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Spatial and social influences on the behaviour of captive chimpanzees

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Abstract

Captive animals are frequently subject to imposed, uncontrollable stressors to which they respond through behavioural flexibility, or, failing which, exhibit pathology. Chimpanzees provide an intriguing model to examine how captive environments influence the responses of animals to stress. My study investigates the responses of a group of chimpanzees to imposed stressors of captivity at the Johannesburg Zoo, South Africa. My study comprised four components. Firstly, I examined the effects of spatial restriction on chimpanzee behaviour with regard to an enclosure enlargement, testing several existing models of coping with spatial crowding and another model, based on the coping hypothesis of abnormal behaviour. Behavioural observations of the chimpanzees in their indoor and outdoor exhibits before, during, immediately after and 10 weeks after the enclosure reconstruction revealed that the chimpanzees used tension-reduction and conflict-avoidance tactics as a means to cope with spatial crowding. Moreover, abnormal behaviour appears to provide an outlet for stress under crowding. Secondly, I assessed the long-term effects of past spatial environments on the space use and group spacing of the chimpanzees, five years after the enclosure change. Through behavioural observations and mapping the locations of individuals, I found that the chimpanzees exhibit space-use bias and limited group spacing, contingent on the dimensions of the old enclosure that were not explained by factors such as social or thermal conditions and zoo visitor effects. I propose that the spacing patterns may be due to spatial learned helplessness. Thirdly, I examined the effect of two social manipulations, mandated by zoo management, on the behaviour and socio-dynamics of the chimpanzees. The chimpanzees responded to social change through selective social interactions and non-social behavioural responses suggest that removing an individual was less stressful than the merging of two groups. Finally, I investigated the role of shade as a thermoregulatory resource for captive chimpanzees. Individuals used shade frequently despite observations taking place during the austral winter period, suggesting that shade is a valuable thermal resource for chimpanzees. In conclusion, the chimpanzees responded to most imposed stressors (spatial crowding, social change and thermal stress) through behavioural flexibility, implying successful coping, but failed to cope with previous spatial restrictions, resulting in limited space-use behaviour.