

Managing Aggression in Captive Chimpanzee (*Pan troglodytes*) Populations: a new understanding of their needs

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Introduction

When attempting to keep non-human primates (NHP) in captivity, a deep understanding of their requirements is paramount. This is made more difficult, but perhaps more important, in a species such as chimpanzees, who have a dynamic social group and are particularly powerful animals capable of harming each other severely, even fatally, both in the wild and in captivity (Ross *et al.*, 2009). As chimpanzees in captivity cannot choose with whom they share their environment, nor can they leave voluntarily, intragroup aggression can be a serious problem (Ross *et al.*, 2010). While aggression is “a natural part of the behavioural repertoire” of chimpanzees, the onus is on the managers of captive populations to minimise the severity and frequency of injuries in their population (Williams *et al.*, 2010). This can be achieved in zoological settings through the appropriate social groupings (Ross *et al.*, 2009), keeping long-term stability in the group (Williams *et al.*, 2010) and through positive reinforcement training (PRT) (Pomerantz & Terkel, 2009).

Discussion

Prior to the widespread acceptance of the chimpanzee Species Survival Plan (SSP) in the mid 1990s, it was the norm in North America to house chimpanzees in single adult male harems by removing male offspring at adolescence (Ross *et al.*, 2009). The SSP encouraged zoos to change to more naturalistic social groupings of multiple adult males and multiple adult females, which brought new challenges in terms of managing intragroup aggression. As young males progress through puberty they can become the source of group tension. Ross *et al.*, (2009) studied the influence of adolescent males on the rate of wounds that occur within the group. Their study was large, comprising 39 stable groups totalling 299 chimpanzees across 38 North American facilities. Surprisingly, they found that the rate of wounding was no higher in groups containing adolescent males and that adolescent males were no more likely to be the perpetrators of aggression than any other age group. However, they showed that while the rate of wounding was not different, adolescent males became the target of aggression, and received a disproportionate number of wounds compared to other age groups (Ross *et al.*, 2009).

The other important finding made by Ross *et al.* (2009) was that chimpanzees housed in groups containing a single adult male had a significantly higher rate of wounding than groups with multiple adult males. This finding is supported by Williams *et al.* (2010), who studied wounding rates by looking at retrospective data kept by the Primate Foundation of Arizona. They analysed individual health records kept on file for the previous 10 years completed by veterinarians following any wounding event. They found that wounding frequency decreased the longer the group had been a stable unit. The introduction of a new member to the group increased the wounding events, further stipulating that males who are taken out of their natal groups at adolescence will have problems later on when they are introduced either to a new group or back to their natal group after they have reached adulthood.

Williams *et al.*, (2010) showed that in terms of predicting wounding risk, it is more important to look at the overall gender balance in the group, rather than focus on an individual of one gender. They found that all male groups had the highest rate of wounding, followed by groups with a single adult male, with multiple adult male and female groups showing the fewest wounding events.

Williams *et al.* (2010) suggested that managers should use active measures to reduce group tension. This has been studied by Pomerantz and Terkel (2009), who looked at the effect of Positive Reinforcement Training (PRT) in captive chimpanzee populations. Their study was

relatively small, with a sample of just 12 chimpanzees housed at the Tel Aviv-Ramat Gan Zoological Centre in Israel. The researchers grouped chimpanzee behaviours into “abnormal”, which included regurgitation and reingestion, “stress-related”, which included self-grooming, and “prosocial”, which included social grooming. The experiment was conducted in three stages: the baseline stage where no training took place, then two experimental stages. The first of the experimental stages involved 6 chimpanzees. They were trained using operant conditioning principles to present certain body parts to the keepers. All 6 chimpanzees were kept in the same cage, but only one animal interacted with the trainers at a time. The other chimpanzees were positively reinforced not to interfere. During the final experimental stage, also of 10 weeks’ duration, the original 6 chimpanzees continued their training and the other 6 chimpanzees began the same training program. In the end, 6 chimpanzees had 10 weeks of PRT and the other 6 had 20 weeks.

After the training had finished, the researchers noted a significant decrease in abnormal and stress-related behaviours and a significant increase in prosocial behaviours. Even though the PRT was used solely to train the chimpanzees to present body parts, and only occurred in their indoor holding areas in the morning, the positive behavioural changes were seen in the exhibit area and throughout the day. This shows that PRT can induce a general behaviour change. Interestingly, the degree of change in behaviour depended on the individual animal. It was found that low-ranking chimpanzees showed a more marked positive change in their behaviour, compared to the higher-ranking chimpanzees. This has important implications, as it means that PRT could specifically benefit adolescent males that become the target of aggression as they navigate their way to maturity.

Conclusion

We are beginning to understand the social needs of captive chimpanzees in greater detail. We now know that keeping social groups of multiple adult males and females is the ideal situation. This can be difficult, as adolescent males become the target of aggression and may sustain more wounds than usual. However, it has been shown that long-term stability of the social group is very important in reducing overall wounding rates, so if at all possible, adolescent males should be kept in their natal group. PRT may be able to help with this, by improving the psychological welfare of the adolescent males.

References

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