

The influence of social behaviours of gorillas in captivity on the maintenance of all-male groups in the long-term

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Introduction

A rise in male population numbers of western lowland gorillas (*Gorilla gorilla gorilla*) in captivity in the 1980s, and an increase in the formation of captive single-male and multi-female groups, have prompted efforts to preserve their genetic diversity (Stoinski et al., 2004a), including the restriction of natural reproduction to avoid over- or under- representation of certain traits expressed in the limited gene pool (Pope et al., 1997). For any polygynous species, the issue of housing is therefore a problem. With a limited number of females in captivity, the formation of all-male groups would be an ideal solution (Stoinski et al., 2004a). Issues regarding the social cohesion of such a group and nutritional needs of gorillas in general form the focus of this report.

Discussion

Stoinski et al. (2004b) investigated the social dynamics of 25 male western lowland gorillas living in nine captive all-male units at seven different zoos, examining the factors involved in successfully keeping an all-male group intact in the long term.

Hand-reared gorillas showed fewer affiliative behaviours, although both mother- and hand-reared animals initiated affiliative and other social behaviours with similar frequencies to one another. Sub-adults (<11 years) were seen to spend more time in close proximity with other animals and to initiate interaction more often than the blackbacks (11-13 years) or silverbacks (>14 years). Older animals were generally higher in the dominance hierarchy, although in one group with a hand-reared mature gorilla, a younger animal was in charge. Sub-adults displayed the least amount of aggressive behaviours and were more involved in non-contact aggression than contact aggression, an activity in which the older animals were more involved (Stoinski et al. 2004b). Early familiarity and relatedness were found to have no major effect on affiliative interactions. There was evidence that females created a destabilizing effect on male relationships, in that male animals with visual/olfactory access to female gorillas exhibited more hostility towards one another than those without a female member (Stoinski et al. 2004b).

Focusing on nine areas in another study, Stoinski et al. (2004a) compiled data from a range of sources and looked at the many factors influencing the formation and maintenance of an all-male group. As in the first study, Stoinski et al. (2004a) noted that inclusion of non-breeding males in a mixed adult group resulted in increased aggression and wounding, again stressing the detrimental effect of the female presence to the long-term survival of the group (Stoinski et al. 2004b). Solitary housing as an option was investigated, but it was found to cause too much stress to the animal. This finding may reflect the inadequacy of resources provided to the individual, as solitary housing was not part of the normal captive gorilla curriculum. Additionally, solitary males in captivity could still be aware of other gorillas via their senses, and this could possibly cause frustration (Stoinski et al. 2004a).

Hand-reared members were found to display much fewer affiliative behaviours when compared with the mother-reared animals, as in the earlier study, suggesting that the method of rearing could influence the success of integration (Stoinski et al. 2004a; Stoinski et al. 2004b). Age-based similarities to the earlier report in terms of more affiliative and fewer aggressive behaviours being displayed by immature gorillas were noted (Stoinski et al., 2004b). However, as the merging of adult males into a group was also observed, it was suggested that personality could affect the compatibility of certain partners. Further research revealed that a group containing members of similar ages could be easier to manage than one with varying levels of maturity, as younger members in mixed-age groups might eventually fight for dominance (Stoinski et al. 2004a).

Contradicting to their earlier report, Stoinski et al. (2004a) stated that related male animals appeared to get along better with one another than with other unrelated males, and proposed that early familiarity could be beneficial. Captive groups containing a maximum of three members worked best, and to enhance the social cohesion in confined enclosures, a number of exhibit considerations, including refuges for more submissive animals, an interesting environment with enriching material, and plenty of space without places where they could be trapped were recommended (Stoinski et al. 2004a).

In a different study, addressing the quality of captive diets, Remis and Dierenfeld (2004) set up an experimental procedure to determine the digestibility of the diets fed to gorillas in captivity with the aims of reducing regurgitation and reingestion and formulating a better diet. Six gorillas (three adult females, two adult males and one immature) were used in the first phase, during which they were fed their usual diet of fruits, vegetables and scattered browse. The two adult males were removed prior to the second phase because of a respiratory illness, and the remaining animals were given a diet higher in fibre with reduced browse. Total intake, regurgitation and reingestion, as well as elimination and digestion were measured for each gorilla.

The diet higher in fibre took longer to travel through the gut and the animals appeared to be able to digest and utilize fibre components well. It was also noted that regurgitation and reingestion occurred more often with their original diet than in association with the new diet. Many captive diets lack the amount of fibre ingested in the wild, which could influence behavioural and digestive patterns. A high-fibre, less kilojoule-dense diet and hence, longer periods of digestion, could lead to the improvement of health and increased levels of satisfaction and satiation, resulting in the reduced frequency of regurgitation and reingestion, could all be benefits derived from the provision of a diet mimicking that found in the wild (Remis and Dierenfeld, 2004).

Conclusion

Age, group size, rearing history, presence of females, housing conditions, group composition, personality, relatedness and early familiarity can influence the long-term success of an affiliative all-male group and hence, quality of life in captivity. Further studies should be carried out to gain a better understanding of the factors highlighted above, and their implications in management. Additionally, the formulation of a suitable diet in captivity to improve their standard of living, which could affect both the health and behaviour of captive gorillas, warrants further research.

References

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