Using multiple joystick systems in computerised enrichment for captive orangutans

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Abstract

It has been suggested that providing multiple computers with automatic reward dispensers as enrichment to captive orangutans (Pongo spp) (as opposed to a single computer, with a care-staff person delivering reinforcers) might help improve behavioural outcomes. The purpose of the current study was to test this hypothesis by providing two computers with automatic reward dispensers to eight orangutans housed in four male-female pairs at Zoo Atlanta, USA. Subjects were observed for ten days during each of three phases: a baseline phase (during which, no computer was provided); immediately followed by Phase 1 (during which, one computer system was provided to each pair of subjects); immediately followed by Phase 2 (during which, two computer systems were provided to each pair). Data were collected in 1-h sessions using instantaneous scan sampling. There was no habituation to the computer system, nor were there any significant increases in aggression, rough scratching, and abnormal behaviours in either computer phase, which indicates that computer-joystick systems are effective as enrichment for captive orangutans. However, a high level of interest in the computer was shown by only a few individuals, which highlights a need to take into consideration individual differences when providing computerised enrichment to captive non-human primates. It would also be advisable to provide other forms of enrichment to increase activity levels for individuals which are not interested in interacting with a computer, as well as to help increase the diversity of behaviours being stimulated by the enrichment.

Keywords: animal welfare, automated feeder, computers, enrichment, joystick, orangutans

Introduction

Environmental enrichment to improve captive animal welfare has traditionally involved providing opportunities for social interaction (eg social housing), and/or providing inanimate objects, which can be used either actively (eg puzzle feeders), or passively (eg television) (for reviews, see Shepherdson 1998; Young 2003; Lutz & Novak 2005). Social interactions are generally considered to be the most effective form of enrichment for group-living animals, mainly because they can be dynamic, unpredictable, and cognitively stimulating (for reviews, see Young 2003; Lutz & Novak 2005; Honess & Marin 2006). However, technological advances in recent decades have made it possible for so-called ‘inanimate’ devices to be designed in such a way as to provide cognitive challenges through dynamic and interactive experiences, one example being computerised enrichment devices.

In the late 1980s, a joystick-controlled computerised testing system (CTS) was developed by researchers at the Language Research Center (LRC) to test cognitive skills in non-human primates (Rumbaugh et al 1989; Washburn et al 1989a,b). Although the system was originally designed to test cognitive skills, it was also found to be a useful enrichment device for singly housed rhesus monkeys (Macaca mulatta) (Washburn & Rumbaugh 1992a,b). These researchers found a lack of habituation to the device, increased activity, and decreased self-directed behaviour (such as over-grooming), cage-directed behaviour (such as shaking/biting the mesh), and stereotypic pacing and rocking.

The LRC-CTS has also been found to be an effective enrichment device for socially housed non-human primates. Washburn et al (1994) found no evidence of habituation, aggression, or other undesirable behaviours (such as cage-biting and stereotypies), when two devices were provided to pair-housed rhesus monkeys. Similarly, when Lincoln et al (1994) provided three computerised testing devices to eight socially housed pig-tailed macaques (Macaca nemestrina), informal observations indicated that all individuals were using the devices, and there was no evidence of heightened aggression.