

## Humans as Primates

Humans are members of the biological order *Primates*, family *Hominidae*, subfamily *Homininae*, which includes humans, chimpanzees, bonobos and gorillas. Members of this subfamily have 97% of their DNA in common. DNA research indicates that humans diverged from the line of primates to become a separate species about 5.5 million years ago. More recently, about 2.5 million years ago, chimps and bonobos diverged from each other; they are our closest genetic relatives.<sup>1</sup>

Chimps are found in Central and West Africa, north of the Congo River, where the habitat is relatively dry and open. Bonobos are found only south of the Congo River, in dense, humid forests. Since neither can swim, the river seems to have served as a barrier that enabled the bonobo to evolve into a separate species. Or perhaps it is chimps and humans that evolved away from the ancient species from which all three are descended, and bonobos, having stayed in the ancestral habitat, are closest to that ancient precursor.

Chimps, bonobos and humans exhibit many similarities. All are social and inquisitive; all use tools; all exhibit cooperation within the group, empathy and altruism (helping others at some cost to oneself). There are many significant differences as well. The most obvious is that humans are far more intelligent and exhibit a much broader range of behavior than the others. The most notorious difference between chimps and bonobos is that chimps are patriarchal, violent and aggressive, and bonobos are matriarchal, peaceful and sexual.

Chimps have the reputation of being “killer apes.” Their society is extremely hierarchical, with constant jockeying among males for the top position, and frequent fights, some quite bloody, among them. Conflicts among males are solved through violence and aggression. The hair of a male chimp stands on end at the slightest provocation. He will pick up a stick and challenge anyone perceived as weaker. Chimp males patrol their territorial borders and murder intruders from other bands. Bands of chimp engage in lethal aggression against their neighbors. Brutal violence is part of the chimp’s natural makeup.

By contrast, among bonobos there is no deadly warfare, little hunting, no male dominance, and enormous amounts of sex. Bonobos have sexual contact with each other quite frequently, males with females, females with females and males with males. (It may be that this account is skewed by observation of bonobos in captivity; in the wild, observers have not seen as much sexual activity, but it is impossible to observe bonobos as closely there.) When different bands meet, there is no fighting; instead, individuals have sex with each other. Sex seems to be a way to defuse tension in advance of conflict, particularly over food. But anything, not just food, that arouses the interest of more than one bonobo at a time tends to result in sexual contact. After a flurry of sex, the apes settle down to eat or investigate whatever has piqued their interest. Dominance hierarchy is matrilineal; males derive status from their mothers.

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<sup>1</sup> The information in this section comes primarily from the writings of Franz de Waal, in particular his *Our Inner Ape*.

Because of their genetic similarity, it is useful to compare salient characteristics of chimps, bonobos and humans. From this comparison we can find out in what ways humans are like our animal kin and in what ways we are unique. The following table summarizes the comparison.

Trait or behavior	Chimpanzees	Bonobos	Humans
<b>Dominance hierarchy</b>	<ul style="list-style-type: none"> <li>▪ Very hierarchical</li> <li>▪ Male-dominated</li> <li>▪ Enforced by aggression and alliances</li> <li>▪ Highly political</li> <li>▪ High rank provides sexual mates and food for males; females trade sex for food.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very hierarchical</li> <li>▪ Female-dominated</li> <li>▪ Enforced by cultivated alliances</li> <li>▪ High rank provides food for females and their families.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Humans are highly attuned to power and social hierarchy.</li> <li>▪ Form varies by culture and historical epoch. In historical times, mostly male-dominated.</li> <li>▪ Highly political.</li> </ul>
<b>Relations toward out-group</b>	<ul style="list-style-type: none"> <li>▪ Highly aggressive</li> <li>▪ Highly territorial</li> <li>▪ Gentle to members of in-group; hostile to out-group</li> <li>▪ Cooperation within in-group</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low aggression</li> <li>▪ Has capacity for violence, but generally avoids it.</li> <li>▪ Territorial, but no territorial competition. Gentle to members of in-group and out-group.</li> <li>▪ Cooperation within in-group and with out-group.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Territorial</li> <li>▪ Gentle to members of in-group; hostile to out-group</li> <li>▪ Conflict resolution through wars and feuds among clans, but also sophisticated negotiation and diplomacy</li> <li>▪ Conflict avoidance through diplomacy and proactive peacemaking</li> <li>▪ Both competitive and community-building; each society reaches its own balance.</li> <li>▪ Able to cooperate within in-group and with out-group.</li> </ul>

Trait or behavior	Chimpanzees	Bonobos	Humans
<b>Handling of in-group conflict</b>	<ul style="list-style-type: none"> <li>▪ Resolve conflict through domination</li> <li>▪ Physical force</li> <li>▪ Politics, alliances</li> <li>▪ Resolve sexual issues with power</li> <li>▪ Able to cope with crowding if there is enough food.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Avoid conflict through sexuality</li> <li>▪ Resolve power issues with sex.</li> <li>▪ Able to cope with crowding if there is enough food.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Conflict resolution through feuds among clans and individual fighting, but also sophisticated negotiation and diplomacy</li> <li>▪ Conflict avoidance through pro-active peacemaking and compassionate communication</li> <li>▪ Able to cope with crowding if there is enough food.</li> </ul>
<b>Peacemaking and reconciliation</b>	<ul style="list-style-type: none"> <li>▪ Reconciliation common after fights</li> <li>▪ Males reconcile more easily than females</li> <li>▪ Females have fewer fights, but grudges last longer</li> <li>▪ Mutual dependency fosters harmony</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reconciliation common after disputes</li> <li>▪ Females reconcile more easily than males</li> <li>▪ Mutual dependency fosters harmony</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pragmatic solutions to conflict</li> <li>▪ Males reconcile more easily than females</li> <li>▪ Male discord obvious; female discord more subtle</li> <li>▪ Females hold grudges longer than males</li> <li>▪ Mutual dependency fosters harmony</li> </ul>
<b>Sexuality</b>	<ul style="list-style-type: none"> <li>▪ Sporadic</li> <li>▪ Only dominant males get to mate with females</li> <li>▪ Females periodically in heat; visible signal when fertile.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Frequent</li> <li>▪ All males mate with females</li> <li>▪ Females periodically in heat; visible signal through longer portions of the estrus cycle, not just when fertile.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mostly a private affair</li> <li>▪ Variety of cultural prohibitions</li> <li>▪ Females sexually receptive all or most of the time; no visible signal.</li> </ul>

Trait or behavior	Chimpanzees	Bonobos	Humans
<b>Reproductive strategy</b>	<ul style="list-style-type: none"> <li>▪ Only dominant males get to reproduce</li> <li>▪ Male enforces his own lineage</li> <li>▪ Infanticide</li> </ul>	<ul style="list-style-type: none"> <li>▪ All or most males reproduce</li> <li>▪ No way to tell who is the father</li> <li>▪ No infanticide; all infants allowed to live</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pair-bonding and nuclear family ensures resources for children</li> <li>▪ Every male has the potential to reproduce</li> <li>▪ Sex limited to nuclear family means every male knows whose children are his.</li> <li>▪ This allows males to cooperate in groups away from the females.</li> </ul>
<b>Kindness, altruism, empathy and theory of mind (1, 2, 3)</b>	<ul style="list-style-type: none"> <li>▪ Console others in distress</li> <li>▪ Know what others know, can take another's viewpoint</li> <li>▪ Recognize self in mirror</li> <li>▪ Exhibit targeted helping</li> </ul>	<ul style="list-style-type: none"> <li>▪ Console others in distress</li> <li>▪ Know what others know, can take another's viewpoint</li> <li>▪ Recognize self in mirror</li> <li>▪ Exhibit targeted helping</li> </ul>	<ul style="list-style-type: none"> <li>▪ Highly empathic</li> <li>▪ Empathy develops before language</li> <li>▪ Highly-developed theory of mind</li> <li>▪ Highly-developed capacity for self-knowledge</li> <li>▪ Can be highly altruistic; wide variety of targeted helping</li> </ul>
<b>Tool use</b>	<ul style="list-style-type: none"> <li>▪ Wide variety of tools such as sticks and stones</li> </ul>	<ul style="list-style-type: none"> <li>▪ Tool use not common in the wild, but has been seen in captivity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Highly advanced</li> </ul>
<b>Language</b>	<ul style="list-style-type: none"> <li>▪ Emotive sounds</li> <li>▪ Little conceptual language</li> <li>▪ Signal emotions and intentions through facial expressions and hand gestures</li> </ul>	<ul style="list-style-type: none"> <li>▪ Emotive sounds</li> <li>▪ Little conceptual language</li> <li>▪ Signal emotions and intentions through facial expressions and hand gestures</li> </ul>	<ul style="list-style-type: none"> <li>▪ Language highly complex, both emotive and conceptual</li> <li>▪ Nonverbal emotional communication widespread</li> </ul>

Trait or behavior	Chimpanzees	Bonobos	Humans
<b>Physical contact</b>	<ul style="list-style-type: none"> <li>▪ Hugging and grooming common</li> <li>▪ Isolation is painful</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hugging, grooming and sexual contact common</li> <li>▪ Isolation is painful</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hugging and touching common</li> <li>▪ Isolation is painful</li> <li>▪ Varies among cultures</li> </ul>
<b>Food</b>	<ul style="list-style-type: none"> <li>▪ Omnivorous, fruit preferred</li> <li>▪ Have sophisticated hunting strategies requiring cooperation, influence and rank</li> </ul>	<ul style="list-style-type: none"> <li>▪ Eat mainly fruits, but supplement their diet with leaves and sometimes the meat of small vertebrates</li> <li>▪ Have rudimentary hunting strategies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Omnivorous</li> <li>▪ Have sophisticated hunting strategies</li> <li>▪ Have sophisticated agricultural strategies</li> </ul>
<b>Time orientation</b>	<ul style="list-style-type: none"> <li>▪ Focused on present</li> <li>▪ Remember past grievances and favors; avenge the former and reward the latter</li> <li>▪ Rudimentary ability to anticipate the future</li> </ul>	<ul style="list-style-type: none"> <li>▪ Focused on present</li> <li>▪ Remember past grievances and favors; avenge the former and reward the latter</li> <li>▪ Rudimentary ability to anticipate the future</li> </ul>	<ul style="list-style-type: none"> <li>▪ Can focus on past, present and future</li> <li>▪ Greatly enhanced ability remember and document the past</li> <li>▪ Greatly enhanced ability to anticipate and plan for the future</li> </ul>
<b>Brain size and EQ (4)</b>	<ul style="list-style-type: none"> <li>▪ 275-752 cm<sup>3</sup></li> <li>▪ EQ = 2.38</li> </ul>	<ul style="list-style-type: none"> <li>▪ 275-752 cm<sup>3</sup></li> <li>▪ EQ = 2.38</li> </ul>	<ul style="list-style-type: none"> <li>▪ 1100-1700 cm<sup>3</sup></li> <li>▪ EQ = 6.28</li> </ul>
<b>Play</b>	<ul style="list-style-type: none"> <li>▪ Juveniles play</li> </ul>	<ul style="list-style-type: none"> <li>▪ Juveniles play</li> </ul>	<ul style="list-style-type: none"> <li>▪ Juveniles and adults play</li> </ul>

### Notes

(1) Empathy is the ability to be affected by the state of another individual or creature. This is seen in bodily mimicry as well as emotional contagion. Emotional empathy has its roots in bodily mimicry, as one individual unconsciously mimics the facial expression of another.

(2) Theory of mind is the ability to recognize the mental states of others. It means that one individual has an idea, a theory, about what another individual believes, perceives or intends to accomplish.

(3) Targeted helping is giving aid tailored to another's needs; requires a distinction between self and other, recognition of the other's need and sympathy for the other's distress.

(4) EQ, or Encephalization Quotient is the ratio of the actual brain mass to the expected brain mass of a typical animal of a certain size. The expected brain mass is that required for basic survival tasks. If the actual brain mass is larger than expected, then the extra mass is available for higher-level cognition. Human EQ is much greater than chimp or bonobo EQ.

Bonobos were recognized as a separate species less than 100 years ago and began to be fully documented less than 50 years ago. Before that time, many ethologists and anthropologists believed that humans are innately violent and aggressive. Morality, it was thought, is a veneer of cooperative sociality on an underlying bestial nature. Now that we know about bonobos, the range of human behavioral potential seems to have expanded. We recognize that humans have the capacity to live in peace and to defuse conflict proactively with pleasure. In addition, male dominance seemed a natural part of things until the discovery of bonobos; now we see that dominance by females may be equally natural.

Two things stand out from the comparison of species above. First, our difference from chimps and bonobos is a matter of degree, not kind. There are few, if any, uniquely human traits that chimps or bonobos do not have to a lesser degree. We are embedded in nature and are not a species unique and special. The one trait that seems most unique is the cultural, not biological, innovation of nuclear family pair bonding.

Second, humans have the capacity to amplify the characteristics found in our sibling species. Humans have greater brain size and intelligence, so we can do more effectively all the things our siblings can. For instance, our use of tools and technologies enables us to produce food in more variety and abundance. Our use of language enables us to communicate more effectively and to perpetuate what we learn through culture. Chimps and bonobos seem to be able to conceptualize that something not happening in the present will happen later, but humans have a greatly enhanced ability to visualize and anticipate the future.

Hence, humans can be more aggressive but also more peaceful, more competitive but also more cooperative. We are more flexible and have more options than our fellow creatures. We have a great variety of possible behaviors, possible ways of being. And, through our ability to anticipate the future, we have a choice as to which of these we will actualize.

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