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Self-Injurious Behavior of a Captive *Coragyps atratus*

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ABSTRACT: As zoos become more numerous the challenge for keepers to ensure animal well-being and identify adverse behaviors becomes immense. Intelligent animals in captivity have a higher likelihood of participating in selfharm activities compared to their wild counterparts. Feather picking in birds is one such adverse behavior characterized by the individual breaking or removing feathers and, in severe cases, excision of the skin. This behavior increases the susceptibility to sickness and infection. In this study, a feather-picking captive Black Vulture (*Coragyps atratus*) was observed preening, resting, and displaying self-mutilating behavior. Collected data were compared with a second non-mutilating specimen. The feather-picking animal was an imprinted education animal while the non-feather picker was a non-imprinted display bird. The featherpicking vulture was medicated with Gabapentin, a drug typically used for neuropathy with anecdotal evidence for treatment of self-mutilation in birds. In addition, this bird was briefly housed adjacent to a Crested Caracara (*Caracara cheriway*) as a potential remedy for feather picking. From the results of this study, a recommendation is made to mitigate this alarming behavior by adjacent or near exhibition with a similar bird.

KEYWORDS: black vulture; *Coragyps atratus*; self; mutilating; injurious; feather; picking; crested caracara; captivity

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INTRODUCTION

The American Black Vulture, or *Coragyps atratus*, was first formally described by Johann Bechstein in 1793 with the species name “atratus” meaning “clothed in black” (Holloway, 2003). Today, the International Union for Conservation of Nature classifies *Coragyps atratus* as a species of least concern with increasing populations throughout the southern United States through Central America to southern South America (International, 2016). *Coragyps atratus* is a scavenger, acting as nature’s cleanup crew by ingesting deceased animals that may be too decomposed for other scavengers. Moreover, *Coragyps atratus* is a New World vulture, meaning they lack a syrinx, and vocalizations are reduced to two sounds: hissing and woofing.

Feather picking is a multi-factorial damaging behavior most commonly observed in captive Psittacine birds (Costa et al., 2016). Feather picking is a self-injurious behavior where the bird removes feathers, and in severe cases, excoriates the skin (Grindlinger, 1991). This maladaptive behavior gives opportunities for infections, and birds may also damage blood feathers, which are notoriously hard to stanch. Gabapentin is a medication used for the treatment of neuropathy in birds. Anecdotal evidence also suggests that Gabapentin can be used to prevent feather picking. The use of Gabapentin is relatively new for treating self-injurious behavior, but no studies have been made to observe its behavioral effects on *Coragyps atratus*. Studies of Gabapentin’s effect on other birds of prey have been conducted for neuropathy and pain management (Yaw et al., 2015), but were not informative for its efficacy in treating feather picking, thus observation of a feather picking raptor on Gabapentin may yield promising data. Comparing the two *Coragyps atratus*’ environments and most common habits may lead to a more effective solution for reducing self-mutilation behavior. Self-injurious feather picking has never been observed in the wild for *Coragyps atratus*.

MATERIALS, METHODS, AND STUDY SPECIMENS

Lurch is an eleven-year-old male *Coragyps atratus* housed at the Central Florida Zoo. He was found as a healthy chick and brought to a rehabilitation center. Lurch imprinted onto humans during the rearing process. Imprinting is a consequence of human interaction that occurs during early development in a bird’s life and is an irreversible process that affects bird behavior socially and sexually. Such imprinting can be so severe that the

bird is unable to recognize a potential mate from its own species (Immelmann, 1972). Typically, imprinted birds cannot be released back to the wild, for risk of isolation from other members of its species (Slagsvold, Hansen, Johannessen, & Liffield, 2002). This form of imprinting enabled Lurch to be less aggressive towards keepers and have a propensity to learn basic commands.

Lurch was initially placed at Silver Springs Zoo and was used as a show bird. The show schedule ensured that he flew twice a day. At night he was kept inside an enclosed building. In 2013, the Silver Springs Zoo closed and Lurch was moved to the Central Florida Zoo in Sanford, Florida. According to his keepers, he was initially used as an “animal ambassador” in both shows and education programs. After a year at Central Florida Zoo, Lurch began feather picking. The feather picking reportedly began in 2014, during the Thanksgiving holiday, when staff visitation with the animals may have been less frequent. Shortly after he began feather picking, aviculturists made the decision to discontinue his participation in shows and programs due to the extent of his injuries. A study on Lurch completed in 2017 concluded that the self-harm was a product of contingent anthropomorphic attention (Morris, 2017). Lurch self mutilated more frequently when keepers provided attention. Topical ointments, blocking devices, and increased enrichment were used in an attempt to curtail the self-mutilation with little success. This study aims to observe other possible solutions to the self-mutilation.

Lurch’s enclosure is a 2.5 meter deep by 3 meter wide by 2 meter high chain link cage. Within the enclosure, a 1 meter x 1 meter wooden mew is located in the back left of his enclosure for roosting and sleeping. The sleeping mew is necessary to prevent predatory local wildlife from reaching in through the chain linked enclosure to attack the bird. Lurch is put into his sleeping mew before 5 PM and let out into the chain link portion of the enclosure after 8 AM daily.

Within the larger enclosure, large bare oak branches are used as perches. Perch locations are changed frequently for extra stimulation. Additional enrichment is provided in the form of toys, such as plastic balls with holes hung from branches, smaller balls on the ground, and cardboard boxes stuffed with paper towel rolls. A fan blows air into the enclosure from the back, which includes a 1 meter by 8 meter metal sheet for rain protection. The floor of the enclosure consists of mulch with patches of grass. A safety

cage is located adjacent to the enclosure and is also made of chain link fencing. Lurch's enclosure is surrounded on three sides by other enclosures and an assortment of birds and mammals. The front of Lurch's enclosure is a grassy area and a fence separating the keeper area from the public. Groups of children and guests are sometimes escorted through the area by a keeper or educator.

A second *Coragyps atratus*, Jeff, was also observed for comparison. Jeff was admitted to the Audubon Center for Birds of Prey as a mature bird in September 1995 with a fractured, misaligned right femur and fractured left humerus (Scott, 2010). It was assumed that Jeff was a male bird; however, in March 2008, Jeff laid an egg. Jeff has been a display animal for the Audubon center since October 1995.

Jeff's enclosure is a 3.6 meter by 3.6 meter square. The entire back of the enclosure consists of vertical oak planks separated from one another by less than 3 centimeters. The back half of the roof is solid wood for rain protection. The front half of the roof and other three sides of the enclosure is a fine fencing with 2 centimeter by 2 centimeter mesh providing good visibility to the viewing public. A brick wall is behind Jeff's enclosure with a grassy area to the right and to the front with a pathway winding past the front area. To the left of Jeff's enclosure, two *C. cheriway* and one Turkey Vulture (*Cathartes aura*) are housed. Jeff's enclosure has a sand substrate with a small fern growing near the in-ground water basin.

Lurch is fed a small food item, typically a mouse, in the morning after he is let out of his sleeping mew and is fed a larger meal in the evening shortly before he is moved into his sleeping mew. This schedule enables the administration of the 1 milliliter of Gabapentin twice a day. Jeff is fed once in the evening and is given .08 milliliter of Cosequin on Mondays for treatment of stiff joints, as she is an older bird. Jeff was given enrichment in the form of leather rings with durable plastic balls and tennis shoes. Food was occasionally hidden inside paper towel rolls. Both *Coragyps atratus* ate their food quickly and frequently finished their portions of food.

The study location for Lurch was in Sanford, Florida at Central Florida Zoo and Botanical Gardens in a staff only area. Jeff was observed in Maitland, Florida from a public area at Audubon Center for Birds of Prey. The observer was positioned 2 meters from both enclosures. Initially, Lurch was observed three days a week, but this

was reduced to one day a week, due to the addition of the other specimen, Jeff. Observations of Lurch and Jeff were one day a week with the observation beginning before noon and typically lasting six hours.

In Florida, *Coragyps atratus* are sympatric with *C. cheriway*. Allopreening between the two species have also been observed in the wild with both participants eliciting preening from one another (Ng & Jaspersen, 1984). Halfway through the study, Lurch was placed adjacent to a female *C. cheriway* for three days and one morning. This female *C. cheriway*, named Cheriway, was admitted to the Audubon Center for Birds of Prey as an immature emaciated bird with a fractured left humerus (Scott, 2010). She stayed at the center for two years until she was transferred to Central Florida Zoo and was incorporated with their King Vulture (*Sarcoramphus papa*) enclosure. The *S. papa* were loaned to a New Orleans Zoo, and Cheriway was moved to a back area.

The two birds at Central Florida Zoo, *Coragyps atratus* and *C. cheriway*, were placed in adjacent enclosures for three full days and one morning. The adjacent enclosure was 1.5 meter by 3 meter by 3 meter fencing with 2 centimeter by 2 centimeter mesh. The only divide between them was an extension of the fencing and a closed sliding door constructed from the same fencing material. The ground was concrete, and perches consisted of bare oak branches. Other enclosures were visible, including those for Red Shoulder Hawk (*Buteo lineatus*), Red Tail Hawk (*Buteo jamaicensis*), Harris Hawk (*Parabuteo unicinctus*), Hyacinth Macaws (*Anodorhynchus hyacinthinus*), and a Serval (*Leptailurus serval*). Within earshot was an Amur Leopard (*Panthera pardus orientalis*) that would call occasionally. These enclosures were on two sides of the adjacent enclosure. The other two sides consisted of a parking lot with the keeper building and a grassy bamboo area where the observer sat. Lurch was able to see the keeper building from his new enclosure and very frequently watched the keepers enter and exit the building.

On the fourth day of proximal habitation with Cheriway the *C. cheriway*, keepers opened the sliding door between the two and fighting occurred within a few minutes. As a result, Lurch the *Coragyps atratus* was moved back to his old enclosure shortly after.

Time spent for each behavior was recorded and these data were entered into a Microsoft Excel spreadsheet on a laptop. Longer times were recorded with a Galaxy

S5 stopwatch. The spreadsheet divided the observation period into five-minute increments. This procedure allowed for better organization of the recorded data and the ability to generate time sensitive charts. Observations continued as long as the weather permitted. (Both facilities discouraged observations during inclement weather.) Directional information of the enclosure location is recorded from the observer's point of view. Specific bodily locations of the subject birds were made from the bird's point of view.

Feather picking was defined as any contact of the beak to the problem area. This behavior was only observed with Lurch at the Central Florida Zoo. The problem area was the left scapular, clavicle, and coracoid, in combination with the leading edge of the left wing in the humerus area, as shown in Figure 1. Preening is defined as manipulative beak-to-feather contact on any other part of the body. Rarely was preening observed without feather picking accompanying it. Resting is defined as anytime the rump or body of the specimen was on the ground, surface, or perch. This resting behavior did not include incubation or broody behavior, which was observed in both *Coragyps atratus*. Keepers at both facilities are defined as any staff within view or earshot of the enclosure. Both *Coragyps atratus* responded more strongly with keepers they're more familiar with. Lurch was observed for 15 days for a total of 96 hours and 25 minutes, while Jeff was observed for 8 days for a total of 32 hours and 5 minutes.

In this study, statistical variance was calculated for each examined characteristic for Lurch and Jeff. Using the calculated variances in combination with the averages for that characteristic, a two tailed z-test was performed in Microsoft Excel to measure statistical significance of the observed behaviors.



Figure 1: Lurch pausing between bouts of feather picking.

RESULTS AND DISCUSSION

Despite a daily dose of Gabapentin during the first meal at 9 AM and again at dinner near 4 PM, Lurch's feather picking was largely undiminished during the non-adjacency periods of the study in his solitary enclosure (Figure 2, $p = 0.2687$). During the initial days of observation, Lurch had a lower frequency of feather picking, possibly because the observer was learning to gauge the extent of his problem area and the subject was becoming accustomed to the observer's presence.

Lurch's self-mutilation experienced a drop, despite keepers being present, when he was in the enclosure adjacent to the *C. cheriway* (Figure 2). There was a statistically significant change in the amount of feather picking from his previous enclosure and during the enclosure adjacency with the *C. cheriway* ($p = 0.0466$). A statistically significant change in feather picking was also observed between the enclosure adjacency with *C. cheriway* and his return to his old enclosure ($p = 0.00002$). During the adjacent enclosure environment, Lurch showed a lot of interest in the *C. cheriway*, though the latter bird did not show much interest in Lurch. Droppings from the nights before showed that *C. cheriway* and *Coragyps atratus* roosted as close as 1 meter to one another.

While alone in his chainlinked enclosure, Lurch spent 3.2% of his time engaged in self-injurious behavior. After the introduction of the *C. cheriway* into the adjacent enclosure, this percentage dropped to 0.70%. After the two birds were separated, the time spent feather picking increased to 8%. An explanation for the decreased rates during the initial observations may be the observer's less experienced recording of feather picking behavior, but differences in feather picking were still significant. Lurch self-mutilated within his chainlinked enclosure with keepers present the most, which concurs with the study completed the previous year (Morris, 2017).

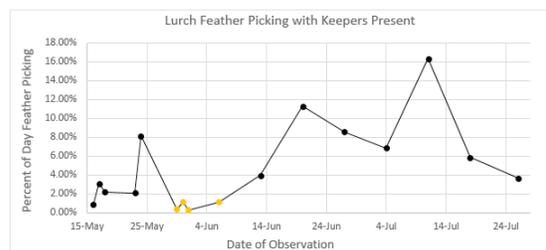


Figure 2: Lurch feather picking with keepers present. Gold points indicate days *Coragyps atratus* was adjacent to *C. cheriway*.

Jeff rested significantly less daily than Lurch (Figure 3, $p < 0.00001$). A common side effect of Gabapentin is drowsiness, which may explain the exceptional duration of Lurch's resting. A linear regression was added to the data and Lurch increased his resting throughout the day whereas the amount of time devoted to rest by Jeff was constant throughout the day. Jeff's resting was sporadic and brief during her observations, while Lurch's resting was seemingly high between 11:00 AM to 3:30 PM.

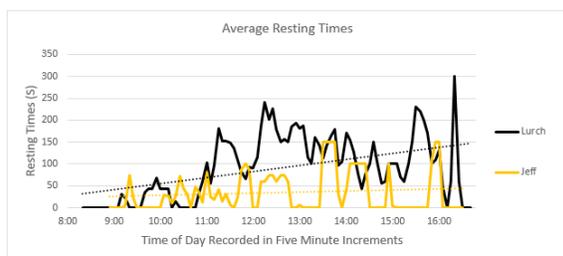


Figure 3: Average resting times over a day for both *Coragyps atratus* with dotted linear regression ($p < 0.000001$).

On days when Lurch was administered Gabapentin, his rest appeared to increase 2 hours after initial treatment. Parrots experience a mild sedation after the administration of Gabapentin, with the half-life of Gabapentin in Amazon parrots recorded as 4.5 hours (Baine, Jones, Cox, & Martín-Jiménez, 2015). Here, it seems the sedative effect showed a similar decrease at 4.5 hours.

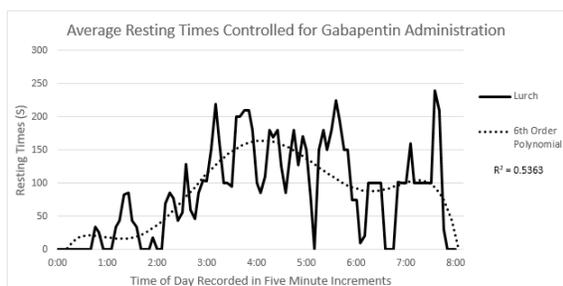


Figure 4: Lurch's typical resting with equal Gabapentin medication administration.

Jeff preened for longer periods of time compared to Lurch (Figure 5, $p < 0.00001$). Lurch frequently switched between feather picking and preening and would divide time between the two activities. Percent of time spent preening differed in all phases as Lurch's environment changed. Average preening before the move was 5.9% and remained the same during the adjacent enclosure time at 5.5%. Upon separation, the amount of time spent

preening rose to 9%. Both feather picking and preening rose to higher averages after the separation of *Coragyps atratus* and *C. cheriway*.

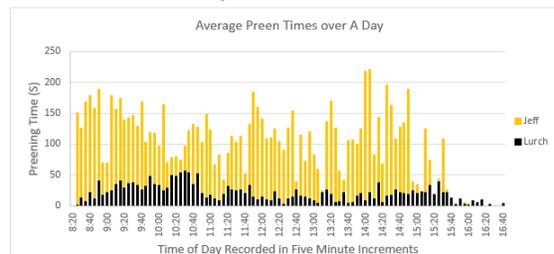


Figure 5: Average preening times over a day for both *Coragyps atratus* ($p < 0.00001$)

Jeff's preening was her only feather manipulation activity. The observer totaled Lurch's preening and feather picking activity and compared it to Jeff's only manipulative activity, as shown in Figure 6. Lurch was not only preening less than Jeff (Figure 5), but he was also spending less time on feather manipulative behavior in general, approximately 20% less time than Jeff. This result may be an unintended side effect of the Gabapentin. The medication is aimed to reduce self injurious activity but may inadvertently reduce normal preening behavior. This outcome was further reinforced with Lurch's extraordinary resting time (Figure 3).

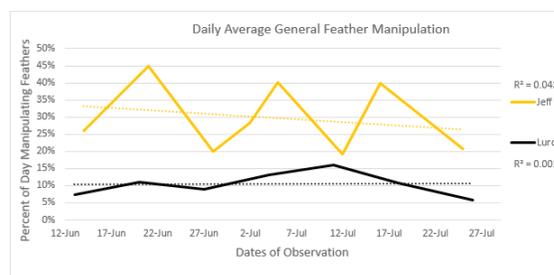


Figure 6: Total average feather manipulation of Jeff and Lurch.

FUTURE WORK

Keepers at the Central Florida Zoo are developing a vest as an alternate blocking device for Lurch. Unfortunately, blocking devices alone only work temporarily and the bird returns to old habits upon removal of the device (Grindlinger, 1991). Keepers hope that the vest will enable Lurch to participate in public appearances and, therefore, increase his daily enrichment, which may result in decreased feather picking. Feather picking was rarely observed during flight training sessions, which may translate to less feather picking during a rigorous show

schedule.

The bird team at the Central Florida Zoo is also considering placing Lurch back into an adjacent enclosure to an American Crow (*Corvus brachyrhynchos*). While this pairing is not typical, the stimulation of a nearby similar bird may be productive as seen in a 1951 study where cooperative behavior was observed between a captive Raven (*Corvus corax*) and a *Coragyps atratus* with a *C. corax* purposely placing bits of meat outside of its enclosure and a *Coragyps atratus* descending from a nearby tree to devour the meat (Malcolm, 1952).

CONCLUSION

Over the course of the study, a medicated *Coragyps atratus* exhibiting featherpicking behavior was observed at the Central Florida Zoo. Preening frequency and resting times were recorded over several days while environmental events were noted. When compared with observations of a non-feather picking *Coragyps atratus* in captivity, several key differences were found. Among them is that the non-feather picking *Coragyps atratus* rested less than the feather picking *Coragyps atratus*. Resting averages were stagnant for the duration of the day for the non-feather picker while the feather picking bird's average resting increased throughout the day. The feather picking *Coragyps atratus* also manipulated feathers, preening or feather picking, 20% less than the control *Coragyps atratus*.

The feather picker was administered Gabapentin twice daily, resulting in side effects including drowsiness, which may have influenced resting times. If another solution were found to mitigate the self-destructive behavior, Gabapentin would not be required, which would save the facility money and free up staff time for other tasks. The only occasion where self-mutilation was interrupted was during the adjacent enclosure with a *C. cheriway*. Full integration into a single enclosure may not be possible, but the socialization and familiarity of another similar conspecific may have helped reduce the anthropomorphic induced feather-picking seen in the *Coragyps atratus* at the Central Florida Zoo.

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REFERENCES

- Baine, K., Jones, M. P., Cox, S., & Martín-Jiménez, T. (2015). Pharmacokinetics of Compounded Intravenous and Oral Gabapentin in Hispaniolan Amazon Parrots (*Amazona ventralis*). *Journal of Avian Medicine and Surgery*, 29(3), 165-173. doi:10.1647/2014-025
- Costa, P., Macchi, E., Tomassone, L., Ricceri, F., Bollo, E., Scaglione, F. E., . . . Schiavone, A. (2016). Feather picking in pet parrots: sensitive species, risk factor and ethological evidence. *Italian Journal of Animal Science*, 15(3), 473-480. doi:10.1080/1828051X.2016.1195711
- Grindlinger, H. M. (1991). Compulsive feather picking in birds. *Archives of General Psychiatry*, 48(9), 857-857. doi:10.1001/archpsyc.1991.01810330081012
- Holloway, J. E. (2003). *Dictionary of Birds of the United States: Scientific and Common Names*: Timber Press.
- Immelmann, K. (1972). Sexual and Other Long-Term Aspects of Imprinting in Birds and Other Species. In D. S. Lehrman, R. A. Hinde, & E. Shaw (Eds.), *Advances in the Study of Behavior* (Vol. 4, pp. 147-174): Academic Press.
- International, B. (2016). *Coragyps Atratus*. *The IUCN Red List of Threatened Species*. doi:http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22697624A93624950.en.
- Larivière, Serge. "Ursus americanus." *Mammalian Species* (2001): 1-11.
- Laurie, A. M. (1981). Black Vulture Nesting, Behavior, and Growth. *The Auk*, 98(1), 182-185.
- Malcolm, D. (1952). Captive Raven Carries Food to Non-Captive Black Vulture. *The Auk*(2), 201.
- Morris, K. L. (2017). Functional Analysis and Treatment of Self-Injurious Feather Plucking in a Black Vulture (*Coragyps atratus*) *Rollins College Rollins Scholarship Online*, https://scholarship.rollins.edu/mabacs_thesis/1/.

11. Ng, D., & Jaspersen, B. D. (1984). Interspecific Allopreening between Crested Caracara and Black Vulture. *The Condor*, 86(2), 214-215. doi:10.2307/1367047
12. Scott, D. D. (2010). Raptormed. Retrieved from <http://www.raptormed.com/summary.html>
13. Slagsvold, T., Hansen, B. T., Johannessen, L. E., & Lifjeld, J. T. (2002). Mate choice and imprinting in birds studied by cross-fostering in the wild. *Proceedings of the Royal Society B: Biological Sciences*, 269(1499), 1449-1455. doi:10.1098/rspb.2002.2045
14. Yaw, T. J., Zaffarano, B. A., Gall, A., Olds, J. E., Wulf, L., Papastavros, E., & Coetzee, J. F. (2015). PHARMACOKINETIC PROPERTIES OF A SINGLE ADMINISTRATION OF ORAL GABAPENTIN IN THE GREAT HORNED OWL (BUBO VIRGINIANUS). *Journal of Zoo and Wildlife Medicine*, 46(3), 547-552. doi:10.1638/2015-0018.1