REACTION OF THE CAPTIVE INFANT BABOON TO A SURROGATE MOTHER

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ABSTRACT

Baboon infants were captured with their mothers in the Loskopdam area. The infants were separated from their mothers and raised in a laboratory. Each infant was placed with a surrogate mother. The infants accepted their surrogate mothers immediately. The very young infants spent most of their time with the mother where they suckled and slept for long periods. The older infants spent less time with their mothers. They only returned to the mother to be fed, to sleep or when frightened. The surrogate mothers that we have designed satisfied the needs of the infant. Thus infants were raised successfully in the laboratory.

Mother-infant relations in non-human primates have been studied by many primatologists (Sugiyama 1965; Harlow, Harlow & Hansen 1963; Jay 1963; DeVore 1963). Since an infant's first social responses are towards its mother this relationship is extremely important and will have a considerable influence on the development of the infant's social behaviour.

Hinde, Spencer-Booth and Bruce (1966), Seay and Harlow (1965) and several other primatologists have studied the effects of separation between mother and infant primates and they found that all infants initially displayed extreme distress by abnormal vocalization and activity for a period of more or less 48 hours after separation. This was followed by a period of depression. Rhesus monkey infants were raised in the same colony and separated from their mothers but not from one another (Suomi, Harlow & Domek 1970). The infants did not display violent reaction to maternal separation but their vocalization and activity increased considerably when separated from one another.

The importance of primates as laboratory animals has increased tremendously during the last decade and even in South Africa this animal is being used more and more for research purposes. Infants, raised in captivity are therefore more in demand and consequently an effort was made to raise them in our laboratory. This study concerns the reactions of infant baboons to a surrogate mother and formed part of a larger study of the social development of infant baboons.

A previous attempt to raise infant baboons in captivity without surrogate mothers resulted in the death of eight of the sixteen infants due to insufficient warmth.

PROCEDURE

Infant baboons *(Papio ursinus)* were captured at the Loskopdam area in central Transvaal during a population study programme. Captured infants were immediately separated from their mothers and placed together with surrogate mothers in a laboratory specially designed to promote the study of their behaviour. Only two very young infants were captured. These were: Female M, only

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a few hours old, and female F estimated to be less than two weeks old. There were also three other young baboons, females S and P and male B, all approximately five months old.

The surrogate mothers consisted of a wooden box base covered with 12 gauge iron mesh. This formed a platform for the infant to sit on. An iron mesh cylinder, 20 cm in diameter, the top of which was covered with a lid, was mounted at a slight angle on the base. An electric bulb was fitted inside the base of the cylinder to provide the necessary heat. In the cylinder was a small platform on which the milk bottle rested. The teat of the bottle protruded through the mesh which was covered with washable, hairy acrylic carpeting.

All activities of the infants were timed during study periods and recorded on score sheets which made provision for all possible activities. Infant M was studied for only 10 hours since she died at the age of three weeks when the electrical system of the laboratory became defective. Infant F was studied for 140 hours during a five month period and 15 hours were recorded for each of the three older animals.

RESULTS AND DISCUSSION

On introduction to the surrogate mother, all infants instantly clung to the apparatus. Until they became used to their new environment, which took a few days, they maintained close contact with her. F was observed to scream at and bit the surrogate mother when she caught her foot in the wire mesh. Of all the infants, only M readily accepted the teat and milk from the surrogate mother. The other infants took a long time to get used to the bottle.

The infants clung to the long-haired acrylic carpets in a typical mother- infant posture. The surrogate mother also satisfied the emotional needs of the infant. Whenever danger threatened, e.g. planes flying over, they all clung to the mothers.

1. Time spent on the surrogate mother

1.1. Newly-born infants

M and F spent 98,8% and 93,4% of their observed time respectively on the mother during the first weeks of life (see Table 1). F spent less time with the mother as she grew older until the age of five months at which time she only spent 57,5% of her time with the mother.

The behaviour patterns displayed by infants on the mother were classified under the following headings: sleeping, investigating the surrogate mother, sitting on the mother, clinging to the mother, clinging while sucking the teat. When the infant was not on the mother, it spent its time walking, sitting, investigating its environment, and making contact with the other infants by playing with them, grooming them, touching them or displaying dominance.

Table 2 indicates, in percentage of observed time, that F slept less, investigated the mother less and clung less to the mother as she grew older. Why she sucked the teat increasingly is difficult to explain and further investigation is needed before a conclusion can be reached. As she spent less time with the mother she investigated the environment and contacted the other infants more frequently.

TABLE 1

PERIODS, GIVEN IN PERCENTAGE OF TIME, THAT INFANTS SPENT IN CONTACT WITH THE SURROGATE MOTHER DURING THE FIRST FIVE MONTHS OF LIFE

Infant	*Age in weeks*	*Time (%) with mother*	*Time (%) not with mother*
M	0–3	98,8	1,2
F	2–6	93,4	6,6
F	6–10	92,0	8,0
F	10–14	74,6	25,4
F	14–18	65,4	34,6
F	18–22	57,5	42,5

TABLE 2

FEMALE F'S ACTIVITIES DURING THE FIRST FIVE MONTHS OF LIFE GIVEN IN PERCENTAGES OF OBSERVED TIME

	ON THE MOTHER					NOT ON THE MOTHER			
Approx. age in months	*Sleeping*	*Investi-gating*	*Sitting*	*Clinging*	*Suckling*	*Walking*	*Investi-gating*	*Sitting*	*Contact with other infants*
1	46,9	19,5	3,9	18,9	4,2	0,5	4,3	1,0	0,8
2	43,3	17,8	5,9	12,3	12,7	0,4	5,9	0,1	1,6
3	30,8	15,7	3,3	11,5	13,3	2,9	16,3	0,9	5,3
4	18,1	15,2	0,9	9,1	22,2	3,3	24,9	0,4	5,9
5	17,3	7,0	1,5	6,3	20,5	2,0	35,5	0,9	9,2

1.2. The older infants

Table 3 indicates the percentage of observed time spent by the five-month-olds with their surrogate mothers. Data available for F at the age of five months are included in this table for comparison. B, S and P were introduced to the surrogate mother at the age of five months whereas F grew up with the mother. This may account for the observed difference in the time spent with the mother. B spent 48% of his time on the mother which is much more than S and P who only spent 29,5% and 32,7% of their time respectively on the mothers.

Further differences between the behaviour patterns of the infants at the age of five months are indicated in Table 4. B spent much less time investigating the environment and making contact with his playmates than S, P and F. B spent more time sitting with the mother than S and P but less than F. B also slept more than the other infants. F. usually sat with her surrogate mother in

TABLE 3

PERIODS THAT FOUR FIVE-MONTH-OLD INFANTS SPENT IN CONTACT WITH THE SURROGATE MOTHERS, GIVEN IN PERCENTAGES OF TIME

Infant	*Time (%) not spent with mother*	*Time (%) spent with mother*
S	70,5	29,5
P	67,3	32,7
B	52,0	48,0
F	42,5	57,5

TABLE 4

TIME, GIVEN AS PERCENTAGE, SPENT ON VARIOUS ACTIVITIES BY FOUR FIVE-MONTH-OLD INFANTS

	Not on the mother				*On the mother*	
Infant	*Investigating*	*Walking*	*Sitting*	*Contact with other infants*	*Sitting/ investigating*	*Sleeping*
S	39,8	1,3	15,7	13,7	4,3	25,2
P	33,2	2,1	20,9	11,1	10,6	22,1
B	24,5	0,6	19,7	7,2	19,9	28,1
F	35,3	2,0	0,9	9,2	35,3	17,3

contrast to S and P who did not prefer to sit with the mother. B spent an equal amount of time sitting with or apart from the mother. Of the four infants, S spent the most time investigating the environment and making contact with her playmates.

CONCLUSION

Surrogate mothers proved to be a satisfactory substitute to young baboons. The very young infants spent most of their time on the mother while older infants turned to the mother only when hungry, sleepy or frightened.

The differences in behaviour patterns as displayed by the infants were thought to be indicative of their different personalities. S was a much more active and independent baboon than B who was not very active or interested in social contact. P and F revealed behaviour patterns between these two extremes.

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