism** (i.e., males are larger than females)
- increased postnatal dependency

In this section, we focus on apes, which are subdivided into what are called the **Greater** and **Lesser Apes** based on size. Neither group has tails, and both move through **brachiation**, which means they can swing their arms via their shoulders. The lesser apes include gibbons and siamangs, while the Great Apes include the more familiar gorillas, orangutans, and chimpanzees (and humans of course!).

Lesser Apes

Gibbons, and the closely related siamangs, are found in the southeastern tropical areas of Asia. They are the smallest of the apes, with long, slender bodies and weighing around 13-25 lbs. Images of gibbons frequently show them brachiating gracefully through the trees. Their long arms, flexible wrists, permanently curved fingers, and powerful shoulder muscles facilitate this movement. This specialized arboreal adaptation is likely related to their feeding behavior which consists of a variety of leaves, flowers, and insects eaten while hanging beneath branches. Gibbons live in small family groups



Video 5.7. Check out the Smithsonian Channel video discussing gibbons.

that are highly territorial, and they protect their territories with elaborate (and sometimes menacing) whoops and siren-like “songs.” Male-female mating pairs are generally **monogamous** (though researchers have sometimes documented them mating with other individuals) and form nuclear families with their dependent offspring. Like the marmosets and tamarins discussed earlier, males play an active role in childcare.

Great Apes

Today, **orangutans** are restricted to the heavily forested Indonesian islands of Sumatra and Borneo, though intensive logging and palm tree horticulture (for palm oil) is severely threatening their existence even there. Orangutans are almost exclusively arboreal, though they occasionally travel on the ground. Generally, they stay in heavily forested areas, using all four limbs as they slowly climb through the trees, looking for food. They are **frugivorous** (i.e., fruit-eating) but occasionally eat bark, leaves, or insects. Orangutans are large: males weigh in at 200 lbs. or more. Females, however, are notably smaller (~100 lbs.), which makes them one of the most **sexually dimorphic** Great apes, meaning that males are significantly larger than females. They live largely solitary lives, with adult females generally accompanied by one or two dependent offspring.

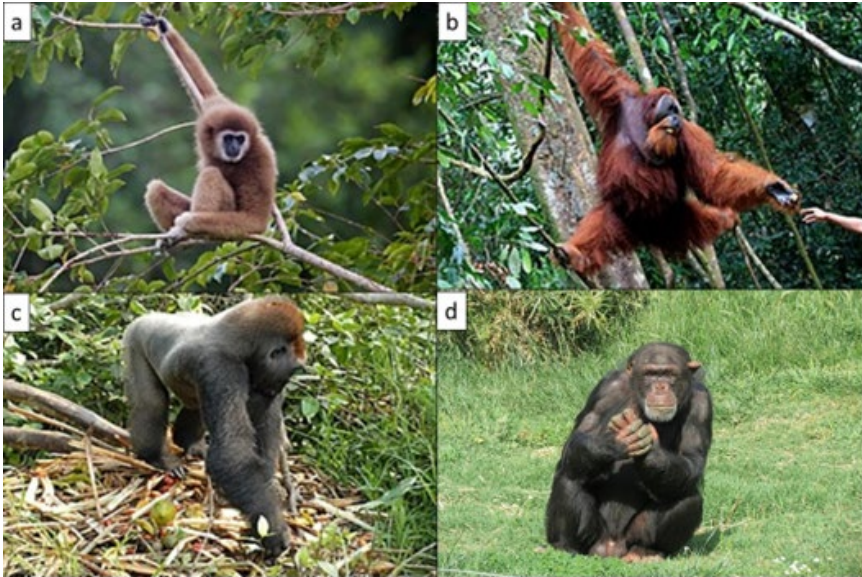


Figure 5.6. Great Apes mentioned in text: gibbon (a), orangutan (note brachiation) (b), gorilla (note knuckle-walking) (c) and chimpanzee (d). Images modified from Microsoft Online images.

Gorillas, the largest of the living apes, live in the equatorial lowland and mountain areas of western and eastern Africa. They are extremely sexually dimorphic with dominant males called silverbacks known to exceed 450 lbs., and females generally weigh 150-200 lbs.. Because of their weight, gorillas are terrestrial, meaning they spend their time on the ground. They use a **knuckle-walking** strategy to disperse their weight and support their large frame. Despite their huge size and ferocious reputation, gorillas are vegetarians that mostly eat leaves, pith and stalks, aquatic plants, and sometimes fruit. Their enormous facial bones support the large muscles necessary to process such fibrous foods.

Gorillas live in social groups dominated by one (and occasionally two) silverback males, a variable number of adult females and subadult (both dependent infant and less dependent juvenile) offspring. Not yet mature, subadult males are tolerated within the group until they become competitive, at which point they leave their **natal** (i.e., birth) **group** as young adult; they

may live alone for a while or join up with other males to form a new group. Females, too, often leave their natal group, but they join other existing groups.

Perhaps the most famous gorilla is Koko, a 300 lb. female who was taught American Sign Language (ASL) by researcher and caretaker Dr. Penny Patterson beginning in 1971. Over the next 40 years, Koko learned over 1,000 signs, reaching a roughly third-grade level of communication. According to Patterson, Koko could initiate conversations, sign to herself without being prompted, and could combine words into simple sentences with a rudimentary grammatical structure. For example, if Patterson pointed to a mirror and asked, “who is that?”, Koko signed in response: “Koko—gorilla—animal—Koko love.” Patterson’s lifelong care and teaching of Koko ignited the anthropological debate over whether primates can acquire language. Patterson argued that Koko was capable of communicating and also sharing experience and feelings. Other researchers, however, argue that Koko could only do this because she was taught, and that her language lacked the grammar and syntactical abilities of human language. Moreover, they point out that non-human animals cannot combine sounds into new combinations, nor apply known symbols to novel situations to communicate new, unlearned, meanings. Still, other researchers, however, are not so quick to rule out ape language. They criticize what they call an “anthropocentric” view of language, or the view that takes human language as the standard. Because apes do not have the physical ability to vocalize and form sounds made by humans (hence why Patterson taught Koko sign language), these critics argue that it is unfair to compare primate language to human language.



Video 5.8. Check out the Nat Geo video discussing Koko the Gorilla and her use of sign language.

Living in the forest regions of equatorial Africa, chimpanzees and bonobos are our closest living relatives genetically; indeed, they share 98.7% of DNA with humans. Anatomically, they are smaller than gorillas and orangutans as males weigh about 100 lbs., and females weigh about 80 lbs. Both chimpanzees and bonobos rely on quadruped knuckle-walking, though they may brachiate when in the trees, particularly, the youngsters. On the

ground, they often walk bipedally for short distances, especially, if they are carrying food or tools in their arms.

Both species are omnivores, and they eat an incredibly wide array of foods including fruit, berries, nuts, leaves, insects (termites and caterpillars are a favorite), birds, eggs, and small mammals such as bush babies. Both males and female chimpanzees also occasionally hunt in groups to kill larger mammals such as red colobus, young baboons, bush pigs, and even antelope. Both males and females hunt, and when the hunts are successful, group members share the prey. Hunting frequently entails group effort, cooperation, and toolmaking. For example, Jane Goodall was the first to observe chimpanzees modifying twigs to create a tool capable of pushing into the ground to fish ants or into termite mounds. More recently, anthropologist Jill Pruetz and psychologist Andrew Whiten discovered a group of chimpanzees in Fongoli, Senegal, modifying the ends of branches into sharp spear points which they would jab into tree cavities to spear bush babies.



Video 5.9. Check out the BBC Reel video discussing chimpanzee behaviors.

Chimpanzee and bonobo social behavior is complex, and individuals form lifelong attachments with family members and friends. Mothers and their offspring often remain attached throughout their lives, which extends into the mid-30s and 40s. Both species are also highly social with patterned behaviors and evidence of kinship practices. They live in communities of about 50 members. Male chimpanzees, who are sometimes competitive amongst themselves, defend the group's territory, especially from unfamiliar male chimpanzees from outside of the group; all outsiders are considered strangers and viewed with suspicion. Among chimpanzees, males do not leave the natal group, though females may join another community or leave the natal group temporarily when in estrus; it is thought that this behavior reduces the chances of mating with close male relatives. Adult females generally forage alone or with dependent offspring (infants) and juveniles who help care for the infants.

Interestingly, unlike male-dominated chimp culture, it is the females that dominate bonobo communities. In these matriarchal societies, female alliances are strong, and they gang up on males who step out of line, and strangers are welcomed in the group rather than considered outsiders like among chimps. Bonobos are the only great ape species to exhibit a matriarchal community structure, and interestingly, they are also the only primate species that does not experience intra-species violence—namely, homicide and genocide. This may be related to bonobo sexuality which differs from other primates in that sex is very frequent, occurring throughout a female cycle (rather than only when in estrus), and commonly accompanies most social interactions. In fact, the practice is so widespread (and occurs between same-sex individuals as regularly as opposite sex, as well as between different age groups), that anthropologists Vanessa Woods and Brian Hare have dubbed sex the “bonobo handshake.” They posit that, while such behavior may seem odd to us or even humorous, it is a valuable mechanism that diffuses tension and allows them to live peacefully and non-violently. Further, they are the only primate species that can claim this achievement.



Video 5.10. Check out the Nat Geo video discussing bonobos behavior.

Humans

The rest of this book is, of course, about humans. So, there is little need to describe us in the same detail we have described the other primates above. Three points, however, are worth reiterating. First, unlike all other primates, there is only one living species of *Homo sapiens sapiens*. For example: there are eight species of gibbons and 78 species of Old-World monkeys, but humans are all by ourselves. This begs the question: “how did this come to be?” Second, human beings exhibit an incredibly diverse range of physical characteristics which reflect evolved adaptations to particular environments. This also raises the question of what created such great phenotypic (physical) variation, yet, so surprisingly little genetic variation?

Finally, and perhaps most importantly, while our primate heritage is evident in our overall anatomy and genetic makeup, we are almost entirely dependent on culture for our survival. Relative to other primates, we have reduced canine size, dependence on smell, and vision, but all other primates depend on these characteristics as predators. We can also still technically brachiate (think of kids swinging on monkey bars at the playground), however, we certainly don't depend on this ability to forage for food or escape from predators! Rather, it is culture that we depend on to procure food and create shelter. Without culture, we would have never left the tropical home of our ancestors, never inhabited every corner of the globe (and even stepped on the moon!), nor produced the vast literature, history, and oral traditions that comprise our lives. Moreover, human culture varies more than any of the species we've previously discussed — so much so that we could not begin to summarize it here. Humans live in groups ranging anywhere from 20 to millions of people; there are groups that exclusively hunt and gather wild foods while others exclusively farm domesticated plants and animals; some groups are monogamous, polygynous, and/or polyandrous; other groups are patriarchal and unequal, while others are more matriarchal and/or egalitarian. But regardless of how we organize our communities, we *all* share a number of traits generally considered uniquely humans including culture, toolmaking, self-awareness language, and pro-social behaviors. We'll visit these traits in more detail below and evaluate just how unique they really are. In the end, most of these will not suffice to define our human uniqueness, but it is the extent to which we engage with them in comparison to other primates that sets us apart.

So, What Makes Us Human?

Humans are extremely adept at using tools. From the first Acheulian hand axe to cellular and space technologies of today, tools are certainly a shining achievement of humanity. Prior to the 1960s, tools were generally considered the “gold-standard” of human uniqueness: humans, and only humans, used and made tools. But then, in 1960, a young researcher named Jane Goodall shocked the anthropological community with photographic footage of chimpanzees making tools. Dr. Goodall, who did not even have a B.A. degree at the time, had not set out to study tools or anything particular

at all; she simply wanted to record and observe chimpanzees in the wild. But one October morning, she serendipitously encountered a chimp that squatting on a termite mound. Stopping to see what he was doing, but not wanting to startle him, she sat some distance away and watched as he poked what appeared to be long pieces of grass into the mound then put them in his mouth. When he left, she approached the mound and inserted one of the abandoned grasses into a hole herself. To her surprise (and great delight), it was covered in termites; he had been using the stem as a tool to "fish" for insects. Goodall later observed other chimps in the community purposefully stripping leaves off twigs to create a smooth tool for inserting into the termite mounds. Importantly, this latter behavior represents not just the use of a tool, but *modification* of an object to make a tool—in other words: toolmaking. When the famous anthropologist Louis Leakey received Jane's telegram describing her discovery, he made his now famous response: "Now we must redefine tool, redefine Man, or accept chimpanzees as humans." Today, researchers have recorded numerous examples of chimps making and using tools in the wild and in captivity such as the bush baby spears recorded by Pruett and Whiten in Fongoli, modified termite extraction twigs, rocks to open nuts, and vines as play toys. You can watch some of these examples in the video clip below.



Video 5.11. Check out the Nat Geo video discussing chimpanzee tool use.

Language is used to convey information and share and transmit knowledge. But like gorillas, chimpanzees can learn human sign language. The most famous chimpanzee to learn language was Washoe, a female chimpanzee who, like Koko the gorilla, learned American Sign Language. By the age of five, Washoe could sign over 350 words, form simple sentences, and use a very simple grammar. While some researchers dismissed chimpanzee language as simply responding to human prompts, many others noted that, like Koko, Washoe would sometimes sign unprompted or use combinations of known signs to describe something unknown. For example, upon seeing a swan for the first time, Washoe signed "water" and "bird" to describe the creature. Many other chimps have been

language trained since Washoe, representing a trait that all great apes appear capable of learning to some degree. So, while humans clearly use language in more nuanced and sophisticated ways than other primates, the capacity for language alone cannot explain why humans are so unique among primates.

Given that language and toolmaking no longer seemed to be the smoking gun, researchers turned to a more esoteric explanation: self-awareness. The litmus test for self-awareness is responding to and recognizing your reflection in a mirror, something human babies can do by 2-years of age. Many species, such as cats and dogs, pass a mirror without looking, or think that the reflection is another real animal. However, some animals, such as elephants and primate, demonstrated that they were self-aware. The gold standard experiment for self-awareness is what researchers call the “**rouge test.**” The test involves putting a bit of lipstick or blush on an animal’s face, then putting them in front of a mirror to observe their reaction. Before 18 months of age, human babies show no signs of noticing the makeup; they smile at the baby in the mirror, delighting in watching the “other baby” mimic every little thing they do, but around 18-24 months, human babies begin to notice the makeup, and some even become distressed and try to rub it off instead of playing with the baby in the mirror. Recognizing oneself in a mirror is important to researchers because it demonstrates the ability to think about oneself as an independent being with thoughts that are separate and distinct from someone else’s — what psychologists call **theory of mind**. Theory of mind is the understanding that other people have thoughts and feelings that are separate from yours. It is what allows children to understand other people’s intentions and emotions, and is related to a variety of important prosocial behaviors like friendliness, sharing, helping, and even deceptive behaviors like lying. Few animals can pass the rouge test. Besides humans, the great apes and some monkeys, dolphins, orcas, and elephants can recognize themselves. Elephants are especially interesting because, in addition to noticing the rouge, elephants in the wild have been observed touching, rolling, and picking up the bones of deceased matriarchs, which suggests that they are capable of feeling sorrow, grief, and empathy, and understand the concept of death.



Video 5.12. Check out the Nat Geo video presenting elephants in mourning.

Culture. For several decades, it was believed that culture was only unique to humans since, from our human point of view, only we have passed down knowledge and customs from one generation to the next. But it was not long before evidence began mounting that other species engaged in behavior that looked like culture. Recall the description of macaque social hierarchy and the differential access to the thermal hot springs. Such behavior is learned by the youngsters and perpetuated into their own adulthood. Among chimpanzees, anthropologists were surprised to find that groups living in different regions engaged in culturally specific behaviors. For example, you could easily identify a chimpanzee from Fongoli because only Fongoli chimps enjoy dunking themselves in ponds (other chimps hate water) and making spears to kill bush babies.

Primatologist Robert Sapolsky has recorded a fascinating example of not only culture, but also cultural *change*, among the Forest Troop baboon group in Kenya. Normally, baboon culture is rife with violence; males constantly fight over access to females, food, resting spots, or for no apparent reason at all. The most serious altercations occur between baboons of close rank, but baboons low on the totem pole get bullied all the time by higher ranking individuals looking for an ego boost (sounds a bit familiar, no?). In 1986, an outbreak of tuberculosis killed off the most aggressive males. The death of so many prompted Sapolsky to abandon his study for ten years, but when he returned, a dramatic and unexpected change had taken place: troupe members now sat closer together and groomed each other more than they had previously, and higher-ranking baboons no longer violently vented their anger on subordinates. This appears to have improved life for lower ranking baboons who no longer had the markers of chronic stress (e.g., elevated levels of stress hormones). The most remarkable observation, however, was that the troop had apparently maintained the peace despite a complete turnover in the male population. Normally aggressive male adolescent baboons leave their native troop and slowly work into a new one, and the Forest Troop had

somehow managed to assimilate these surly newcomers without losing its peaceful culture. Sapolsky doesn't claim to know how this cultural shift is being passed on, but he suspects it has to do with the friendly attitude of female baboons towards newcomer males, as if the female baboons had "seen the light" so to speak and realized that life is better with peaceful males.

Despite such evidence, many scientists still contested the new data, and the culture hypothesis remained hotly debated for years. But views are beginning to change as more and more evidence becomes available. Even more recently, scientists have begun to realize that many non-primates have culture as well. These include the songs of Australian humpback whales, which appear to go through phases of popularity and decline, just like human pop music, and bottlenose dolphins of the Florida Keys who hunt communally by swimming in tight circles on the seabed and creating rings of billowing mud that confuse and trap fish (something that only this particular group of dolphins does). Additionally, crows and ravens have the ability to make and use tools and pass these designs and mental templates of useful objects to other, unrelated crows. The short video below goes into greater depth about some of these examples.



Video 5.13. Check out the video from The Atlantic discussing bizarre animal behavior.

Pro-social Behavior.

Since the early 2000s, the emerging consensus regarding a uniquely human trait focuses on what scientists call **pro-social behavior**. Pro-social behaviors include friendliness, altruism, an active and hands-on approach to teaching (as opposed to the trial-and-error-style learning that chimpanzees engage in), the desire to encourage others, and the ability to share goals. The 2008 NOVA documentary, *Ape Genius*, explores these pro-social behaviors through a series of creative experiments involving chimpanzees and human children. For example, something as simple as pointing is pro-social behavior. While we take it for granted, it is a complex skill that non-human primates do not have. Pointing involves directing someone's attention

towards a third object; you expect that other person to understand that your attention is on that object, and that you want them to attend to the same object so you can share in the same knowledge and/or goal with them. This creates a triangle between you, the other person, and the object. This triangle is critical for communication, teaching, and teamwork. As anthropologist Rebecca Saxe states in *Ape Genius*, “It’s a special cognitive achievement...kids do this naturally, almost immediately...[but] curiously, apes can’t get into that” (NOVA 2008).

Altruism. Behavior that benefits another individual while involving some risk or sacrifice to the performer, is another example of pro-social behavior. The most fundamental altruistic behavior — the protection of offspring — is ubiquitous among mammals and birds, but among primates, altruism often extends to individuals beyond close genetic relatives. For example, Stelzner and Strier recorded a female baboon chase a hyena that was in pursuit of a young adult male baboon that she was not related to, female langurs protect infants they’re not related to from infanticidal males, and chimpanzees will adopt orphans, though these infants are generally related to them. Among humans, altruism goes even further. Consider emergency responders such as those who were called to the World Trade towers on September 11, 2001. These individuals, of whom 412 died, did not consider their own safety before rushing in to save people they weren’t related to and had never met. This kind of altruism is endemic among first responders, military personal, but is also prevalent in the general population as well.

Summary

Anthropologists are humans who study what makes humans unique. Although many scientists strive for objectivity, our own inherent biases inevitably affect our studies and interpretations. We are studying ourselves, and therefore, objectivity or neutrality is often impossible. We typically treat humans as beings with agency and self-awareness that other animals lack. As a result, over the decades, our criteria for what makes humans unique has evolved and become more specific as we discover the breadth of diversity within primate communities. There are examples of

primates that use tools and complicated language, that have a sense of self, and demonstrate compassion, empathy, or altruism. We even find that other species (the closest being chimpanzees) who even have dark aggressive sides and engage in the same kinds of violent, genocidal behaviors that humans do. Thus, anthropology's goal post is constantly shifting as anthropologists try to explain why humans are more than "just another primate." Perhaps it is not so much a matter of identifying a single, all-encompassing trait that makes us unique, so much as it is exploring the extent to which humans differ in these traits. Obviously, the incentive to modify a twig to procure a snack of ants is quite different from the motivation to develop mobile phones, stockpile nuclear missiles, and land robots on the surface of Mars. Perhaps this, then, is the "little difference that makes all the difference."

Review Questions

- **T/F.** Primates have monocular vision, where vision fields do not overlap.
- **T/F.** Old world monkeys tend to have an extra premolar and a prehensile tail.
- **T/F.** Vervet monkeys use a symbolic communication system to alert their communities to predators.
- **T/F.** Chimpanzees tend to form male-dominated cultures, while bonobos tend to form female-dominated cultures.
- **T/F.** Humans can be distinguished from other primates by their prosocial tendencies, among other traits.

Discussion Questions

- Watch the BBC video clip (see insert above) on the Japanese macaques use of thermal hot springs. Watching this, do they seem to have similar social rankings and hierarchies like many human groups? Or do you feel they are different? If different, in what way(s)?
- Is it possible for humans to study ourselves objectively or neutrally? As noted in the chapter summary, the anthropology community's goal post is constantly shifting as we try to explain why humans are more than "just a primate." Is this the question we need to answer? Or is it not necessarily a matter of having unique traits, but instead the *extent* to which we develop these behaviors and traits?
- History demonstrates that humans can act in very contradictory ways. At one extreme, humans can do incomprehensibly evil things to each other: we commit murder and genocide in the name of race, religion, and all sorts of prejudices. This represents an aggressive side of humanity, which is also visible in chimpanzee populations. At the other extreme, humans have demonstrated the capacity for a tremendous amount of altruism. In the Navajo language, there is no word for charity, because there are expectations of generosity and sharing. Across cultures, people donate food and medicine to strangers, donate organs to unknown recipients, and care for others. These generous traits are more similar to the less aggressive bonobos. What can we learn about ourselves from studying bonobos and chimpanzees? Can any of these lessons help improve the quality of life for all humans across the globe?
- Do some research on the human-related activities threatening the survival of many of the great apes, such as urban development, timbering, mineral extraction, and the exotic pet trade. What can we do to help save non-human primates from extinction, and why is this even important to humanity? What can we learn from these species that might improve the quality of life for people today?

Activities

1. Google videos of Koko the gorilla and Washoe the chimpanzee (and Alex the parrot if you want to go beyond primates) and observe their use of language. Are they, as some argue, truly using language to convey information and share knowledge using vocabulary and a grammatical structure? Or are the animals simply responding to human cues and prompts? There's no right or wrong answer here—researchers debate this among themselves. What is your impression? Can you think of an experiment that could be conducted to help resolve this debate?
2. *Are you as smart as a 5-year-old bonobo?* (Many ways to approach this, e.g., from a video prompt (e.g., Woods video below) or schematic drawn on board.)
3. If you have one nearby, visit your local zoo and select one primate to observe firsthand. This can include any of the species mentioned in this text or any of the numerous other primates that exist in the world. Spend anywhere from 30–60 minutes with your observations. Note the time of day, weather, and other contextual information to frame your study. If there is no zoo nearby, this can be completed through internet research and videos. Describe the appearance, locomotion, and behaviors of the primates. How does this help you better understand some of our closest relatives? Do any of the behaviors seem human like? Do you think any of their behaviors can be attributed to culture? Explain your thoughts.

Key Terms

Altruism: Behavior that benefits another individual while involving some risk or sacrifice to the performer.

Anthropoid: A subgroup of primates that includes monkeys, apes, and humans.

Arboreal: Adapted to living in trees.

Binocular Vision: Stereoscopic sight due to forward facing eyes that allows for better depth perception.

Bipedal: A form of locomotion where individuals walk on two legs instead of four.

Brachiation: A form of locomotion where individuals swing their arms around their shoulder blade for full rotational movement.

Frugivorous: Animals that eat primarily fruits.

Great Apes: Large-sized hominoids including gorillas, chimpanzees, bonobos, orangutans, and humans.

Heterodont: Dental patterns where a species has multiple types of teeth in their mouth for different functions (i.e., incisors, canines, premolars, and molars). Contrast with homodont teeth found in animals such as reptiles.

Hominoid: A subgroup of primates including apes and humans.

Howler Monkey: A type of New World monkey with a specialized larynx.

Insectivore: Animals that eat primarily insects.

Knuckle-walking: A form of quadruped locomotion where the forelimbs are partially flexed, and weight is put on the knuckles. This is common in gorillas and chimpanzees.

Lemur: A prosimian with more primitive and mammal-like habits than other primates.

Lesser Apes: Small-sized hominoids including gibbons and siamangs.

Macaque: A type of Old World monkey known for pro-social behaviors.

Marmoset: A type of New World monkey that is small and lacking a prehensile tail.

Matriarchal: A form of social organization arranged around dominant females.

Monogamous: A mating behavior where individuals each have only one sexual partner.

Omnivore: Animals with diverse diets that eat both plants and animals.

Opposable thumb: A finger that can touch other fingers, giving animals the ability to hold, precisely grip, and manipulate objects.

Pentadactylism: Having five fingers per limb.

Polyandrous: A mating behavior where female individuals mate with multiple males within a single breeding season.

Polygynous: A mating behavior where male individuals mate with multiple females within a single breeding season.

Prehensile tail: An adaptation allowing an individual to grasp or hold something with their tail, similar to the opposable thumb.

Primate: An order of mammals including prosimians, monkeys, apes, and humans.

Prosimian: A primitive subgroup of primates including lemurs, lorises, and tarsiers.

Pro-social Behavior: A complex skillset that is critical for communication and teamwork, including tendencies such as friendliness, altruism, an active, hands-on approach to teaching, the desire to encourage others, and the ability to share goals.

Rostrum: An anterior projection on the face, resulting in a prolonged or elongated mouth and/or nose.

Rouge test: A test used to assess an animal's self-awareness and theory of mind.

Sexually dimorphic: Sex-based differences in size within a species.

Tarsier: A type of prosimian with elongated ankle bones that is known for leaping locomotion patterns.

Terrestrial quadrupedialism: A type of locomotion where all four limbs are used for walking on solid ground surfaces (not in trees).

Theory of Mind: Understanding that other people have thoughts and feelings that are separate from yours. This is related to concepts such as empathy, sympathy, and altruism.

Suggested Readings

Cheney, Dorothy L., and Robert M. Seyfarth. 2018. *How monkeys see the world: Inside the mind of another species*. University of Chicago Press.

Hare, Brian and Vanessa Woods. 2020. *Survival of the Friendliest*. Penguin Random House.

Hare, Brian and Vanessa Woods. 2020. *Survival of the Friendliest: Natural selection for hypersocial traits enabled Earth's apex species to best Neandertals and other competitors*. *Scientific American*, vol. 323, no. 2, pp. 58-63.

Lewis, Barry, Robert Jurmain, and Lyn Kilgore. 2007. *Understanding Physical Anthropology and Archaeology*. Thomason-Wadsworth.

Woods, Vanessa. 2010. *Bonobo Handshake*. Black, Inc.

Videos

Attenborough, David. 2003. The Life of Mammals. [BBC Video](#).

The Atlantic – *Animals have culture, too*

(<https://www.theatlantic.com/video/index/550373/animal-behavior-culture/>)

NOVA 2008: *Ape Genius*.

NOVA 2016: *Koko: the Gorilla Who Talks*.

Vanessa Woods (EG6 Conference talk on Vimeo):

<https://www.egconf.com/videos/vanessa-woods-author-bonobo-expert-eg6>



[For Ring Tailed Lemurs, the Ladies Rule | Wild Love - YouTube](#)

[The Cutest Little Predator | Wild Indonesia - YouTube](#)

[Smallest Monkey Turf War | World's Weirdest – YouTube](#)

[Howler Monkeys | National Geographic - YouTube](#)

<https://www.youtube.com/watch?v=q8ZG8Dpc8mM>

<https://www.youtube.com/watch?v=nVmNOT1W-Ss>

[How Fast Can Gibbons Swing Through the Forest? - YouTube](#)

<https://youtu.be/Fqjf1mB5PjQ>

[Chimpanzees are 'just like us' – BBC REEL – YouTube](#)

[Things You Probably Didn't Know About Cute Bonobos | National Geographic - YouTube](#)

[Chimps & Tools | National Geographic - YouTube](#)

<https://www.youtube.com/watch?v=5aAo9KgaP5c>