Does mirror enrichment improve primate well-being?

B de Groot* † and SM Cheyne†

† Lange Brugstraat 44C2, 4811 WS, Breda, The Netherlands
‡ Department of Social Sciences, Oxford Brookes University, Gibbs Building, Gipsy Lane, Headington, Oxford OX3 0BP, UK
* Contact for correspondence and requests for reprints: groot.de.brenda@gmail.com

Abstract

Primates are highly social animals and appropriate enrichment is required to ensure their psychological well-being. Mirrors are sometimes used as social or sensory environmental enrichment. In this paper we investigate the suitability of mirrors as enrichment for captive primates, by reviewing the literature on mirror implementation in captive primate environments. Mirror-directed responses are mainly social as the mirror self-image is often seen as a conspecific. Although positive exploration and affiliative behaviours are observed, negative aggressive behaviours towards the mirror are most frequently recorded, and abnormal behaviours in primates do not decrease in mirror-enriched environments. There appear to be differences in habituation rates to mirrors amongst primates. While habituation to enrichment is generally perceived to be undesirable, this criterion should not apply when mirrors elicit negative behaviours. Primates that show mirror self-recognition, which are mostly great apes, may be best suitable for mirror enrichment, as they do not perceive the mirror self-image as a threatening conspecific. Increasing the understanding of the reflective properties of a mirror might help primates to understand that the image in the mirror is not real. This could be attained by using small, mobile mirrors. We suggest that mirrors can make decent primate enrichment if the primate understands its reflective properties, which should be evaluated on an individual level. Appropriate use of mirrors as sensory enrichment can improve primate well-being and prevent suffering.

Keywords: abnormal behaviour, animal welfare, captivity, self-recognition, solitary, stress

Introduction

Although wild non-human primates (hereafter referred to as primates) are mainly restricted to tropical habitats, captive primates can be found all over the globe. In zoos they are a popular visitor attraction, and laboratories house primates for various experimental purposes. Humans have the obligation to ensure the well-being of these captive animals (Clark et al 1997). In this work we will refer to well-being as the psychological state of the animal, and welfare as comprising both well-being, the animals’ physical health and the ethical issues involved in these topics (eg Clark et al 1997; Fraser et al 1997).

The captive environment often differs substantially from its wild counterpart, which can have negative consequences for animal well-being (Broom 1991; Morgan & Tromborg 2007). Laboratory environments — and to a lesser extent zoo environments — can restrict the natural behavioural repertoire of animals and thereby lead to abnormal behaviours (Mason 1991b; Hosey 2005). Abnormal behaviours comprise unusual performances that indicate that the animal’s well-being is, or has been, sub-optimal (Broom 1991; Mason 1991a). Abnormal behaviours are observed in captive environments and rarely seen in the wild (Hosey 2005; Birkett & Newton-Fisher 2011, but see Grewal 1981).

The behaviours can signal psychological strain since they may be performed by the animal to cope with a stressful environment (Mason 1991a). Furthermore, self-injurious abnormal behaviours, such as hair-pulling, slapping or biting oneself, can be physically harmful for the animal. It appears that the prevalence and severity of abnormal behaviours rises with the deterioration of the animal’s environment or life experiences (Lutz et al 2003; Hosey 2005; Olsson & Westlund 2007).

Primates are highly social animals and social companionship is as much a need in a primate’s life as food (Dettmer & Fragaszy 2000). The absence of social companionship is particularly detrimental to the primate’s well-being (Mason 1991a). Oxytocin and arginine vasopressin, two hormones associated with good well-being, were significantly lower in socially isolated common marmosets (Callithrix jacchus) than in social marmosets (Seltzer & Ziegler 2007). Social isolation generally causes a high number of abnormal behaviours in the animal (Olsson & Westlund 2007; Price & Stoinsky 2007), which can persist even after the captive conditions are improved (Mason 1991a,b; Olsson & Westlund 2007). Ridley and Baker (1982) argue that to decrease abnormal behaviours and increase well-being, one should rather stimulate social interactions than attempt to suppress the abnormal behaviours. In situations where social...