

## BRIEF REPORT

# Fellatio in Captive Brown Bears: Evidence of Long-Term Effects of Suckling Deprivation?

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Sexually stimulating behaviors that are not linked to reproduction are rare among non-human (especially non-primate) mammals. Such behaviors may have a function in the hierarchy of social species. In solitary species, such behaviors are more enigmatic, and possibly indicative of something abnormal. Here, we report on a case of two male brown bears, raised in captivity since being orphaned as cubs, which engaged in recurrent fellatio multiple times per day until at least 10 years old. The roles of provider and receiver in the act remained unchanged, and the behavior itself became highly ritualized. The provider always initiated the contact involving vigorous penile sucking that appeared to result in ejaculation. We suggest that the behavior began as a result of early deprivation of maternal suckling, and persisted through life, possibly because it remained satisfying for both individuals. This constitutes the first descriptive report of fellatio in bears, and suggests that some bears may suffer lifelong behavioral consequences from being orphaned at an early age. Zoo Biol. XX:XX–XX, 2014. © 2014 Wiley Periodicals, Inc.

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## INTRODUCTION

Fellatio (i.e., the oral stimulation of the penis by a partner) has been observed in mammals other than humans [Bagemihl, 1999], both in captivity and in the wild. It is considered non-reproductive sexual behavior [Bagemihl, 1999; Sommer and Vasey, 2006], possibly an abnormality [Anderson, Arun, and Jensen, 2010]. Bagemihl [1999] described fellatio and auto-fellatio (self-stimulation) in primates, spotted hyenas *Crocuta crocuta*, goats *Capra hircus*, and sheep *Ovis aries*. The behaviors involved penile sucking (e.g., bonobos *Pan paniscus*), licking (e.g., Dall sheep *Ovis dalli*), or both [Bagemihl, 1999], sometimes together with mounting [e.g., stump-tail macaques *Macaca arctoides*; Chevalier-Skolnikoff, 1976].

The evolutionary significance of fellatio is still questioned. In bonobos, oral stimulation serves a social function [Bagemihl, 1999; de Waal, 1995]. In wild cheetahs *Acinonyx jubatus* and lions *Panthera leo*, females lick and rub a male

partner's genitals as a part of courtship [Bagemihl, 1999]. Tan et al. [2009] suggested that fellatio in the short-nosed fruit bat *Cynopterus sphinx* prolongs copulation, which may increase the likelihood of successful fertilization.

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The brown bear *Ursus arctos*, a solitary species outside the seasonal breeding season (late spring–early summer), has a polygamous mating system that includes male–male competition and female mate choice [Steyaert et al., 2012]. Mating involves mounting from behind, accompanied by neck bites [Ludlow, 1974]. Other behaviors to stimulate the genitals have been observed, both in wild and captive bears. Male brown bears and American black bears *Ursus americanus* may lick the partner's vulva during sexual activities [Bagemihl, 1999]. In captivity, masturbation may be prompted by frustrated sexual motivation [Maas, 2000] from endocrine activity and lack of a sexual partner [Ishikawa et al., 2003]. Anderson, Arun, and Jensen [2010] described masturbation with auto-fellatio in captive sloth bears *Melursus ursinus*, and interpreted it as abnormal/stereotypic behavior. Bauer et al. [2013] observed that a male sloth bear masturbated only in the presence of a favorite female companion. Auto-fellatio has also been observed in a captive male brown bear in Zagreb Zoo (Croatia) that was orphaned as a cub. This behavior ceased when this bear was merged with females [Davorka Maljković, pers. comm., March 30, 2013]. Both fellatio and auto-fellatio have been observed among captive bears living in substandard conditions with inadequate behavioral stimulation [Else Poulsen, pers. comm., April 30, 2013]. Here, we report the first observations of long-term, recurrent fellatio in captive brown bears kept in proper conditions after being orphaned, provide a detailed description of the acts, and examine its social and life history context to gain an understanding of the drivers of this behavior.

## METHODS

The subjects of this study, two unrelated male brown bears, were born in the wild in 2003 and orphaned as cubs. Both cubs were observed alone, and for a time were provided food from a dish by local people. Eventually, both were taken into captivity, the first one in May and the other in June 2003, and then raised together in a semi-natural enclosure (~1,790 m<sup>2</sup>) at a sanctuary for brown bears in Kuterevo, Croatia. Neither of the cubs was ever bottle-fed. The individual receiving fellatio was larger than the providing individual when found as cubs, and remained so as adults. Both males were castrated in April 2005. A male–female sibling pair, raised in captivity (Zagreb Zoo, Croatia) by the mother until 1.5 years old was transferred to the sanctuary and placed in an adjacent enclosure in early summer 2008 (both castrated in 2009). All four bears were merged into a larger, semi-natural enclosure (~3,850 m<sup>2</sup>) in October 2010. This facility provided ample space and enrichment opportunities for the bears.

Acts of fellatio were recorded during seven visits to the sanctuary, encompassing 19 days over 6 years (May 2008, April 2009, April 2010, November 2011, May 2012, March 2013, and June 2013). During these visits, we continuously observed the bears [Martin and Bateson, 1993]

for an average of 6.5 hr/day and documented behaviors with video recordings and photographs.

## RESULTS

We observed 28 acts of fellatio between the two male bears in 116 hr of observation (averaging one act per 4.2 observation hr; range: 0.2–24 hr). Nine acts occurred in various bushes that were abundant in the enclosure, 2 in the open central area, and 17 at three preferred spots along the fence. The acts occurred during all our visits, which were spread across the seasons (except when the bears were denning, late December–mid February), and at various times of the day, but mainly (60.7%) during 06:00–12:00. The roles of the two male bears, one as provider and the other as receiver of the fellatio, did not change over the 6 years of observation. Also, neither of these bears engaged in any sexual behavior with the other two bears in the enclosure, which were sexually mature in the later years of the study (6 years old in 2013).

We used 20 fully recorded fellatio acts to examine the behavior (Fig. 1). All cases appeared to be initiated by the provider, who approached the receiver while he was resting on his side (35%) or with part of his abdomen exposed (65%). If the receiver's genitals were not exposed, the provider would push his head into the pelvic region or use his paws to separate the hind legs. After accessing and initial licking of the penis, the provider would find a more comfortable posture, such as sitting or lying sternally. Once actual sucking started, neither bear changed position. Sucking lasted an average of  $168 \pm 44.6$  (SD) sec (range 66–223 sec), and often was accompanied by humming vocalizations by the provider (clearly audible during 18 acts). In cases where both individuals were clearly visible to the observer (18 acts), the receiver appeared to experience orgasm, evidenced by muscular contractions. A foamy white liquid around the muzzle of the provider was visible in each case, which may have been ejaculate, saliva, or both fluids mixed. At that point, the receiver either pushed away the provider with his hind legs or turned away. In all cases, the receiver remained lying at or near the spot and in eight cases (40%) the provider laid down next to the receiver, with no further active interactions.

## DISCUSSION

Sexual reward appears to be an important motivation for genital stimulation in many species [Bagemihl, 1999]. The association of the two bears in this study may have been reinforced by the pleasant properties of fellatio combined with attraction to the specific partner, leading to pair bonding via conditioned reward learning [Young and Wang, 2004]. Repetitive releases of the hormone oxytocin during sexual stimulation may play a role in strengthening social bonds [Lim and Young, 2006]. Pleasurable benefits must have accrued to both the receiver as well as the provider for the



Fig. 1. Selected frames from the footage of the fellatio behavior in the brown bear males: (a) the individual providing fellatio approaching the other individual resting on side, (b)–(d) phases of fellatio.

behavior to have persisted so long and repeated so often, with the roles fixed since this behavior was first recorded opportunistically in 2004, when both bears were 1.7 years old (Ivan Crnković Pavenka, pers. comm.).

The motivation for fellatio by the provider seems less obvious than for the receiver, yet in our study the provider was always the instigator. We suggest that the behavior may have started as a consequence of prematurely curtailed maternal suckling when these bears were orphaned as cubs. Brown bear cubs suckle their mother for milk, bonding, and comfort for at least the first year of their life [Dahle and Swenson, 2003]. Orphaned bear cubs may suck their own or their sibling's body parts, such as paws or ears, as a substitute for their mother's nipples [Burghardt and Burghardt, 1972; Loeffler, Robinson, and Cochrane, 2009]. They may even suckle body parts of a human caregiver [Kilham and Gray, 2002]. Anderson, Arun, and Jensen [2010] observed auto-sucking of the genitals by sloth bears at a rescue center in India that housed former dancing bears which had been taken from their wild mothers as young cubs, and deprived of maternal contact [Seshamani and Satyanarayan, 1997; D'Cruze et al., 2011]. Forced early-weaning and subsequent deprivation of proper and sufficient stimulation of the suckling reflex can result in teat-searching behavior persisting into adulthood, for example, belly nosing in domesticated pigs *Sus scrofa* [Widowski et al., 2003], or cross-sucking in artificially reared calves *Bos taurus* housed in groups separated from their mothers [Jensen, 2003]. In the case reported here, the provider may have found a substitute for teat-sucking that also resulted in a let-down of substitute "milk." Notably, this animal emitted the same humming sound used by suckling bear cubs, thought to be linked to

milk let-down and to signal the cub's comfort and contentment either to the mother or to itself [Peters, Owen, and Rogers, 2007], suggesting that this bear retained infantile behavior. The fact that this behavior persisted so long, remained one-sided, was not influenced by the presence of a female bear, and did not result in or reflect any other obvious social hierarchy among the two bears makes this case particularly interesting. Both bears were deprived of maternal care so it remains unclear why only one of them desired more suckling. Although this situation may in part be an artifact of captivity, it raises the intriguing question as to whether wild bears that become orphaned while still nursing may sometimes suffer lifelong behavioral problems, even if they are capable of living in the wild without their mother.

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## REFERENCES

- Anderson C, Arun AS, Jensen P. 2010. Habituation to environmental enrichment in captive sloth bears—effect on stereotypies. *Zoo Biol* 29: 705–714.
- Bagemihl B. 1999. *Biological exuberance: animal homosexuality and natural diversity*. New York: St. Martin's Press. 751 p.
- Bauer E, Babitz M, Boedeker N, Hellmuth H. 2013. Approaches to understanding and managing pacing in sloth bears in a zoological setting. *Int J Comp Psychol* 26:53–74.

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- Burghardt GM, Burghardt LS. 1972. Notes on the behavioral development of two female black bear cubs: the first eight months. *Int Conf Bear Res Manage* 2:207–220.
- Chevalier-Skolnikoff S. 1976. Homosexual behavior in a laboratory group of stumptail monkeys (*Macaca arctoides*): forms, contexts, and possible social functions. *Arch Sex Behav* 5:511–527.
- Dahle B, Swenson JE. 2003. Factors influencing length of maternal care in brown bears (*Ursus arctos*) and its effect on offspring. *Behav Ecol Sociobiol* 54:352–358.
- D’Cruze N, Kumar Sarma U, Mookerjee A, et al. 2011. Dancing bears in India: a sloth bear status report. *Ursus* 22:99–105.
- de Waal FBM. 1995. Bonobo sex and society: the behavior of a close relative challenges assumptions about male supremacy in human evolution. *Sci Am* 272:82–88.
- Ishikawa A, Sakamoto H, Katagiri S, Takahashi Y. 2003. Changes in sexual behavior and fecal steroid hormone concentrations during the breeding season in female Hokkaido brown bears (*Ursus arctos yesoensis*) under captive conditions. *J Vet Med Sci* 65:99–102.
- Jensen MB. 2003. The effects of feeding method, milk allowance and social factors on milk feeding behaviour and cross-sucking in group housed dairy calves. *Appl Anim Behav Sci* 80:191–206.
- Kilham B, Gray E. 2002. Among the bears. Raising orphaned cubs in the wild. New York: Holt and Co. 304 p.
- Lim MM, Young LJ. 2006. Neuropeptidergic regulation of affiliative behavior and social bonding in animals. *Horm Behav* 50:506–517.
- Loeffler IK, Robinson J, Cochrane G. 2009. Compromised health and welfare of bears farmed for bile in China. *Anim Welfare* 18:225–235.
- Ludlow JC. 1974. Observations on the breeding of captive black bears, *Ursus americanus*. *Int Conf Bear Res Manage* 3:65–69.
- Maas B. 2000. The veterinary, behavioural and welfare implications of bear farming in Asia. London: World Society for the Protection of Animals. 68 p.
- Martin P, Bateson P. 1993. Measuring behaviour. An introductory guide, 2nd edition. Cambridge: Cambridge University Press. 186 p.
- Peters G, Owen M, Rogers L. 2007. Humming in bears: a peculiar sustained mammalian vocalization. *Acta Theriol* 52:379–389.
- Seshamani G, Satyanarayan K. 1997. The dancing bears of India. London: The World Society for the Protection of Animals.
- Sommer V, Vasey PL. 2006. Homosexual behaviour in animals/an evolutionary perspective. New York: Cambridge University Press. 382 p.
- Steyaert SMJG, Endrestøl A, Hackländer K, Swenson JE, Zedrosser A. 2012. The mating system of the brown bear *Ursus arctos*. *Mammal Rev* 42: 12–34.
- Tan M, Jones G, Zhu G, et al. 2009. Fellatio by fruit bats prolongs copulation time. *PLoS ONE* 4:e7595. doi: 10.1371/journal.pone.0007595
- Widowski TM, Cottrell T, Dewey CE, Friendship RM. 2003. Observation of piglet-directed behaviour: patterns and skin lesions in eleven swine herds. *J Swine Health Prod* 11:181–185.
- Young LJ, Wang Z. 2004. The neurobiology of pair bonding. *Nat Neurosci* 7:1048–1054.