Joseph Jordania (2006). From the Book: *Who Asked the First Question? The origins of human choral singing, Intelligence, Language and Speech*. Logos Publishing.

# *Singing Rabbit and a Lion Dance: Origin of Rhythm*

The evolutionary cost of singing is quite high. You must be big and strong to habitually afford singing-like loud and long vocalizations (like lions, wolves, whales). There is another option if you are a singing lover – you must be able to fly, like avian birds, or at least, be able to take a quick refuge high on a tree, like gibbons. So, if you are not big and strong, or cannot fly, of quickly escape high into the trees, you'd better shut up and be as quiet as possible if you want to survive. A singing rabbit would not reach an old age.

Living on the trees, our ancestors were on a safer "high floor" of the jungle ecosystem. In the trees you can live according to your weight (are you lighter? – you can live on a "higher floor" or thinner branches and be safe from heavier predators, who can only hunt on "lower floors" or bigger branches). When our ancestors descended from the trees and started walking upright, the situation changed drastically. Animals of all sizes and shapes share the space and struggle for existence on the same "ground level". Colonizing the ground, our ancestors were not big and strong enough to stand against the big predators like lions, and good climbing trees were not always nearby when needed. So, why on earth would they sing? It is clear that singing would **attract** predators.

Steven Mithen criticized Bjorn Merker's idea, who suggested that the foundations of human musical talents were laid when our hominid ancestors started group singing to attract females (Merker, 2000). Mithen argued: "The problem with Merker's ideas is that synchronous calling by hominids in order to attract mates would also attract predators, as would long-distance calls by lone hominids. We know that hominids on the African savanna were competing for carcasses with carnivores, and that they often became the prey themselves. The idea that they would have synchronized their calls to attract wandering females and to deter groups of other hominid males seems most unlikely, especially when the relatively open landscape constrained their ability to escape from predators by climbing trees. A far more likely strategy for such hominids would have been to keep quiet and hope that the prowling carnivores would pass them by (Mithen, 1005:207).

Merker's idea of hominid males calling for females is controversial for another reason as well. Although singing to attract females is quite widespread in the animal world, it does not seem to be the main purpose of hominids prehistoric group singing. In such species, where males try to attract females by their vocal talents (as Merker suggests), singing is mostly used in a **competitive context** between the males (or male groups), and understandably only males usually sing elaborate songs (which is the case in most of the avian birds). Among humans both men and women are ardent singers, and in fact in many regions of the world group singing and vocal polyphony has survived primarily in women's repertoire. This fact strongly suggests that singing must have had a **cooperative** (and not competitive) character in our hominid prehistory. Of course, competition is one of the main driving forces in everything humans do, and singers and choirs in every society do compete with each other in different settings: at village weddings, on pop-charts and during big festivals. But as a phenomenon choral singing must have been born in human prehistory out of **cooperation of the whole group, not competition between the males or male groups**.

Let us go back to our distant ancestors. We have just read Mithen's words about the dangers of group loud singing in African savannah. And still, most likely, hominids continued to sing. Were they trying to attract predators? No. I suggest **they were singing to *avoid* predators**.

Let me explain. For such "singing primates" as we humans are, it is most likely that our distant ancestors started singing quite early. Possibly this was one of the crucial differences that separated our evolutionary line from our closest living relatives, the big African apes of about 6-7 millions of year ago. The open Savanna was not a safe place to encourage singing. So, most likely the singing of our ancestors was already a group business. We do not need to speculate too hard to imagine the singing abilities of our primate ancestors, as for a distant analogy we can use gibbons, whose family "songs" are well-known among scholars and natives of the south-East Asian jungles. It has been suggested that the "singing" of gibbons serves two main purposes: **(1)** to maintain social bonds, and **(2)** to mark their territory from intruders (Geissmann, 2000). Most interestingly for our topic (the origins of choral singing in humans), gibbons "sing" in family duets and trios. The family ensemble consists of the adult couple, sometimes with the offspring joining in as well. Our primate ancestors, most likely, lived in small groups, like chimpanzees and gorillas, so their singing groups could have been a case of an "extended family" ensemble. At that stage, I suggest that group singing was not yet organized rhythmically and was not so different in this regard from other singing birds and animals. The rhythmic precision of human group performance (singing and dancing) is quite an exclusive phenomenon

in the animal world and it seems to have originated when our ancestors moved to the ground. We shall discuss this issue now.

As soon as our ancestors descended from the trees, they faced mortal danger from the big African predators (like lions), who were happy that these silly primates decided to abandon the inaccessible (for them) trees and come closer to them. Continuing loud singing in such a situation, in the kingdom of the lions, and far from the safe trees, seemed like the surest way to a genocidal suicide.

But the big difference was that our ancestors were **singing in groups**. First of all, even just being in groups gives the group members a safety-in-numbers benefit (Hamilton, 1971; Rendall et al., 2000). Besides, if the group members shout together at the attacker, this can have quite a helpful effect for the intended prey. You do not need to see too many horror movies to realise that, confronted by sudden mortal danger, humans usually scream. If you think that this is a fruitless wasting of energy in the face of a danger; think again. Loud screaming and shouting in a situation of sudden mortal danger seems to be an evolutionary strategy for our survival, and it has a double effect: **(1)** an audio-attack on an aggressor and **(2)** a call for help. Many lives were saved by screaming both in the jungles and in the night streets of cities. Interestingly, loud screaming is not an evolutionary strategy for all species – some do not make any noise even when terribly wounded in a violent attack (like wolves), and some pretend they are already dead (capybara).

Screaming by a big group is more effective than individual screaming, and **well-organized loud noise** can stop even the king of the African savannah. We all know about the "beat" method of hunting when the loud shouting and noise of an unarmed human group can scare and direct large and strong animals towards the intended spot, push them over a cliff, or just drive them out of the proximity of human territory. Even today, if a stray lion comes close to an African village, group shouting is the first means of shooing it away.

Despite the immense importance of safety issues in our contemporary western society (where safety standards are the highest in human history), this issue has not been adequately investigated in relation to our distant ancestors (where safety was at the lowest possible level). "Although predation has long been thought to explain the evolution of alarm calls (e.g. Maynard-Smith, 1965) the effect of predation on the evolution of other call types has not been well investigated" (Uster & Zuberbuhler, 2001:742). What I am going to do next is to talk in more detail about the evolution of the "other call type", connected to strategies for safety from predation.

When our ancestors were colonizing the ground, searching for food, or mastering their first stone tools, they could not do this is the safety of well-protected houses, shops and workshops. Any moment of the day they were vulnerable to fatal attacks by big predators. These times are now gone for good, and are apparently forgotten. This must be reason why, although food-searching, hunting and sexual behavior and strategies of hominids and early humans had been among the favorite topics of countless publications, the surviving strategies of our ancestors have not received sufficient attention. At the same time studies of primates show that they spend more time in scanning for predators than in searching for food.

Any tree-dwelling primate is in mortal danger while staying on a ground for some time. They can more easily become prey on the ground. So, as soon as primates notice predators, they rush back into the trees. Our ancestors were in a highly vulnerable situation on the African ground after they moved there. Trees were not around in a moment of danger, and they were not good runners like antelopes, able to outrun predators. Group defence seems to be the only viable option our grandmothers and grandfathers had about some 200.000 generations ago.

Talking about safety measures of our distant relatives, particularly interesting and important in this context is the notion of "well-organized loud noise" I mentioned above. Let us remember what I said a couple of pages ago: although creating elaborate melodies and singing long songs is not only a human prerogative (as I have already mentioned, whales and avian birds can beat us at melodic inventiveness), **group singing with a precise rhythmic pattern, uniting all participants, is a characteristic of human behavior.**

So, I am suggesting that **"rhythmically well-organized loud noise", or the predecessor of human choral singing, was initially established as a safety measure against the big ground predators of the African savannah.**

Safety measures against predation were crucially important for early humans. Unlike us, our ancestors were not "on the top of the food chain", and they had to take very strict measures to survive. Of course, they needed time to stay together as a social group and groom each other, they needed time to find and share food and raise a new generation, but first and foremost they needed vigilance and the right strategy to survive, particularly after they descended from the relatively safe tree branches and started their painful "long and winding road" leading to humanity.

Contemporary studies of monkeys and primates, not conducted in the natural environment, cannot inform us about the crucial importance of the safety measures, but studies conducted in the wild are clear about the paramount importance of strict safety measures. According to Bshary & Noe,

Diana monkeys spend a large proportion of their time scanning for predators (Bshary & Noe, 1997; cited from Uster & Zuberbuhler, 2001:754). Vigilance can be shared across the species as well. According to Wickler, "in some species of babblers, one member of the group remains perched above the ground with the rest of the group feeding below. After some time, the individual is replaced by another group member who will take over the role as the sentinel. Coordination of vigilance is regulated acoustically: about every five seconds the sentinel produces a low-pitched, short range, and difficult to locate call, the watchman's song, which informs others that the individual is watchful and that nothing has happened" (Wickler, 1985; cited from Uster and Zuberbuhler, 2001:754).

It is not difficult to appreciate the rigorous safety measures that most animals use to avoid predators. We all can agree, I hope, that it is much more important not to make mistakes in searching for predators than in searching for food. Of course, it might be frustrating if you have not noticed a good stack of bananas, but if you have not noticed a crouching lion, well, you may never need a banana any more. Besides, most of the animals (including our ancestors) needed food only when they wanted to eat, but they were under the threat of being eaten any moment of the day. That's why most animals look for food for some time of the day, but vigilance against predators is needed all day round.

It has been already mentioned above that scholars have not paid sufficient attention to the effects of predation on the evolution of other than alarm calls, although the crucial importance of safety issues for humans is very well known to all of us. Even today, when we can enjoy unimaginably high standards of safety and longevity (at least in the western world), safety is still the number one priority. We all know that safety concerns are possibly the only real reasons that could make us deliberately give up part of our personal liberties.

Let's go back to our ancestors trying to secure themselves from the lion's claws. As I have already mentioned, I believe that the rhythmic component of human group singing was achieved after the human ancestors descended from the trees. I have a few points to back up this idea:

Kortlandt wrote about the loud display of vocalizations, accompanied by foot-stamping and drumming on tree trunks made by chimpanzee bands as a possible means to scare away predators and competitors, and also suggested that Australopithecines "probably sang and drummed" (Kortlandt, 1973:14). The noise of chimpanzee bands is **not organized in a strict rhythmic unity** for every member of the band.

Descended from the trees to the ground, our ancestors found a very effective new component for their "audio defence" – **stomping on the firm ground**. Even today when we want to scare away something or someone, we often **instinctively stomp on a ground** together with a loud sound and hand gesture. I suggest that this widely spread (and possibly universal for all human societies) behavior is connected to the ancient safety strategy against the major predators of Africa.

There must be something impressive and imposing in the stomping sound itself. Possibly because we all instinctively know that only very large animals can create stomping sounds (the classic scene from "Jurassic Park" of T-Rex's distant stomping making water fizzle comes to mind).

If someone thinks that there is hardly any difference for a marauding predator between the loud and unorganized noise, made by a large group of intended prey, and the loud and rhythmically well-organized sound, think again. The difference is absolutely huge. The loud but unorganized sound, although it can still make a predator hesitate, sounds more like an audio nuisance from panic-stricken prey, but the organized rhythmic sound gives a strong message of well-organized and united resistance. Readers might know from recent history how strong the impact of mass choral singing of "songs of protest" was in the fight against South African apartheid.

Attacks by lions, tigers and other big cats usually take a split second. Prey usually does not even see the attacker, as big cats prefer to attack when the prey is not looking in their direction (that's why cheap plastic masks with human faces, fixed from behind on the head, saved many lives from man-eating tigers in the Sundarbans national park in India and the Bangladesh swamps. See Jackson, 2003:78-80). Of course, during the split second of the attack there is no time to organize a loud and stomping choir to scare the attacker. I suggest that the loud stomping singing-shouting choir would be employed only when the predator was spotted before the attack (and with many eyes this was easier to do). I suggest that with no good trees around, and without very fast legs, the only defence for our ancestors in the face of danger would be to unite as a group in an organized display of unity, stand their ground and scare off the attacker with loud shouting and stomping.

Of course, if the loud sound was only a sound, without any other "materialistic additions", lions would have soon realized that there was not much to be afraid of, but most likely, this loud and well-organized sound was accompanied by the throwing of more materialistic objects (stones, rocks, branches). The suggestion of the evolutionary importance of precise throwing proves very useful in this situation (See Calvin, 1982, 1983, 1993). Therefore, it must have been a combination of both factors that would turn away hungry

lions from non-running groups of stomping and throwing primates, and to go after more "prey-like", although faster running, four-legged preys.

Calvin's suggestion of the evolutionary importance of object throwing as a means of **hunting** does not pay much attention to object throwing as a **defensive** function for our hominid ancestors. Throwing could serve the function not only of reaching a quicker running prey, but also of keeping a predator far from undesirable physical contact with a hominid body. Defence throwing is well known among chimpanzees, trying to "intimidate leopards, snakes, and fellow chimpanzees" (Calvin, 1993:241). Although Calvin himself suggests that "music ought to have so little feedback on natural selection" (Calvin, 1993:240), I suggest that the rhythmically well organized loud stomping group defence, coupled with throwing objects at predators was the main surviving strategy for early hominids.

Some individual members of the group, as in every society, would be braver, and others could be more panic-stricken, particularly when facing a predator like a hungry lion. And here comes another function of the "lion dance": **relentless repetitive rhythm in a dramatic climax of standing your ground for your life against the lion must have had some kind of hypnotic effect on the whole group of stomping primates. This rhythm would unite everyone against the common mortal enemy, giving every member of the group the feel of communal safety.**

If some members of the group were still overtaken by fear and tried to outrun the lion, well, most likely would become the prey. (By the way, experts suggest, that if you are ever attacked by a lion or a tiger, do not run away! This is not the easiest advice to follow in a situation like this, I agree, but they say it helps). So, the lions were themselves eliminating faint-hearted members of the pre-human groups who "did not want to join the choir". Therefore predators were inadvertently helping human ancestors to be more united in a relentless rhythm of the "lion dance".

Human ancestors shared the ground and living space with African lions for at least a couple of million years. Imagine the choir where all the individual members are forced (literally under the fear of death!) to be in perfect unity with the other members of the choir. And imagine the "rehearsals" of this choir occurred almost every day, and continued without stopping for any holidays or school breaks from one generation to another. And another. And another. For more than a million years. And all these millions of years the rehearsals continue under the watchful eyes of hungry lions, and the prize for good synchronous singing is life. I do conduct a couple of choirs. We usually rehearse once a week, trying to get a harmonic and rhythmic unity, and sometimes it is not easy for me to gain everyone's attention… Well, no more dreaming… I guess, if we could hear the "choir" of

our hominid ancestors, the resulting rhythmic (and melodic) precision of our ancestors by the time they mastered stone tools and were ready to move out of Africa, must have been astounding.

I suggest that **the origins of the hypnotic drive of humans to follow the rhythmic pattern of the music with stomping, finger clicking, singing alone or just a rhythmic movement of any part of our body comes from these millions of years of relentless "rehearsals" of our ancestors under the threat of death.**

It is a great feeling when a group of relatively weak creatures can shoo away a big and strong predator like a lion, and it does not take much speculation to imagine that our ancestors would soon transform their effective "lion dance" into a ritual dance.

Therefore, I am suggesting that our distant ancestors used rhythmically precise organized group singing and dancing (initially more of a shouting and stomping) as a survival strategy against predators after they descended from the trees. Although tuneful "family" singing must have been a part of their everyday lives in the trees (like among gibbons today), the relentless rhythmic organization of human singing and dancing must be connected to the ancient hypnotic "lion dance".

William McNeill, American historian from the University of Chicago, the author of the bestseller "The Rise of the West: A History of the Human Community", published an insightful book "Keeping Together in Time: Dance and Drill in Human History", where he gives ample examples of the different human activities when large group of humans find it easy and even exciting to move and do physically demanding exercises, if their movements are precisely rhythmically unified (McNeill, 1995). The powerful influence of long army drill in achieving psychological unity and obedience of the new recruits is also well known to army generals (McNeill, 1995).

The evolutionary psychologist Robin Dunbar proposed that group music-making leads to endorphin surges within the brains of the participants, resulting in their feeling happy and well disposed towards each other (from the 2004 presentation at the conference "Music, Language and Human Evolution". Cited from Mithen, 2005:208-209, note #6 on page 322). "Did you have fun?" was the question usually asked of participants in collective working on the maize fields in western Georgia, working that was always accompanied by the singing of special *Naduri* songs (Tsuladze, 1971:21). Carl Bucher gives plenty of examples of the magic power of united rhythmic singing for making the process of hard work easier (Bucher, 1923 [1919]) .

Large groups of chimpanzees sometimes conduct an awe-inspiring performance including vocalizations and other stamping and drumming

sounds. What is also very interesting is that they often organize this kind of "concert" at dusk, before going to sleep. A precise rhythmically organized and intimidating "lion dance" could have been used routinely by our hominid ancestors in the evenings to scare away the night predators. It has been noticed, that "African natives who live in the bush do much the same at nightfall organizing a loud sound display" (Kortlandt, 1973:14). Scholars sometimes portray our ancestors singing at their camp of an evening (Livingstone, 1973; Mithen, 2005). Singing and drumming for safety during the night gives another meaning to these idyllic evening "concerts". Loud singing and rhythmic stomping could fulfill evolutionarily very important safety function.

This is not the whole story. I suggest that defence was not the only function of the loud and intimidating "lion dance". Would a group of hominids use the powerful audio display not only for defence, but for attack and intimidation as well? I mean would they, for example, try to chase away a lion (or even lions) from the lion's kill? We should not be too skeptical about this "crazy bravery" of our ancestors. It is documented that an unarmed and shouting group of humans can chase away the hungry man-eating tiger from its kill. Hunter and conservationist, my childhood hero Jim Corbett gives a few such examples in his documentary books about man-eating tigers (Corbett, 1946). Therefore, the possibility of big group of hominids intimidating lions with the rhythmic "lion dance" seems quite possible. At least, in the desperate situation of being without food for the group for several days hominids could have been pushed to organize such an attack. I can easily visualize how the starving hominids would watch lions hunting, then they would give the lions some time to feed (if they did not want to deal with *very hungry* lions) and then they could start their rhythmic attack for their share of the remaining carcass. "Tell me how hungry you are and I can tell you what you could do". The near proximity of death from starvation can radically alter human behavior. Educated and civilized humans were pushed to massed cannibalism in Leningrad by total starvation during the Second World War, when Stalin categorically refused to give up the city of Lenin to the Nazis. I remember meeting a distant relative from Leningrad in the first half of the 1980s, and remember my shock when on my simple question "Do you have a grandmother?" she simply answered "No. She was eaten by her neighbors in Leningrad".

As a matter of fact, this kind of "aggressive scavenging" (or "confrontational scavenging", according to Robert Blumenschine, 1986) behavior could be the main source of obtaining meat for our hominid ancestors. It would not be too far-fetched to hypothesize that even a very few successful attempts by starving hominids to drive away lions from the

remainder of the kill would be enough for smart hominids to realize the "attacking power" of the "lion dance", and to encourage them to use this strategy to obtain meat in other cases as well, not only in cases of absolutely extreme starvation.

Binford suggested that scavenging was the main strategy for our distant ancestors to obtain the much-needed meat (Binford, 1985). The "hunting versus scavenging" discussion already has a long tradition. My suggestion of "aggressive scavenging" changes the nature of scavenging, because killing a rabbit or antelope is not more difficult than chasing lions away from their kill. By the way, lions themselves are well known to use intimidation to shoo away smaller predators and to scavenge their kill. So my model supports Binford's very interesting suggestion.

Another potentially very interesting line of research that I am not going to follow in this book is the obvious link between the **stomping behavior** of our ancestors and hominid **bipedalism** that started in the African savannah. It is not difficult to imagine that hundreds of thousands and even millions of years of vigorous stomping could help to transform the somewhat awkward "lower hands", which were better prepared to climb trees, into the flat organs that were well adjusted to carry our ancestors for many kilometres each day, and also to make good stomping sounds to secure their families from predators and even obtain a food.

The killing of human ancestors by lions and other predators of Africa must have still not been very rare, no question about that. Caught off guard, or alone, our ancestors were not a match for the lion's fangs and claws. But together these hominid groups were a force to be reckoned with even for a hungry lion. Hundreds of thousands and millions of years passed in this evolutionary struggle for survival in the African savannah, shaping our sense of unity and rhythm.

Zygmunt Estreicher made a much-cited comparison about the "in-built metronome" in the heads of African musicians in his remarkable study of rhythms among the Bororo tribes (Estreicher, 1964). A sense of rhythm is one of the musical universals that unite the human race, and it is interesting that it seems to be particularly precise among sub-Saharan African populations. Pygmies are hailed as the best drummers and dancers by sub-Saharan Africans themselves (see the discussion of Pygmy polyphony in the first part of this book), so the undersized populations of Central African rainforests arguably have the strongest sense of rhythm among the human populations of our planet.

Drumming and drums are usually (and most likely correctly) identified as the first type of musical instrument humans used in the course of

their musical evolution (after the most natural instrument – their own voice). There is something deep and symbolic in this suggestion that the first drum our hominid ancestors used was the earth itself, and the first drumming (stomping) started as a means of group unification and group defence against the large African predators that humans faced on the ground.

We should not discount the possibility that the first human-made musical instruments (arguably drums) were initially made and used as a very effective means of making a louder noise to increase the safety of the night camp.

If we have a look at the characteristics of the musical culture of sub-Saharan Africans, arguably the best-preserved polyphonic tradition of our planet, and at our hypothetical reconstruction of "primordial polyphony" (see above), we can see that **(1)** they both have a 4/4 rhythmic basis (ideal for stomping), **(2)** they both are almost always connected to vigorous movements, **(3)** stomping is often one of the main elements of their dances **(4)** singing is often loud, and **(5)** the melodic phrases are often very short, consisting of precisely coordinated two-three-sound energetic phrases. All of the mentioned characteristics fit very well the requirements for the "lion dance" of our hominid ancestors.

This long struggle for survival and safety measures must have been a powerful drive for our ancestors to live in **bigger groups.** Bigger groups meant not only more eyes to see the predators and more fighters, but more singers, louder stamping and a generally louder sound for the "lion dance".

Scholars suggest that the bigger size of hominid groups must have been one of the most important factors leading to the development of more complex social interactions and the increase of human mental capacities (Aiello & Dunbar 1993; Dunbar, 1996; Byrne & Whiten, 1988, 1992).

The same long struggle for survival against African predators could have been one of the key factors in the **gradual increase of the body size** of the individual members of the group as well. If life on tree branches favored smaller and lighter individuals (who could easily move through the trees and could escape leopard-like predators on higher branches), moving down to the ground, where unlike the tree branches, different "weight categories" live side by side on the same level, favored bigger individuals who could not only shout louder, but were physically stronger as well.

And finally, I would like to propose that the origin of human rhythm might provide an evolutionarily background for future human language, as a pulsating and flowing rhythm must have prepared the appearance of both human music and language. Neurologically this suggestion makes good sense, as human rhythm is mostly located in our left hemisphere, and in the

light of the very early origins of rhythm, it could have played an instrumental role in transforming the primate ancestor of the Broca structure into a human neurological basis for the human language.

So, according to the suggested model, after our ancestors descended from the trees, there were a few simple alternatives for them to follow:

(1) To stop "irresponsible" singing, grow bigger teeth and learn fast running for their lives;

(2) To go back to the safe tree branches, and

(3) To create bigger size groups and defend themselves as a group.

According to the evolutionary results, human ancestors did not stop singing, did not grow bigger teeth, did not become great runners to outrun lions, and did not go back to the trees. We will never know the number of failed attempts in pursuing any of these options during the millions of years of evolution, but according to the final result, those who opted for closer contacts between the group members, increasing the group size, cooperation and more effective means of group defence, were favored by evolution. The rest, as they say, is history.