
central positions in the grooming network. However, males employ a different grooming strategy than females, since they tend to focus their grooming on a subset of group members, while females distribute their grooming more equally among group members. Our results also stress the importance of mother-rearing for the proper development of social skills. Especially in atypically-reared males, popularity in the grooming network appears to be impacted, which can be explained by the importance of maternal support and mother-son bonds in bonobos. Our study is one of the first to investigate individual variation in social network position in bonobos, and also one of the first social network studies to compile multiple groups into one large dataset, making the results more representative and reliable for bonobos as a species.

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The effect of long-term visitor deprivation on patterns of behaviour in captive Chilean flamingos (*Phoenicopterus chilensis*) and greater flamingos (*Phoenicopterus roseus*)

The influence of visitor presence within zoological enclosures is widely documented, with effects varying between species, individuals, and enclosures. Typically during visitor studies, behavioural responses to increasing levels of visitor numbers are measured. During these studies visitors are consistently present during observation. Alternatively, blocking studies observe species behaviour when visitors are present and compare these results to when visitors are prevented from entering the species enclosure (or entire zoo). However, current blocking studies have been limited to short intermittent periods of blocking where subjects are provided opportunities to re-habituate with humans between observations. COVID-19 lockdown restrictions on UK zoological institutions presented a unique opportunity to observe captive flamingo behaviour without the presence of visitors over a long and consistent period of time, followed by the reintroduction of visitors to the enclosure and wider zoo when restrictions were lifted. Photographic data were collected from Banham Zoo, Norfolk and African Alive, Suffolk from 24.06.20 to 30.06.20 during zoo closure, and from 01.07.20 to 08.07.20 during zoo reopening (excluding the date of 05.07.20). Data was collected at three time points, consistent across each day of observation. Generalized linear mixed models will be used to assess differences in activity and enclosure usage between observations during closure and reopening whilst accounting for climatic factors. We hypothesise that captive flamingos, previously habituated to humans, will exhibit behavioural alterations in response to visitors after long-term zoo closures (negative or positive effect); or that the flamingos habituation to visitors persists over the blocking period and mitigates behavioural alterations (neutral effect). Our results have important implications for ex-situ conservation programmes, such as captive-breeding for release, due to the extensive habituation to humans in these settings. Our findings also have the potential to inform flamingo husbandry guidelines during zoo closures.

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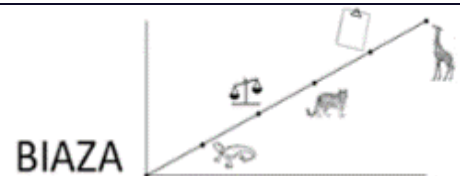
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Body Condition Scoring and activity levels of Southern white rhinoceros (*Ceratotherium simum simum*)

Southern white rhinoceros (*Ceratotherium simum ssp. simum*) can be prone to carrying excessive weight in captivity with obesity often leading to foot and joint damage or decreased reproductive success. As a threatened species, captive breeding programmes are crucial to conservation success, and so efforts should be made wherever possible to improve reproductive health. The reason for high body condition scores within the species remain undetermined, although evidence suggests links to diet or activity level. In order to assess potential causes of weight gain in rhinos, a study held at Knowsley Safari Park assessed body condition, behaviour, social preference and enclosure use of seven white rhino. Data were collected from September to December 2020, with 2 hour biweekly observations split between the two groups for AM and PM observation sessions. Continuous observations were conducted simultaneously, in addition to instantaneous sampling of enclosure location, and frequency of social interactions. While no significant relationship ($P > 0.05$) was found between activity level and body condition, findings suggested social preferences between individuals, with relevant behaviours. Enclosure use varied most significantly with sex and age ($P < 0.05$) with behavioural analysis showing similar results. The eldest females displayed the least active behaviours and used the smallest amount of enclosure space, while males and juvenile females were significantly more active and social ($P < 0.05$). Further research using a larger study sample and over a longer timescale is planned to be able to more accurately determine relationships between behaviour and body condition, as these study subjects were found to have relatively similar condition scores.

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