

Sentience and senescence in an elephant herd

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We struggle as humans to understand our own actions. How can we begin to understand and provide possible interpretations for the actions of other species? Yet elephants have recently been acknowledged as 'sentient' beings in the National Norms and Standards for the Management of Elephants in South Africa according to which '.....interventions to manage an elephant should seek to minimise any resultant pain or trauma to the elephant'¹.

'Sentience' refers to an ability to feel or be aware of feelings². But how has science assisted us to arrive at such an abstract conclusion? To name but a few

of the latest findings: Not only are elephants capable of engaging in effective tool-use³ but they have also passed the mirror self-recognition test as have apes and dolphins⁴. Elephants' brains have a relatively large hippocampus compared to primates which may explain their long social and chemical memories⁵. Consequently they can keep track spatially of where other individuals are relative to themselves⁶ and it has even been shown that elephants can classify subgroups of humans that pose different degrees of danger⁷. Humans still represent the biggest threat to elephants and their stress hormone responses to particular human activities (hunting, immobilisation, translocation or tourism) have successfully been quantified^{8,9}. Elephants are known to exhibit concern for deceased individuals or to offer assistance to conspecifics in distress¹⁰. Research has shown us that elephants show higher levels of interest in elephant skulls and ivory than in other natural objects¹¹. We now know that the oldest individuals in a group have enhanced social discrimination and consequently function as important repositories of social knowledge¹². Gradually it has become permissible to talk about elephant cognition¹³ or the empathy of elephants¹⁴.

Suggested reading

¹DEAT 2007. Draft National Norms and Standards for the management of elephants in South Africa. Department of Environment and Tourism. Government Gazette, 2 March 2007.

²Geddie, W. 1966. *Chamber's twentieth Century Dictionary*. W.R. Chambers, Ltd. London.

³Hart, B.L., Hart, L.A., McCoy, M., and Sarath, C.R. 2001. Cognitive behaviour in Asian elephants use and modification of branches for fly switching. *Animal Behaviour* **62**: 839–847.

⁴Plotnik, J.M., deWaal, F.B.M. and Reiss, D. 2006. 'Self-recognition in an Asian elephant', *Proceedings of the National Academy of Sciences* **103**: 17053–7.

⁵Hakeem, A. Y., Hof, P. R., Sherwood, C. C., Switzer, R.C., Rasmussen, L. E. L. and Allman, J. A. 2005. Brain of the African elephant (*Loxodonta africana*): neuroanatomy from magnetic resonance images. *The Anatomical Record* **287A**:1117–1127.

⁶Bates, L.A., Sayialel, K., Njiraini, N., Poole, J.H. Moss, C.J., and Byrne, R.W. 2007. Elephants have expectations about the locations of out-of-sight family members. *Biological Letters* **4**: 34–36.

- ⁷Bates, L.A., Sayialel, K.N., Njiraini, N.W., Poole, J.H., Moss, C.J., and Byrne, R.W. 2007. Elephants classify human ethnic groups by odour and garment colour. *Current Biology*. **17**: 1938–1942.
- ⁸Burke, T. 2005. The effect of human disturbance on elephant behaviour, movement dynamics and stress in a small reserve: Pilansberg National Park. MSc thesis, University of KwaZulu Natal, Durban.
- ⁹Viljoen, J.J., Ganswindt, A., du Toit, J.T. and Langbauer, W.R. 2008. Translocation stress and faecal glucocorticoid metabolite levels in free-ranging African savanna elephants. *South African Journal of Wildlife Research* **38 (2)**: 146-152.
- ¹⁰Douglas-Hamilton, I., Bhalla, S., Wittemyer, G. and Vollrath, F. 2006. 'Behavioural reactions of elephants towards a dying and deceased matriarch', *Applied Animal Behaviour Science*, **100 (1–2)**: 87–102.
- ¹¹McComb, K., Baker, L., and Moss, C. 2006. African elephants show high levels of interest in the skulls and ivory of their own species. *Biological Letters* **2**: 26–28.
- ¹²McComb, K., Moss, C., Durant, S.M., Baker, L., and Sayialel, S. 2001. Matriarchs as repositories of social knowledge in African elephants. *Science* **292**: 491–494.
- ¹³Bates, L.A., Poole, J.H., and Byrne, R.W. 2008. Elephant cognition. *Current Biology* **18**: R544-R546.
- ¹⁴Bates, L.A., Lee, P.C., Njiraini, N., Poole, J.H., Sayialel, K., Sayialel, S., Moss C.J. and Byrne, R.W. 2008. Do elephants show empathy? *Journal of Consciousness Studies*, **15**: 204–25.