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A Female Bonobo Sleeping on the Ground after Daytime Birth and its Implications

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INTRODUCTION

Reduction of predation risk is thought to be one of the main benefits that animals derive from living in a group (Alexander 1974) and a major driving force in the evolution of group-living in primates (Hill & Lee 1998).



Figure 1. Ot with her newborn infant (OS) on the ground. Ok and Fa looking at OS. Fk lying about 2 m from the other three and looking back at human observers.

For bonobos and chimpanzees, the combined effects of large body size and group living may mean that predation risk is relatively low compared with many other primate species, but some reports have suggested that lions and leopards can have a heavy impact on them (Boesch 1991; Tsukahara 1993; D'Amour *et al.* 2006). Among chimpanzees there is an additional risk from conspecific killing, which is probably responsible for deaths of more infants and adults than predation itself (Williams *et al.* 2008).

Although they are closely related, bonobos are quite different from chimpanzees in terms of conspecific aggression and female–female relationships (Furuichi 2011). Neither direct evidence of infanticide nor conspecific killing has been observed in wild bonobos. Female chimpanzees are less tolerant and compete with each other for local resources, probably as a means to increase their reproductive success (Pusey & Schroepfer-Walker 2013). Female bonobos, on the other hand, often engage in affiliative interactions such as grooming and homosexual interactions called genito-genital rubbing (Kuroda 1980; Ryu *et al.* 2015) and may support each other in response to aggression from males (Tokuyama & Furuichi 2016). Female bonobos keep this high sociality even during one's parturition (Douglas 2014). This friendly social environment appears to influence many behavioral characteristics of female bonobos.

Here I report a case of a prime parous female bonobo giving birth in the daytime at Wamba in the Luo Scientific Reserve, Democratic Republic of the Congo. The subject female, called Otomi (Ot) gave birth on a daybed on April 5th, 2015. After giving birth, Ot came down to the ground and fell asleep while her nearest neighbor Fuku (Fk) was sitting about 2 m from her. I will discuss how tolerant and supportive group characteristics can be related with behavioral characteristics of female bonobos compared with that of female chimpanzees.

METHODS AND BACKGROUND

E1 group was originally one of the two subunits of E group which had been habituated by 1976 (Furuichi *et al.* 2012). Since then, E1 group has been studied for over 40 years at Wamba, with a break of 6 years from 1996 to 2002 because of the civil war in DR Congo. When researchers resumed the field study in 2002, all members of E1 had been re-identified and no artificial provisioning has been conducted since that time (Furuichi *et al.* 2012).

I followed E1 group from dawn to dusk (bed to bed) with two field assistants. We recorded all occurrences of rare behaviors, such as aggression and copulation, as well as membership of the party every hour using the 1-hour party method (Hashimoto *et al.* 2001).

Otomi (Ot) was one of two females that immigrated into E1 from an adjacent group in 2008, at which time she was estimated to be 11 years old (Sakamaki *et al.* 2015). Ot successfully gave birth to her first offspring in January 2011, and it was named Otoko (Ok; ♀). Ok had grown up and become an independent individual by 2015. Ot had a still-birth in March 2014 when Ok was 3 years and 2 months old. Ot became pregnant again 5 months after the still-birth. This time Ot successfully gave birth on April 5, 2015, and this offspring was named Osamu (OS; ♂).

Two months prior to Ot's immigration, another immigrant female Fuku (Fk) joined E1 group. Fk also gave a birth in January 2011, and her offspring was named Fua (Fa; ♀). The relationship between Ot and Fk was stable and strong in 2015 when the observations in this report were made.

OBSERVATIONS

At 05:31–06:00 h, April 5th, 2015, Ot was found without newborn infant at the bed site. E1 group moved into the secondary forest, where Musanga trees (*Musanga cecropioides*) are most abundant.

At 07:45 h, Ot stayed in a daybed and I could not detect any particular movement nor vocalization (focal sam-

pling). The only other daybed in the same tree was Ok's, (about 2 m distance). Two more daybeds were around at 7 m from Ot's bed (individuals in them were not identified). I left the place at 08:05 h when the focal sampling was over.

At 08:45–08:50 h, Ot urinated on the daybed, and left. The urine found on the leaves of shrubs below included some drops of blood. Ot was carrying a newborn infant (OS) with umbilical cord (around 5 cm) still attached. Ot moved into a bushy place and lay on the ground. Ok followed Ot.

At 08:51–09:22 h, Fk and Fa appeared at the place where Ot and Ok were. Fk stopped about 2 m from Ot. Fa and Ok approached within arm's reach of Ot to see OS (Figure 1, Video 1 available online at [http://mahale.main.jp/PAN/24_2/24\(2\)_01.html](http://mahale.main.jp/PAN/24_2/24(2)_01.html)). Ot sometimes shoed them away when they got too close to OS (Figure 2). Fk was watching Ot from about 2 m away and did not get closer. While taking a rest on the ground, Ot fell asleep and tried to open her eyes (Figure 3 and Video 1). I left with the trackers to avoid disturbing them anymore.

Ot and her two offspring were then absent from the group until April 13, 2015 (8 days). TN (an adult male; over 40 years old) was also missing from 7th to 13th and it may be that TN ranged with Ot and her two offspring.

DISCUSSION

After giving birth, a bonobo mother might be expected to experience sleepiness, as shown in the current report. However, sleeping on the ground will increase the risk of being attacked by predators or conspecific individuals. Therefore, it is hard to imagine that a female of a solitary primate species could fall asleep on the ground with a newborn infant. This might be also true for a female living in an intolerant social environment, such as that of chimpanzees. Female chimpanzees increase vigilance and self-directed behaviors when there are more members in

close proximity (Kutsukake 2003, 2006). Moreover, other conspecifics can seriously harm one's newborn infant in chimpanzees (Goodall 1977; Nishie & Nakamura 2018). However, if the risk of predation or harmful contact by conspecifics is very low, females might not need to maintain a high level of vigilance while they are with other group members as described in the current report.

Female bonobos maintain close social relationships with each other and support one another in agonistic interactions. These close social relationships and agonistic support enable females to maintain high social status as they are able to counter any attempts by males to dominate them (Parish 1996; Tokuyama & Furuichi 2016). The current report is in line with these findings. If a female bonobo with other group members can benefit from their protection from predation and conspecific harassment, the need for maintaining vigilance will be low. Douglas (2014) also suggested that females get benefit of protection and relief from others during the parturition. Therefore, the cohesive grouping pattern and tolerant female–female relationship might be the medium that makes female bonobos relaxed, even at times when they are relatively vulnerable, such as immediately postpartum.

The presence of human observers is unlikely to have been a cause of Ot's post-partum sleeping. Even though bonobos of E1 group are well habituated, when human observers accidentally get too close to bonobos (within about 5 m), they usually move away from the human observers. Females are particularly sensitive to accidental approaches by human observers. Therefore, it seems most likely that the presence of Fk and the stable relationship between them facilitated post-partum sleeping by Ot. It is unlikely that Fk had tracked Ot's movements until she gave birth. However, given that frequent proximity and affiliative interactions between Ot and Fk, Fk was most likely to be the individual whom Ot would encounter for the first time after giving birth.



Figure 2. Ot pushing Ok away from the newborn infant, OS.



Figure 3. Ot has fallen asleep on the ground with her newborn infant (OS), while Fk, Ok, Fa stay around her within 2 m.

Nishie & Nakamura (2018) suggested that the temporal leaving of females after giving birth functions as “maternity leave” in chimpanzees to avoid the risk of infanticide. In the current study group (E1), females with newborn infants also range for one to two weeks alone, or only with their other offspring, immediately after giving birth. However, after one or two weeks, females usually join a party and range with group members. This is probably because the mother with a newborn infant can find fruiting trees and avoid predation risk more efficiently by ranging with other group members. Together with the fact that no infanticide has ever been reported in bonobos, the temporal leaving of female bonobos after parturition is more likely related with the cost of ranging with other group members rather than the risk of infanticide.

The tolerant group characteristics of bonobos might also allow female bonobos to exploit the benefit of group living more than female chimpanzees can do. This highlights the impact that social environment can have on behavioral characteristics of females. Further comparative studies on difference of behavioral characteristics of the two *Pan* species will not only help us to understand the *Pan* species, but may also improve our understanding of how social characteristics of various human societies influence well-being and behavioral characteristics of the individuals in them.

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<NOTE>

Lonoa: The Establishment of a Permanent Field Site for Behavioural Research on Bonobos in the Kokolopori Bonobo Reserve

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The Kokolopori Bonobo Reserve was officially established by the Democratic Republic of the Congo (DRC) government in May 2009 as a community-based nature reserve encompassing over 4,850 km² (Almquist *et al.* 2010; Figures 1 and 2). Locally initiated and managed, it harbors a large population of bonobos, who are and

have been traditionally protected by a taboo of the local Bongando people against hunting them (Lingomo & Kimura 2009). The management of the reserve is conducted by the local population and the conservation initiative “Vie Sauvage” (VS), supported by the Bonobo Conservation Initiative (BCI).

Efforts to follow bonobos in the northern part of the reserve, near the village of Yetee, were initiated in 2005 by VS and BCI, which had been committed to establishing longitudinal research on bonobos and had commenced ongoing support of local people to track the Ekalakala bonobo community (Figure 2). In 2010, the tracking extended to a second, neighboring bonobo community, Nkokoalongo. Until 2016, both communities had been followed on a more or less regular schedule, but were subject to only a limited amount of formal scientific work. Dr. Alex Georgiev did some work in the ranging area of the Ekalakala community, collecting fecal samples during 2006 and 2007. These samples were included in a number of publications on malaria and micro biome (Liu *et al.* 2010; Liu *et al.* 2014; Ahuka-Mundeké *et al.* 2016; Moeller *et al.* 2016; Wroblewski *et al.* 2017). Dr. Deborah Moore commenced behavioural ecological research at the site in 2014 with the intention of establishing a longitudinal study, but unfortunately was curtailed after 4 months. During her stay, she reorganized the habituation procedure for both communities and made some initial behavioural observations, including an incidence of maternal cannibalism (Tokuyama *et al.* 2017).

After MS’s reconnaissance trip in 2015, he established a permanent research camp named after the nearby river, Lonoa (N0.41716°, E22.97552°), in the beginning of 2016 with the help of the Max Planck Institute, VS and BCI. The camp is situated approximately 4 km from the nearest village, Yetee (Figure 1). A network of existing paths and standardized transects allows access to an area of 50 km², which comprises large parts of the ranges of the two habituated bonobo communities. The study area consists mainly of primary heterogeneous forest with very few swampy areas. The bonobos of the Ekalakala community also range occasionally in secondary forests close to the local settlements. An initial botanical survey to describe the forest types and composition has been con-

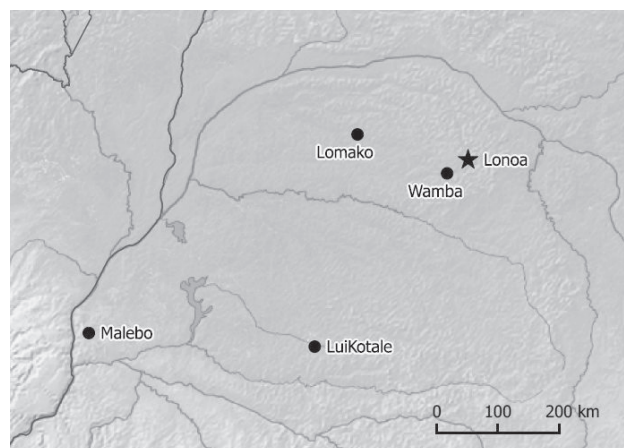


Figure 1. Active bonobo research sites with at least semi-habituated bonobo communities.