

Behavioral responses to the zoo environment by white handed gibbons

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Abstract

Although there is a growing literature on the effects of zoo environments on nonhuman primate behavior, comparatively little research has been published on the behavioral responses of gibbons and siamangs (family: Hylobatidae) to zoo visitors. Here, we present the findings from our study on the effects of noise, visitor group size, and the presence of children on certain aspects of behavior in white handed gibbons (*Hylobates lar*) housed in two separate Canadian zoos. Observational data on various behaviors were obtained through selective focal animal sampling. These data were analyzed using Chi-square tests to estimate the effects of noise level, viewing group size, and the presence of children on behavior. The results of this analysis indicate that noise level and viewing group size often significantly affect behavioral responses, particularly with communicative behaviors such as looking at visitors, and open mouth display, as well as locomotive behaviors such as brachiating, hanging, and bipedal walking.

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1. Introduction

There is a growing literature on the effects of the zoo environment on animal behavior, including the behavior of nonhuman primates (see Hosey, 1997, 2005; Melfi, 2005; Melfi and Hosey, 2005). Research has suggested that the physical and psychological well being of captive primates can be affected significantly by the zoo environment. The very presence of public viewers has been reported to alter primate behavior, including social interactions, territorial

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behavior, as well as behaviors such as locomotion, grooming, and feeding (e.g., Baines and Hosey, 2001; Chamove et al., 1988; Cook and Hosey, 1995; Davis et al., 2005; Glatston et al., 1984; Hosey, 2000; Hosey and Druck, 1987; Maple and Finlay, 1989; Mitchell et al., 1990, 1991a,b, 1992a,b,c; Orgeldinger, 1997). Housing conditions have also been reported to exacerbate the negative effects zoo visitors have on captive primates (Glatston et al., 1984), or even affect normal reproduction (Lukas et al., 2002; Mootnick and Nadler, 1997).

Research conducted by Hosey and Druck (1987) at the Chester Zoo in the United Kingdom found that large active groups of viewers provoked more human directed behavior in zoo primates than did small or large passive groups. This response was observed for a number of Anthropoid and Prosimian primate taxa including macaques, baboons, capuchins, and lemurs (Hosey and Druck, 1987). Although the activity level of the viewers seemed to be the primary effect on behavior in that study, Hosey and Druck (1987) found that the primates attempted to interact with all viewing public regardless of activity level or group size, suggesting that primate behavior is affected by the mere presence of zoo visitors. Similar research by Mitchell and co-workers (i.e., Mitchell et al., 1990, 1991a,b, 1992a,b,c) demonstrated that zoo visitor presence can increase aggression within the group as well as aggression directed at the visitors themselves.

In a study by Orgeldinger (1997), territorial and protective behavior in adult siamangs (*Hylobates syndactylus*) varied by sex. In that study males displayed greater interest in what was occurring outside their enclosures, spending more time near the borders of their exhibits than did females. Male siamangs performed a more protective and territorial role than females, spending up to 16.1% of their time occupied with territorial and protective behaviors such as vigilance, head nodding, body swaying, genital presentation, alarm calls, duetting, attacking behaviors, biting, facial grimace, and teeth bearing (Orgeldinger, 1997). In contrast, females exhibited territorial and protective behaviors primarily in the form of vigilance. Orgeldinger (1997) reported that large viewing groups and children evoked territorial and protective behavior in both sexes, while large groups of viewers without children evoked behaviors such as piloerection, atypical brachiation, pirouetting and bipedal running with raised hands and noise making. In a pair of white cheeked gibbons at the Lincoln Park Zoo, exposure to the public was reported to result in the female gibbon spending less time resting and more time concerned with self-directed behaviors, while the male spent less time performing locomotive behaviors and more time resting (Lukas et al., 2002). In contrast, the primates studied at the Chester Zoo by Hosey and Druck (1987) exhibited more locomotive activity in the presence of active groups than in the presence of passive groups.

The purpose of the present research is to investigate the effects of the viewing public on the behavior of captive gibbons (genus: *Hylobates*) housed in two zoos in Ontario, Canada. Based on the previous research presented above we would expect the presence of zoo visitors to adversely affect captive gibbon behavior. As such, rejection of the null hypothesis of no significant change associated with the presence of zoo visitors would be consistent with our expectations based on literature.

2. Methods

The Toronto Zoo is a 287.3 ha facility housing over 5000 animals. The zoo receives approximately 1.2 million visitors per year and is open throughout the year. The gibbons were housed together in a temperature controlled indoor kidney-shaped enclosure with one glass fronted public viewing area and another delineated by a pond and a low wall. The enclosure included several climbing apparatus comprising

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