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*Examination of enrichment using space and food for African elephants (*Loxodonta africana*) at the San Diego Zoo Safari Park*

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Abstract

*Concern for elephant welfare in zoological facilities has prompted a number of exhibit and management modifications, including those involving enrichment. Knowledge of how these changes impact indicators of welfare, such as elephant movement and behaviour, is crucial for continued improvement of elephant husbandry and care. The present study used observations and GPS-collected data to determine the effects of available space and food presentation on the walking distance and behaviour of thirteen African elephants (*Loxodonta africana*), which had a dominance structure ascertained by animal care staff at the San Diego Zoo Safari Park (SDZSP). This facility has two exhibits of approximately equal size. Three treatments were created to assess the effects of food and space enrichment: (i) access to half of the exhibit with food (Half); (ii) access to the entire exhibit with food in one yard (Both/Half); and (iii) access to the entire exhibit with food in both yards (Both). For Half and Both/Half, food was presented in each yard for an equal number of trials. Significant differences across treatments were revealed for average total walking distances but this was not found between any two given treatments. Walking distance varied among elephants belonging to different dominance groups, with middle-ranked elephants taking the most advantage of a larger available space. Behaviour did not differ across treatments, but the change in behavioural diversity from one treatment to another was significant for subordinate elephants. The information obtained from this study has direct implications for the management of the SDZSP elephants and for other facilities looking to increase walking distance or subordinate behavioural diversity.*

Keywords: *African elephant, animal behaviour, animal welfare, enrichment, GPS technology, zoo studies*