

Background

All animals adapt to new [ecological niches](#) by changing physically over many generations and by altering their behavior. For most animals, behavioral patterns are predominantly determined by genetic inheritance. Such genetic patterns usually are slow to evolve. It is often many generations before appreciable change occurs. Innate behavioral patterns are characteristic especially of non-mammal species.



Birds have innate abilities to construct species specific forms of nests

In contrast, a large part of primate behavior is learned rather than genetically inherited. As a result, it can be variable from population to population and even from individual to individual. It also can change dramatically in relatively short time periods. Given the potential variability in behavioral patterns within a primate species, problems arise about the validity of field studies. It is difficult to make valid generalizations without studying many different communities.

It is important to keep in mind that despite the fact that behavior patterns of humans and other primates are mostly learned, they are still influenced by our genetic inheritance and external circumstances. Our personalities and emotional states are strongly affected by such things as internal hormone levels and stress inducing situations. However, the manner in which we cope with these stimuli is largely learned from other members of our society as we grow up. We learn appropriate and inappropriate responses. These responses are often gender and age specific. Suitable male behavior may be different than that of females. Likewise, adult and child behavior often differs. We also learn a range of skills that help us better adapt to our environment. This makes primates relatively flexible in their adaptations and allows them to successfully respond to changing environments.

Early primate behavioral studies were conducted mainly in European and North American zoos. During the late 19th and early 20th centuries, it was common for different species to be kept at high densities in the same caged enclosure. Virtually no attempt was made to duplicate natural primate habitats or to provide adequate territories. Individuals were moved in and out of enclosures without concern for the negative impacts on mental health and social groupings. The result was often high stress levels that were expressed in abnormally anxious and aggressive behavior. Not surprisingly, early [primatologists](#) often over emphasized primate aggression because of the intense, often threatening interactions they observed.

Modern zoos usually attempt to rectify the errors of the past by creating primate enclosures that mimic natural habitats. They also try to maintain social group sizes and compositions that are characteristic of the species in the wild. However, even the best zoos fail to provide a truly natural environment. Primate enclosures are limited in size and resources. Group composition and food sources are determined by the zoo caretakers rather than the primates themselves. Even mate selection is usually predetermined for zoo primates. They also have little choice as to whether they have contact with humans. The better zoos work hard to prevent their primates from becoming bored and they monitor carefully for psychological distress. However, even when primate species are kept separate and densities are low, zoos are similar to human prisons for the more intelligent primates, especially the apes. It is not unusual for them to develop abnormal personalities as a consequence. This can be seen in anti-social behavior such as frequently repeated auto-stimulation patterns and avoidance of social contact. Throwing feces at tourists as well as repeated regurgitation and eating of the vomit are examples of such abnormal behavior. The better zoos try to maintain good mental health for their apes by providing more stimulating environments for them. For instance, they hide special food treats in different locations to make a changing game of discovery. In some cases, they also provide televisions.



Psychologically stressed zoo chimpanzee sitting alone in a sterile enclosure trying to close out the world with a tight body posture and a covered face



Free-ranging patas monkeys in an African woodland

The best primate behavioral studies are now done on natural, [free-ranging populations](#). Every effort is made to minimize the effect of contact with humans resulting from the field study. However, the primates are almost always aware that they are being observed and often become familiar and at ease with the observers. It often takes many years of patient observation by primatologists before a reasonably complete picture of individual primate and community life becomes clear. This is due to the fact that primate behavior is complex and varies through time. Ideally, a group of primates is observed in their natural setting for at least half of their lifetime. For most monkeys, this means five or more years. For the great apes, it can be 20-30 years. Jane Goodall and her research group have more or less continuously studied the chimpanzees in Uganda's Gombe Stream National Park since 1960. Long-term studies also have been carried out by other researchers among wild gorillas, orangutans, and some monkey species such as rhesus macaques.

Social Structure

Most primates, including humans, spend their lives in large social groups. In the case of [semi-terrestrial](#) species, such as baboons, being in a large community helps provide protection against predatory cats, dogs, and hyenas. It also helps protect scarce food resources. This is especially true for non-human primates when the food is fruit. Leaf-eaters, such as colobus monkeys and

langurs, tend to form smaller social groupings since there is little competition for their food. The very few nocturnal species of primates are mostly small, relatively solitary hunters.

Most non-human primate communities are more or less closed to contact with members of other communities. Most often, they are tied to a particular locale and rarely migrate outside of their home range. This aloofness from other troops prevents high concentrations of individuals which could result in rapid depletion of local resources. Communities usually avoid each other and are aggressive towards outsiders. As a result, social interactions between members of different troops are usually very rare, especially for females. Chimpanzees are a notable exception. When chimpanzees from different troops come together, there is often an exciting, friendly encounter lasting several hours, following which, some of the adult females switch groups. Apparently, they are seeking new mates.

Interactions within non-human primate communities are usually unlimited. Subgroups are rarely closed from group interaction. All members of a community have daily face to face, casual communication. The most common type of subgroup consists of a mother and her young offspring.



Mother- infant subgroup
(patas monkeys)

In some forest living primates, contact between groups of the same species is in the form of a specialized territorial defense behavior. Instead of avoiding each other, groups actively converge near their common territorial border and make hostile displays. Howler monkeys, indris, siamangs, and gibbons all produce exceptionally loud vocalizations for this purpose. This is a ritualized, essentially harmless form of aggression that is intended to intimidate members of the neighboring community. All four of these species live in home ranges that are usually so small that the food resources of neighboring territories can be seen and become attractive.

Non-human Primate Social Group Composition

While there is considerable variation in social group composition among the primates, there is very little variability within each species. In fact, most non-human primate species are limited to only one of six basic patterns:

1. single female and her offspring
2. monogamous family group
3. polyandrous family group
4. one-male-several-female group
5. multimale-multifemale group
6. fission-fusion society

Humans are an exception in that we form a variety of social group patterns. However, each human society usually defines one of them as being acceptable and condemns the others. Only the multimale-multifemale group pattern is not normally found in any human society.

Single Female and Her Offspring

The single female and her offspring group pattern is rare for primates but common for other mammals. It is found among the orangutans and some of the small nocturnal prosimians (e.g., mouse lemurs and galagos). The adult males lead their lives mostly alone. However, they come together with females occasionally for mating. The males of these species generally have large territories that overlap those of several females.

Single female and
her offspring

(orangutan mother
with child carried
on her back)



Monogamous Family Group

Monogamous groups consist of an adult male and female with their children. When they are grown, the children leave to create their own [nuclear families](#). While this group pattern is the most common one for humans, it is rare for non-human primates. It is found among the small Asian apes as well as some of the New World monkeys and prosimians. Specifically, monogamous family groups are the common pattern for gibbons, siamangs, titi monkeys, indris, tarsiers, and apparently some pottos.

Polyandrous Family Group

The smallest New World monkeys, the marmosets and tamarins, form both monogamous and [polyandrous](#) family units. They generally start with a monogamous mating pair. Later, a second adult male may join the family and assist in child rearing. When this occurs, both adult males will potentially mate with the adult female. This polyandrous mating pattern is extremely rare among non-human primates but does occur in some human societies in isolated rural regions of India, Sri Lanka, and especially Nepal, and Tibet.

Polyandrous
family group

(three pygmy
marmoset adults
sharing child
rearing chores)



One-Male-Several-Female Group

One-male-several-female groups have **polygynous** mating patterns. That is to say, one male regularly mates with more than one female. Polygyny is generally not a promiscuous mating pattern. Rather, the male and his female mates form a distinct mating and child rearing group. This pattern is found among hamadryas baboons, geladas, langurs, howler monkeys, gorillas and many human societies. It has been a culturally preferred marriage pattern in numerous Native American, African, and South Asian cultures. However, polygyny is not as common among humans as monogamy, even in cultures that advocate it.

It would be a mistake to automatically assume that non-human primate one-male-several-female groups are dominated by males. Among geladas, females largely control the social group. This is despite the fact that the males are larger, stronger, and more aggressive. Mothers, sisters, and aunts act as a team in chasing off other unrelated females. They also collectively select their mutual mate among a number of potential suitors roaming in and out of their territory. The male that is chosen usually is one that does not act abusively towards them and is willing to cooperate with them in defending their territory. The relationship with any particular male may be short term. The stable core of the community is the group of related females. This is a long way from stereotypical male domination.

One-male-several female groups may take a different form when predator pressure is a problem. In open grasslands, hamadryas baboon communities are much larger, often consisting of a number of polygynous families. In such multiple one-male-several-female group societies, males are the dominant, controlling members. The adult males not only "herd" their own sexually mature females, but also maintain order and protect the community from predators. This is not unlike the traditional Arab polygynous marriage pattern in which wealthy men acquire harems.

In contrast, gorillas rarely have to be concerned about predator dangers. Subsequently, their communities consist of a single dominant adult male, his mates, and their children. When males reach maturity, they usually are driven off by the dominant silverback male. These exiled males ultimately form their own one-male-several-female groups.

Multimale-Multifemale Group

The most common social group pattern among semi-terrestrial primates is the multimale-multifemale group. With this pattern, there are no stable heterosexual bonds--both males and females have a number of different mates. This is characteristic of savanna baboons, macaques, as well as some colobus and New World monkey species.

Multimale-multifemale groups commonly have a **dominance hierarchy** among both males and females. Each individual is ranked relative to all other community members of the same gender. This tends to reduce serious violence within the community since everyone knows in advance who they must defer to and who must be submissive to them. Among rhesus macaques, one's position in the dominance hierarchy is determined by the rank of his or her mother. The top ranking

individuals are referred to by primatologists as the **alpha male** and the **alpha female**. All other community members defer to them. A female's rank in the hierarchy stays with her throughout life. However, most young adult male rhesus macaques leave their natal community and ultimately join others to find mates. When they do so, they start at the bottom of the male dominance hierarchy again. Alpha males usually mate more often than others. This makes the social organization superficially look like one-male-several-female group. However, younger females often sneak off to mate with males lower down on the dominance hierarchy. The stable core of rhesus macaque communities is the group of female relatives. They stay within their natal community throughout life and work as a team to defend it against other females.

Fission-Fusion Society

A fission-fusion society is one in which the social group size and composition change throughout the year with different activities and situations. This is the social pattern typical of chimpanzees. Individuals enter and leave communities from time to time. Adult males occasionally wander off and forage alone or join a few other males in a hunting party. Females casually change membership from one group to the other. This occurs especially when females are in [estrus](#) and seeking mates. As a result, foraging and sleeping groups reform frequently. Male chimps are the relatively stable core of the community since they rarely join other troops.

What allows for the generally loose relationship between chimpanzee communities is that they apparently recognize a wider range of social bonds than do monkeys. They often have relatives and friends in several different neighboring troops. When chimpanzee communities come together, they usually exchange friendly greetings rather than show aggression. However, it would be a mistake to assume from this that chimpanzee society is always peaceful. The adult males within each community are frequently engaged in complex political activities involving scheming and physical intimidation in order to move up the dominance hierarchy. They develop short-term alliances with other males by mutual support, sharing meat, and **allogrooming** (grooming others). It isn't always the largest and strongest males who make it to the top of the hierarchy. Often teamwork used to frighten and impress is more effective than any one individual's muscles in achieving chimpanzee goals. This is an indication of their intelligence.

Chimpanzees are not the only primates that change group membership from time to time. For instance, adult rhesus macaque males usually must permanently leave the community of their birth and try to join others in order to find mates. This is not easy since they are not warmly welcomed in their adoptive troop. Group composition of some langur and baboon species also change as a result of the availability of food and mates. Evidently, none of these monkey species change group composition with the ease and frequency of chimpanzees. As a result, their societies are not usually referred to as fission-fusion types.

Social Group Pattern	Primate Species Following This Pattern
single female and her offspring	orangutans, some of the small nocturnal prosimians (mouse lemurs and galagos), and some humans
monogamous family group	some New World monkeys (titi monkeys), some prosimians (indris, tarsiers, and some pottos), the small Asian apes (gibbons, siamangs), and some humans
polyandrous family group	the smallest New World monkeys (marmosets and tamarins) and some humans
one-male-several-female group	hamadryas baboons, geladas, langurs, howler monkeys, gorillas, and some humans
multimale-multifemale group	savanna baboons, macaques, colobus, and some New World monkeys
fission-fusion society	chimpanzees

Kinship

Kinship refers to relationships that are recognized between individuals based on family ties. Among humans, those ties are created by marriage and shared descent from ancestors. Among non-human primates, they are due to descent. Most non-human primates apparently only recognize **matrilineal descent**. That is, they know who their mother is but not their father. Socially recognized paternity is unimportant or non-existent for them. The strongest social unit is a mother and her young children. Chimpanzees maintain their bonds with their mother well into adulthood. When they are threatened by others, even large male chimpanzees may go to their aged mother to be soothed by grooming. As mentioned earlier, the social ranking of juvenile rhesus macaques precisely corresponds to the ranking of their mothers. Shared descent from the same female is also the basis of close relationships between macaque sisters, aunts, and nieces. Another indication of the recognition of matrilineal descent is the fact that incest in the form of mother-son mating is rare for primates.

Gender Differences

Behavioral differentiation of male and female primates involves more than just mating behavior. Males are usually larger and physically dominant over females. Extreme [sexual dimorphism](#) is particularly characteristic of the semi-terrestrial monkeys and great apes. The manner in which male and female children are socialized often differs. Following infancy, age-based play groups are usually the primary socializing group for males. These juvenile male cohorts often spend much of their time on the fringes of the troop territory in active physical play. For example, nearly half of the waking hours of young male gorillas are spent in rough play. This is comparable to the amount of time human children play if



Extreme sexual dimorphism among adult mandrills (female on left, male on right)

given the opportunity. For most non-human primates, play is critical for developing social bonds and social skills. Young female monkeys and apes are more often socialized in the safer areas of the community territory by their mothers and other older female relatives. Their play is usually less rough and focuses more on developing parenting skills and social ties among the females with whom they usually spend their lives. As adults, male primates are more likely to leave the community to join roaming bachelor groups and eventually join other communities. Chimpanzees are somewhat of an exception. While male chimpanzees often roam, it is the females who switch communities. However, they usually stay physically close to their own mothers until they become sexually mature around 11 years of age or somewhat later.

NEWS: *In a November 21, 2006 Current Biology report, Martin Muller and his colleagues describe the mating patterns of common chimpanzees in Uganda's Kibale National Park. Male chimps generally prefer to mate with females who are 30 years of age or older. These older females are also more often fought over by males. Even balding 55 year old females with worn and broken teeth apparently are more appealing to males than are young healthy females, aged 15-20. Muller speculates that the appeal of older females is that they have been successful in surviving and in having and raising offspring.*

Adaptations of Group Living

Most primates do not shape their environment in an adaptive way. They use it as it is without modification. The sleeping nests of the great apes are poor, roofless constructions created for only one night. Monkeys simply sleep on convenient tree branches without making nests. No primate other than humans is known to store food. They have a hand-to-mouth economy which forces everyone to seek food and water daily. However, common chimpanzee and bonobo males cooperate in hunting monkeys and other small game. While they do not store the meat, they do use it for social gain by sharing it. Jane Goodall has observed a chimpanzee carry a carcass as far as a mile over grasslands to reach the safety of trees before eating it.

Tool manufacture and use are virtually non-existent among non-human primates. However, gorillas, common chimpanzees, bonobos, orangutans, and capuchin monkeys are notable exceptions. Some of them use very simple tools to help in acquiring food and water. For instance, chimpanzees have been observed stripping the leaves from twigs to make probes to get termites and ants to eat. Twigs are also used by them at times as toothpicks. Crinkled leaves are employed as sponges to get water from hollows in trees for drinking. Rocks and broken tree branches are used to crack nuts and sometimes throw at other chimpanzees in order to intimidate them. Rocks are used at times as projectiles in hunting bush pigs and other small game. However, chimpanzee coordination in throwing is very poor, so rocks and pieces of wood are inefficient weapons for them. Their easy excitability also prevents them from being stealthy hunters. It is important to keep in mind that all of these very simple tool uses by chimpanzees must be taught to



Orangutan mother showing her child how to use a tool to get food out of a crevice

children by their parents and other adults. They are not genetically inherited patterns of behavior. As a result, different communities invent different tools. It would not be surprising to discover other examples of simple tool use by non-human primates as more species are carefully observed for long periods of time.



Juvenile gorilla learning from an adult by casual observation

An important advantage that primates have in the competition for survival is their practice of living in societies which have a constant close association of young and old through a long life duration. The young learn survival skills from experienced, knowledgeable adults. The result is that by the time primates are grown, they are usually proficient in dealing with each other and the environment. While primate instinctive survival skills are minimal, their social skills are unusually effective. Acting together in groups, they often can avoid or intimidate predators. Groups of primates also have a greater opportunity in discovering and controlling food sources.

The majority of primate species are primarily or exclusively vegetarian. Non-human primate groups usually search for plant foods in a dispersed pattern within their territory. This increases the likelihood that food sources will not be missed. Foraging in tightly spaced groups is successful only if the food appears in concentrated clusters. With the exception of some chimpanzees, most primates do not use calls to inform others when they find food. The message spreads slowly and reaches the entire group only if the food is abundant. Non-human primates are generally stingy, except when dealing with young infants. Feeding monkeys usually tolerate others only beyond a certain distance. When monkeys observe another member of the troop stuffing food into his or her mouth, they usually rush over to get some as well. Inadvertently, the monkey who discovers a desirable food source communicates its presence by his or her actions. In this way, information about food sources is shared.

Once again, chimpanzees are exceptions. Males regularly hunt for meat in small teams. When a target animal has been killed, the dominant hunter initially monopolizes the meat. However, when he has had enough to eat, he usually shares with other hunters and even with females and children who have not participated in the hunt. More easily obtainable vegetable foods are rarely shared by chimpanzees and bonobos except by mothers with their children. Mothers use this opportunity to teach their children what is edible in the environment. They also teach them important skills such as nut cracking techniques.

Among chimpanzees and baboons, the size and composition of the [foraging group](#) normally adjusts to the size of the food supply. Strictly arboreal monkeys are not equally flexible--the entire community makes up a single foraging group. This is related to the fact that their forest territories are usually smaller and richer in vegetable foods.

Why are Primates Intelligent?

Compared to most other animals, primates have unusually large brain to body size ratios and are significantly more intelligent. This is particularly true of the great apes and, of course, humans. When chimpanzees look in a mirror, they recognize themselves. This self-awareness is extremely rare in the animal kingdom. Even monkeys lack this capability. It was commonly believed that only humans had the necessary intelligence to recognize their own reflected image. The fact that we share self-awareness with at least some of the great apes is not surprising considering the short evolutionary distance between our species. We had a common ancestor with chimpanzees only 6-7 million years ago.



Does this douc langur have the face of an intelligent animal?

In the past, biological anthropologists believed that the relatively high intelligence of the great apes and humans was a result of natural selection favoring tool making. However, it is now clear that ape tool use is relatively modest compared to humans and even some insects. Bee hives and termite mounds are certainly more complex structures than anything apes create.

It has been suggested by some researchers that the large ape brain was mainly selected by nature for dealing with complex social interaction and only secondarily for tool making and manipulating things in their environment. The connection between social skills and intelligence can be seen operating in chimpanzee societies. Success for an individual usually requires that he or she has the ability to learn from others, invent new behaviors, comprehend the status and complex emotions of all other troop members, and can use this knowledge to gain advantages. Chimpanzees learn how to influence and even manipulate the emotions of others. Adult males in particular become experts at bluff, deception, and intrigue. They are scheming political animals who spend much of their time creating and maintaining alliances with other males. In order to succeed, they need to be "chess masters" of their social worlds. The ability to predict combined effects of yours and other's actions and to control your own emotions and behavior may be among the most important characteristics that led to the large ape brain. Ultimately, it may have led to the even larger and more intelligent human brain. This idea is supported by recent neurobiological research done by John Allman and his colleagues at the California Institute of Technology. They discovered that there is a particularly large type of spindle-shaped neuron cell in the brain that is apparently unique to apes and humans, and concentrated more in people. These neurons are in areas of the brain known to be involved in complex decision making.

As we have seen, behavioral patterns of non-human primates are largely non-instinctive. The great apes in particular rely heavily on their learned skills and knowledge to survive. In the past, many anthropologists resisted referring to this as **culture**. They preferred to reserve the term for more complex human knowledge, traditions, and skills. However, if culture is defined more broadly as learned behavior patterns, then we must accept that at least some non-human primate communities do have cultural knowledge that they pass on to their children informally much the same way humans do. Basic survival skills are taught to children mostly by mothers and other adult females within all primate species, including our own. Some anthropologists have suggested that since the cultural

knowledge of non-human primates is, at best, quite rudimentary, it is appropriate to call it **protocultural**. That is to say, they have the beginnings of culture.

Evolutionary Significance of the Primate World Distribution

One sign of a biologically successful species is the size of its geographic range and the number of different environmental zones it inhabits. Those species that are only able to adapt to very limited ranges are relatively less successful. Based on this criterion, common chimpanzees are the most successful ape and macaques are the most successful monkey. Since the human range includes all of the other primate ranges plus a massive expansion into colder regions and onto isolated oceanic islands, we are the most successful primate. What has allowed us to do this has been our significantly greater intelligence and the development of our complex cultural survival technologies. In a sense, human culture has allowed us to live in various harsh environments without adaptively radiating into different species. We became different kinds of cultural animals rather than different biological species as we adapted to new environments.

***NEWS:** In a July 7, 2007 [PloS Biology](#) report, Felix Warneken et.al., described their experimental evidence of semi-free ranging chimpanzees unselfishly helping each other and humans without apparent rewards. This sort of altruism was thought to be unique to humans in the primate order. The authors suggest that this indicates altruistic behavior patterns must go back in our evolutionary line before the split with the ancestors of chimpanzees.*

***NEWS:** In a May 15, 2007 [Current Biology](#) report, Simon Townsend et.al., described a violent attack by 6 female wild chimps on a female from another community that resulted in serious wounds for her and the death of her infant. They also referred to two other similar attacks that have been observed recently. This is surprising news since normal female primates were not known to instigate such murderous attacks and infanticide. It is more commonly a male behavior.*

Communication

Most primates spend their lives in complex, tightly woven societies and need to frequently communicate with each other. They communicate with smells, sounds, visual messages, and touching. Non-human primates emphasize the use of [body language](#). Human communication is far more focused on the use of oral sounds. Our speech is radically different from the hoots, howls, whistles, barks, slaps on the ground, and other sounds used by non-human primates to communicate. Our languages are complex **symbolic systems**. That is to say, our words are combinations of sounds to which we arbitrarily assign a specific meaning. Like all symbols, the meaning of words cannot be discerned by listening to the sounds. They must be explained. This is very different from a universally understood cry out from pain or fear.



Human communication using a system of symbols for oral and written language

Human language also has the characteristics of being both open and discrete. **Openness** refers to the ability to communicate about totally new things and ideas. In contrast, other primates almost exclusively communicate their present emotional mood and intentions. They are focused on the here and now. **Discreteness** refers to spoken words being individually distinct from others in the same phrase or sentence--they don't blend together. The oral sounds of some apes and monkeys are somewhat discrete at times as well. Unlike us, however, their communication does not involve **displacement**. That is, they apparently do not "talk" about things and events that are not here and now. People discuss such things as what the world was like two centuries ago. There is no evidence that non-human primates do this.

Can non-human primates learn and use human languages? Do they have the mental ability to comprehend a symbolic communication system and to use it creatively? Research with chimpanzees, bonobos, and gorillas to answer these questions has been ongoing since the 1960's. It is now clear that at least the great apes can learn and use a simplified version of the American Sign Language for the Deaf (ASL). However, it is not universally agreed that they can do so in an innovative way like adult humans. One of the stars in this research has been a male bonobo named Kanzi. Listen to the audio slide show linked below and make up your own mind about how well he uses language.

Non-Human Primate Communication



Chimpanzee begging gesture and facial expression

Odors, [vocalizations](#), gestures, and facial expressions are used by non-human primates to inform others of their psychological state and present concerns, which is an important clue to what they are likely to do next. In the picture on the left, the outstretched hand and pleading facial expression directed toward another troop member are obvious indications of this chimpanzee's appeal for sharing. It also probably reflects and reinforces his or her lower position on the dominance hierarchy within the community.

Primatologists have observed that some communication patterns are commonly used by many primate species. These are discussed below.

Prosimians have excellent [olfactory](#) sensing abilities. It is not surprising, therefore, that they usually use body odors to communicate. Adult male ring-tailed lemurs regularly mark their woodland territories with chemicals produced by scent glands in their wrists. This is similar to dogs, wolves, and cats marking their territories with urine. In both cases, the scent is recognized as a personal signature. Tamarins and marmosets also use scented urine to mark the gum trees that are

important food sources in their territories. In all of these species, **scent marking** is a way of claiming territory and warning off intruders.

Most primate species, including humans, use threatening gestures, stares, and poses to intimidate others. Primatologists refer to this particular use of body language as **agonistic displays**. Among non-human primates, they are usually sufficient to prevent physical fighting. In fact, physically violent encounters are rare among them. The dominant male in a monkey or ape community can usually prevent major conflicts and keep order by the use of often subtle agonistic displays. For instance, male baboons flash their eyelids. If this isn't sufficient, they open their mouths widely in a manner that looks like human yawning. Since the marmosets and tamarins cannot significantly change their facial expressions, their agonistic displays are different. Adult males chirp repeatedly and turn around to show their genitals from behind.



Agonistic displays by a human and a male mandrill

Most primate species communicate affection and reduce group tension by sitting close to each other, touching, and mutually grooming. The latter is referred to as **allogrooming** in contrast to self or autogrooming. Allogrooming is a powerful tool for communication. It is used by both monkeys and apes to reinforce male-female mate bonds as well as same sex friendship bonds. Chimpanzees often have ecstatic bouts of allogrooming that go on for hours when an old acquaintance rejoins the community. They also do it to calm emotions following wild, aggressive outbursts by angry adult males. Most members of the community also seem to very much enjoy grooming infants and may compete for the opportunity.



Allogrooming chimpanzees, douc langurs, and crab-eater macaques

It is clear that allogrooming results in both social and psychological benefits for non-human primates. It often serves much the same purposes for humans, whether it be in the private setting of a family at home, where a parent might brush a child's hair, or in a public barbershop or salon. The experience of having someone run their fingers through your hair and massage your head in the process is usually physically pleasurable, and it generally provides a period of time removed from work or school concerns when relaxed, casual conversation occurs.

Among some species of primates, including humans, the urge to allogroom is so strong as to result in grooming animals of other species. Among non-human primates, inter-species allogrooming occurs

when they are in captivity and deprived of the opportunity to groom their own kind. They are even known to groom people. However, it does not seem to be a pattern of wild non-human primates.



A macaque and a human enjoy holding and grooming puppies (The dogs also enjoy it)

Petting a willing, appreciative dog has been shown in experiments to reduce the blood pressure of humans. This surprising psychological effect potentially has medical implications.