The Old School, Brewhouse Hill, Wheathampstead,
Hertfordshire AL4 8AN, UK
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*Individual variation in chimpanzee (*Pan troglodytes*) repertoires of abnormal behaviour*

Z Goldsborough[*†‡§], *EHM Sterck*[†#], *FBM de Waal*[†¥] *and CE Webb*[†¶]

[†] Animal Behaviour & Cognition, Department of Biology, Utrecht University, Utrecht, The Netherlands
[‡] Department for the Ecology of Animal Societies, Max Planck of Animal Behavior, Bücklestraße 5a, Room 519a, 78467, Konstanz, Germany
[§] Department of Biology, University of Konstanz, Konstanz, Germany
[#] Animal Science Department, BPRC, Rijswijk, The Netherlands
[¥] Department of Psychology, Emory University, Atlanta, USA
[¶] Department of Human Evolutionary Biology, Harvard University, Cambridge, USA
* Contact for correspondence: zgoldsborough@outlook.com

Abstract

*Abnormal behaviour in captive animals is both pervasive and ambiguous. Although individual differences are central to the field of animal welfare, studies on abnormal behaviour predominantly employ quantitative, population-level approaches. For example, whereas previous studies on chimpanzee (*Pan troglodytes*) abnormal behaviour have reported significant variation between groups or individuals in the quantity (eg frequency and duration) of abnormal behaviour, much less is known about qualitative differences. Individual abnormal behavioural repertoires may be highly idiosyncratic, where certain behaviours are over-represented (ie individually specific abnormal behavioural 'signatures'). The present study investigated qualitative individual variation in the abnormal behaviour of chimpanzees (n = 15) housed at Royal Burgers' Zoo in Arnhem, The Netherlands. Substantial variation was found between individuals in the diversity (size and evenness) and overall composition of their abnormal behavioural repertoires. Factors including age, sex, and rank did not significantly account for dissimilarity of individuals' abnormal behavioural repertoires, but kin dyads showed more similar abnormal behaviour than non-kin dyads. Further exploratory analyses examined whether individual variation in one abnormal behaviour (coprophagy) predicted variation in stress-related behaviour (self-scratching). This allowed us to tentatively conclude that there were also individual differences in the link between a given abnormal behaviour and the behavioural expression of stress. Qualitative individual variation in abnormal behaviour provides a novel angle to a literature traditionally focused on quantifying abnormal behaviour at the group- or species-level and may thus represent an important yet previously overlooked source of variation in the extent to which abnormal behaviour reflects the state of individual welfare.*

Keywords: *animal welfare, chimpanzees, coprophagy, stereotypical behaviour, stress, zoo-housed*