

Bonobo-Human Link Overlooked

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Abstract: When discussing the last common ancestor of humans and our close relatives, the bonobo has been historically excluded or misrepresented as being a chimpanzee, humans are not lumped with our ancestors so neither should the bonobo. The genetic research on bonobos is non-existent. A main possibility for this may lie in the social organization of bonobos. This work examines the current lack of genetic research on bonobos and highlights the importance of performing such work.

Introduction

Similarities and differences between chimpanzees and humans have long been a topic of interest for anthropologists. Although research shows that bonobos and chimps are very similar, they are so often lumped into one species that chimp data is used to explain the similarities of both to humans. Of course this is incorrect as they are two separate species; even the nickname “pygmy chimp” given to the bonobo is a misnomer as the two species overlap in size (Wrangham, McGrew, de Waal, & Heltne, 1996).

The morphological research that has been conducted on bonobos is good (Wrangham et al., 1996), however, there is a severe lacking in terms of genetic work on bonobos that needs to be addressed. I present a hypothesis on why bonobos have been ignored and, after assessing the state of current research, discuss why it is important for genetic research on bonobos to be completed.

Chimps Used to Mean Chimps and Bonobos, Bonobos Ignored

Bonobos and chimpanzees comprise the closest living relatives to humans (Goodman, 1999; Ruvolo, 1997; Varki & Nelson, 2007). However, only chimpanzees are looked upon for insight into human life.

Why are differences between bonobos and chimps stated but then overlooked when it comes to comparing these primates to *H. sapiens*? Take the following excerpt from *Nature* (The Chimpanzee Sequencing and Analysis Consortium, 2005) for example.

“Modern molecular studies have spectacularly confirmed this prediction and have refined the relationships, showing that the common chimpanzee (*Pan troglodytes*) and bonobo (*Pan paniscus* or pygmy chimpanzee) are our closest living evolutionary relatives.

Chimpanzees are thus especially suited to teach us about ourselves, both in terms of their similarities and differences with humans.”

As can be seen from the above, it is explained that chimps and bonobos are our closest relatives yet only chimpanzees are “suited to teach us about ourselves.” Either the author fatally believes that only chimps can provide valuable insight or the author incorrectly lumps bonobos and chimps together; most agree that *Homo heidelbergensis* is one of our ancestors but we are not referred to as such nor are we known as any of our other ancestors. In addition, chimps are used as “...fun house mirrors of who we once were and what we might have become had evolution taken a different course. Among the four great ape species, chimps received the lion’s share of attention as models of early humanity.” (Stanford, 2001)

Current State of Bonobo Research

It would be incorrect to state that there is an absence of bonobo research. However, more study needs to be done on bonobos (Boesch, Hohmann, & Marchant, 2002). The literature is problematic in the area which examines if the bonobo or chimpanzee has more primitive or derived traits from the common ancestor (Wrangham et al., 1996). However, the literature does not really overlook bonobo-chimp differences, in fact morphological differences have been well studied (Wrangham et al., 1996). Ruvolo (1997:536) writes that bonobos “differ substantially from common chimpanzees in their morphology and behavior, this [the lack of research on bonobos] is a glaring omission in our knowledge of hominoid diversity.” Ruvolo (1997:527) also stated that bonobos are the “most poorly genetically surveyed species among the large-bodied hominoids.” Genetic distance is not shown (Goodman, 1961) between bonobos and humans and bonobos and chimps in any work.

However, though it is known that there is some genetic difference between bonobos and humans as well as between bonobos and chimps, a thorough investigation of the research could yield no quantitative genetic difference or relatedness in regards to bonobos and their close relatives. Yet other research (McIntyre, Herrmann, Wobber, Halbwx, Mohamba, de Sousa, Atencia, Cox, & Hare, 2008) compares morphological traits like the ratio of the second (2D) and fourth digits (4D) on hands in humans, chimps and bonobos. Findings show bonobos having a closer 2D:3D ratio to humans than chimpanzees do. It is unknown as to if this arose due to homoplasy. However, this is an important argument to investigate as it may be shown that this trait is primitive and that chimps derived away from this characteristic, yielding information on a last common ancestor.

Additionally, bonobos and humans have much more things in common, characteristics that are not shared with the chimpanzee. For example, humans and bonobos are the only animals to not

be confined by the chains of estrus. Specifically, with humans and bonobos, there is not a specific time when the female is the most fertile, thus, evolution produced an adaptation where the male will spend more time with the female since there is not a given time in which he can impregnate her (Stanford, 2001). In addition, the bonobo and human are the only primates and non-human animals to not utilize a dorsal ventral position during intercourse (Ford & Beach, 1951; Goodall, 1986, 1990; Wickler, 1973). Further, both bonobos and humans are monotypic, (Ruvolo, 1997) meaning they have only no subspecies (or true biological races), unlike the chimp which has at least three distinct groups (Gonder, Oates, Disotell, Forstner, Morales, & Melnick, 1997).

To sum up the literature thus far, there is no consensus or conclusions genetic difference issues between the chimp and bonobo nor the chimp and human. Especially relevant are questions aimed at determining the relatedness of chimps, bonobos, and humans and how that information can be used for positive academic conclusions like disease fighting and reconstruction of the last common ancestor, which I discuss later.

Because of the lack of genetic research, Sarich (1984) is unsubstantiated when he says “there cannot be any special evolutionary relationship between pygmy chimps and hominids.”

Consider my earlier examples when I discuss certain similarities between only bonobos and humans.

As stated, there are at least three subspecies of chimp. Which is closer to humans? Is it closer to humans than bonobos? Clearly, these questions cannot be answered with the current research. It is certainly plausible that genetic difference may be the smallest between bonobos and humans. Consider the diagram below.

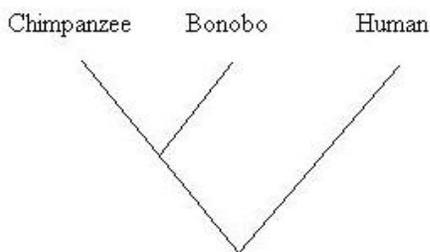


Figure 1. A basic cladogram depicting divergence between chimps, humans, and bonobos.

This cladogram depicts the acknowledged evolutionary path where the *pan* and *homo* line diverged around 5-7 MYA (Berry, 2003). Around 1.5-2 MYA, the bonobo and chimpanzee lines diverged. The current lack in research has not provided us with the genetic difference of bonobos to either chimps or humans. This information is essential. Thus, with the information provided thus far, we cannot be sure that during the bonobos subsequent evolution after splitting from the chimpanzee that it evolved away from or closer to

humans. This question is especially relevant when one considers all the ways in which the bonobo is like the human and unlike the chimpanzee.

Possible Explanations for Overlooking the Bonobo

I hypothesize that the bonobo-human link has been overlooked because of the social organization of the former. Since our social organization is very much patriarchal, like the chimp's social organization system, and because bonobo females are dominant, many researchers may feel that bonobos are "less related" to us than chimpanzees. In fact, "bonobo attacks are often directed by females at males, rather than the reverse, as in chimps" (Stanford, 2001). The prevalence of female attackers in bonobos is also the opposite of how most attacks are thought to happen with humans. Considering the "brotherhood of predominantly male anthropologists" (Stanford, 2001) of the 1960's when primate research began, it is easy to see why social organization have been a factor in preferring chimpanzees. However, in adopting the idea that bonobos are less like us because females are more dominant, there is a definitive flaw. This notion is problematic because social organization is caused less by genetics and more by socialization and adaptation to environment. For example, the difference in the party sizes of bonobos and chimps is not highly likely due to genetics, but to adaptation to environment; chimps must travel in small groups to find food whereas that is not the case with bonobos (Wrangham, McGrew, de Waal & Heltne, 1996).

In addition, bonobos are not as well known and are much fewer in number than chimps, in fact, they are endangered. However, any good anthropologist is familiar with this higher order primate, so ignorance cannot be used as a plausible reason for them being overlooked when discussing shared characteristics of humans and other higher order primates.

Importance of Bonobo Research

Finally, it can be seen that further research in physical anthropology and other close fields should examine the bonobo-human link to find out more about their relationship. This can surely lend information on public health, as chimpanzees have a lesser reaction to HIV and malaria (Wildman, 2002) which makes it logical to hypothesize that bonobos could have similar immune features that may yield information on other ailments. Academically, bonobos can yield information on the origins of bipedalism (since they can remain bipedal longer and easier than chimps) and speech (as do the chimpanzees; Wildman, 2002) in addition to providing information on the common ancestor of chimps, bonobos and humans (Carroll, 2003; Enard & Paabo, 2004; Gagneux, 2004; Gagneux & Varki, 2001; Goodman, Grossman, & Wildman, 2005; Klein & Takahata, 2002; Li & Saunders, 2005; McConkey & Varki, 2005; McIntyre et al., 2008; Olson & Varki, 2003; Ruvolo, 2004; Varki & Altheide, 2005; Varki & Nelson, 2007). Ruvolo (2004:515) expands on this and states, "understanding human variation in an evolutionary context, however, requires comparison of human patterns with those of other hominoids, to reveal features shared among hominoids and those unique to humans."

Conclusion

Sequencing the genome of the chimpanzee was certainly a great accomplishment; however, the next step should be the sequencing of the bonobo genome as, not including the former, there is no other creature as close to *H. Sapiens* living on earth today. New research should focus on providing information on how this can facilitate disease treatment in humans. Additionally, further research into bonobos will yield valuable information on the last common ancestor between chimps, humans, and bonobos.

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Bonobo clitorises are larger and more externalized than in most mammals;[55] while the weight of a young adolescent female bonobo "is maybe half" that of a human teenager, she has a clitoris that is "three times bigger than the human equivalent, and visible enough to waggle unmistakably as she walks".[56] In scientific literature, the femaleâ€“female behavior of bonobos pressing genitals.Â genital rubbing, which is the non-human analogue of frotting, engaged in by some human males, two bonobo males hang from a tree limb face-to-face while penis fencing.[54][60] This also may occur when two males rub their penises together while in face-to-face position.Â The Peace Forest Project works with local communities to establish a linked There is quite a bit of research now on the bonobo, which is our gentler, sexier, female-dominated close relative. Genetically, they are exactly equally as close to us as chimpanzees, so there really is no reason to ignore them. Unfortunately, anthropologists have traditionally emphasized warfare, male dominance and violence as the trademarks of human success, and feel uncomfortable with the bonobo. The species is too peaceful for their taste, too hippie-like. Not only are bonobos ignored, they are actively pushed out of the picture. Bonobo - Linked (2019). To favorites 0 Download album. Listen album.Â Songs in album Bonobo - Linked (2019). 1. Bonobo - Linked. 469. 06:10 320 ĎŠĎ±/Ñ.