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SHORT REPORT

CHIMPANZEE *(PAN TROGLODYTES)* MOTHERS' RESPONSE TO SEPARATION FROM INFANTS

M. A. Bloomsmith[1], J. J. Merhalski[1] and Gigi Gregor[2]

ABSTRACT: Three chimpanzee infants were separated from their mothers. The behavior of the mothers was monitored before and after separation. Data were equally divided between pre- and post-separation observation periods. The mothers exhibited significantly reduced levels of play and significantly more time spent in proximity to an older offspring after they were permanently separated from their infants. No other recorded behaviors were significantly altered. The mothers exhibited individual differences immediately following the separation. The findings are consistent with other studies that noted the relatively mild maternal reactions to infant separation and the attenuating effect of familiar conspecifics in the post-separation environment.

INTRODUCTION

No report of great ape maternal response to infant separation has been published. The extensive study of social separation in nonhuman primates has emphasized the response of infants removed from their mothers. A few experimenters have described the behavior of adolescent or young adult macaques after such separation (Bowden and McKinney, 1972; Suomi et al., 1975) and the response of monkey mothers to separation from their infants (Hinde and McGinnis, 1977; Jensen, 1968; Jensen and Tolman, 1962; Suomi et al., 1983). The purpose of the present pilot study was to document the response of chimpanzee mothers to separation, identifying evidence of "protest" or "despair" (under Bowlby's scheme (1960)) as the mother continued to live in a familiar social group.

Address correspondence to Dr. Mollie Bloomsmith, The University of Texas, M. D. Anderson, Science Park, Veterinary Resources Department, Route 2, Box 151-B1, Bastrop, Texas 78602, USA.

1. The University of Texas M.D. Anderson Cancer Center.

2. Department of Anthropology, The University of Texas, Austin, Texas.

METHODS

Animals

Three competent mother chimpanzees *(Pan troglodytes)* between 19 and 21 years old were observed. Each mother had an infant between 21 and 23 months of age that was separated from her during the study and an older offspring between five and six years of age that had lived with her continually. Each chimpanzee lived in a stable social group consisting of adults of both sexes and their offspring in similar, 22-m outdoor corrals containing climbing structures, large cement culverts, movable objects, and natural, grassy ground cover. The facilities and colony management have been described (Riddle et al., 1982).

Procedure

Data were collected for three weeks prior to and three weeks following the mother-infant separation. (The separations were completed for the purposes of another study). Twenty 15-min observation sessions were conducted for each mother during each of the two experimental phases, totalling 30 hours of data collection. Eleven behaviors representing seven different behavioral categories (agonism, prosocial behavior, locomotion, inactivity, vocalization, abnormal and other behaviors) were recorded at 10-second intervals using a scan-sampling technique. The category of prosocial behavior was composed of grooming and playing. The vocalizations recorded were pant grunts, pant hoots, food calls and whimpering. The age and sex of each animal interacting with the focal animal at the sampling point was recorded in addition to all animals within 1 m of the focal animal.

On the day of separation the three mothers, with their infants, were removed from their social groups and anesthetized with ketamine hydrochloride. When alert, they were fed a small meal and then reintroduced without their infants to their social groups approximately 7 hours after the initial separation. The first post-separation observation sessions was conducted upon their re-entry.

Analysis

Data were analyzed by the nonparametric sign test for related samples to detect differences between pre- and post-separation levels in each of the seven behavioral categories and in the proximity information. Statistical comparisons were made between pairs of data collection sessions composed of one pre-test and one post-test session.

RESULTS

Sign test results indicated that the animals displayed significantly lower levels of play ($p < .001$) and spent significantly more time in proximity to their older offspring ($p = .003$) in the post-separation phase. No other recorded behaviors or states of proximity were significantly changed.

Some individual differences in the behavior were obvious when the data were examined. One mother vocalized twice as much in the first session after separation than she did in any other session. All of these 32 instances of vocalizing (of 90 possible) were whimpering. She also engaged in self-slapping (during 5 of 90 data points) and rocked (during 13 of the 90 data points). However, by the following day her behavior was not distinguishable from her pre-separation behavior. None of the others had been observed to self-slap, rock, or whimper in the pre-separation phase. One other mother appeared to look toward the room that housed the recently separated infants (during 12 of the 90 data points). Though visual contact was not possible, she may have heard infant vocalizations, but neither she nor the third mother reacted like the subject described earlier.

During the post-separation phase two of the three chimpanzees were not observed playing (illustrated by the significant sign test result), but the third mother's level of play doubled. All of her post-separation play was recorded late in the study, after the seventeenth post-separation data collection session. Prior to separation from her infant, this mother had divided her play between her infant and her older offspring (57% and 43% respectively). After the separation, 93% of her play was with her older offspring. In contrast, greater percentages of the other mothers' play was with their infants (77% and 93%), and smaller percentages with their older offspring (3.5% and 4.5%).

DISCUSSION

The results indicate little evidence of an extended "protest" and no evidence of "despair" (Bowlby, 1960) by the three chimpanzee mothers after permanent separation from their infants. This finding is consistent with studies of monkey mothers (Hinde and McGinnis, 1977; Jensen, 1968; Suomi et al., 1983), although evidence of a brief period of agitation has been reported (Jensen, 1968). Individual differences were apparent among the three chimpanzees. Two of the three displayed no protest or agitation reaction. The third showed her highest levels of vocalizing, self-slapping, and rocking during the session immediately following the separation. This protest was not displayed beyond the first day after

separation. No mother showed evidence of despair as might have been indicated by high levels of inactivity. The mother that displayed the protest was the only one that showed an increased level of play during the post-separation phase, which can be interpreted as additional evidence for a lack of despair. The two other chimpanzees did not play in the post-separation phase, perhaps because their infants had been their predominant play partners while about half of the other mother's pre-separation play was with her older son.

The presence of familiar group members in the post-separation environment may have attenuated the mothers' reactions to separation from their infants, as has been found in other separation studies (Bard and Nadler, 1983; Codner and Nadler, 1984; Suomi et al., 1975). The presence of the older offspring may have been particularly important; in significantly more instances the mothers were in proximity to their older offspring in the post-separation phase.

In conclusion, a cross-species similarity in maternal response is suggested by the agreement between the results of this study and those utilizing macaques. The individual variation described in the severity of the short-duration protest reaction, however, may justify further investigation in great apes.

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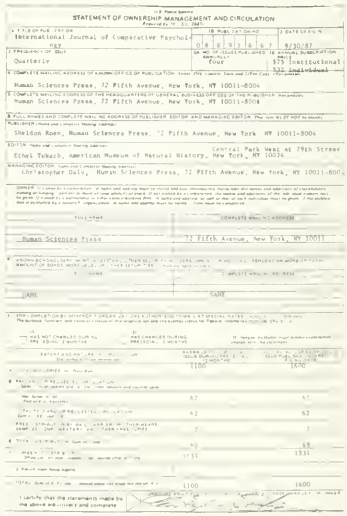

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