

## Social Development of Stumptail Macaques (*Macaca arctoides*): Momentary Touching, Play, and Other Interactions with Aunts and Immatures During the Infants' First 60 Days of Life

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**ABSTRACT.** Interactions of seven infant stumptail macaques with aunts and immatures were observed during the infants' first 60 days of life in colony groups. Data were collected using 14 interaction categories, including typical maternal behaviors, play, and five categories of momentary touching. Aunts and immatures rarely engaged in maternal behaviors such as clinging, carrying, or retrieving. Both aunts and immatures were recorded momentarily touching the infants; aunts groomed them and immatures began playing with them during the second month. Such play was primarily between age-mates and rarely between infants and yearlings. Adult males engaged in more maternal behavior than aunts during the infants' first two months of life.

### INTRODUCTION

Survival of infant macaques depends upon a social system in which all group members are potential interactants with both infants and mothers (HAMBURG, 1969). The behavior of group members affects the character of the infant's relationship with its mother and the extent of its early experience with others (e.g., HINDE, 1965; HINDE & SPENCER-BOOTH, 1967a; HORWICH & MANSKI, 1975; ITANI, 1963; JAY, 1963; KAWAI, 1965; KAWAMURA, 1965; ROSENBLUM & KAUFMAN, 1967; ROWELL, HINDE, & SPENCER-BOOTH, 1964; SADE, 1967; SPENCER-BOOTH, 1968); consequently, a full account of a macaque's early experience will include information about the degree to which nonmaternal group members interact with it, in what way, and during what time periods.

The present report together with a previous one (HENDY-NEELY & RHINE, 1977) describes interactions between nonmaternal others and infant stumptail macaques (*Macaca arctoides*) during their first 60 days of life. These interactions, plus knowledge of the adult social structure of the colony groups into which infants were born (RHINE, 1972, 1973; RHINE & KRONENWETTER, 1972), provide a context within which maternal interactions can be interpreted. The present paper concentrates upon infant interactions with immatures and aunts (nonmaternal adult females) and upon comparisons of such interactions with those occurring between these same infants and adult males.

### METHOD

#### SUBJECTS AND ENVIRONMENT

The subjects were four male and three female infants born into two colony groups described by HENDY-NEELY and RHINE (1977), who also gave the infants' birthdates

and described the living conditions in which the infants spent their first 60 days of life. The two groups were left undisturbed as much as possible in identical  $20 \times 12 \times 7$  ft colony cages.

The mean number of nonmaternal interactants living with an infant during the 10-day periods in which the data will be presented was 1.96 ( $\sigma=.10$ ) adult males, 2.13 ( $\sigma=.79$ ) aunts, and 2.56 ( $\sigma=1.81$ ) immatures.

The composition of the groups into which infants were born varied since some adults had to be removed temporarily for medical or other reasons (HENDY-NEELY & RHINE, 1977). The subjects were born at different times, so the early born had fewer immature companions than the later born, and *Emma*, the first born infant of one group, had no immature companions at all during the period of this report.

#### PROCEDURE

Individual infants were observed, using social behavior categories defined in full by HENDY-NEELY and RHINE (1977). Some of these behaviors are commonly collected in studies of mother-infant or peer interactions as follows: ventral-ventral cling, ventral-ventral cradle, ventral-dorsal cling, restrain, retrieve, grooms, is groomed, rough and tumble (R & T) play, and approach-withdrawal (A-W) play (e.g., HANSEN, 1966; HARLOW, 1971; HINDE & SPENCER-BOOTH, 1967b; ROSENBLUM & KAUFMAN, 1967; ROWELL, DIN, & OMAR, 1968; SEAY, 1966). In addition, five categories of momentary touching behavior were used. Three of these touching categories involved touching of the infant by another (the infant is touched by an interactant's hand, face, or other body parts) and the remaining two involved touching of another by the infant (the infant touches another with his hand or grasps another's hair or body).

Observations were made using the one-zero sampling technique, a measure which combines the actual rate and duration of stump-tail social interactions into a single index (RHINE & FLANIGON, 1978). Using this method, a defined behavior was recorded once if it occurred one or more times during a 30 sec time period; consequently, the data are the percent of 30 sec observation periods in which the behavior occurred. The total number of 30 sec periods during which an infant was observed depended upon the number of infants and trained observers available at a given time. Thus, *Emma*, the first born infant, was observed for 7455 periods, which was the most for any infant, and *Ivan*, the last born, for 1011, which was the least. On the average, an infant was observed for 3011 30 sec periods, which is 25 min for each of 60 days.

#### RESULTS

There was very little interaction among aunts and infants for behaviors other than aunts grooming infants, aunts touching infants, and infants touching aunts. Similarly, interactions of immatures with infants were limited primarily to rough and tumble play and to the two sets of touching interactions occurring also for aunts. Indeed, if the momentary touching data had not been collected, one would conclude that young stump-tails had very limited experience with aunts and immatures.

Figure 1 compares the degree to which aunts, immatures, and adult males (HENDY-NEELY & RHINE, 1977) interact with infants on grooming and touching. The points

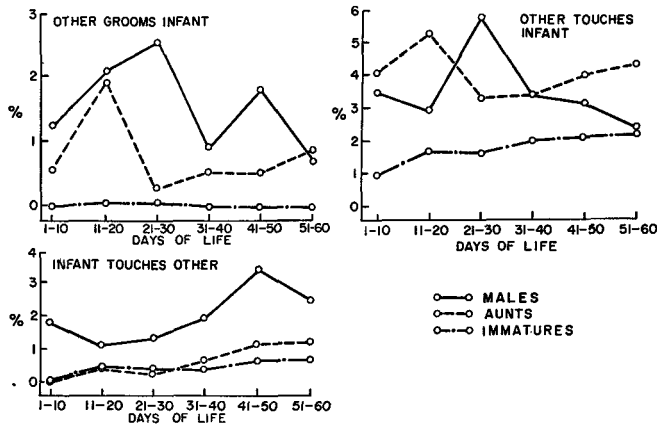


Fig. 1. Mean percent of 30 sec intervals in which adult males, aunts, and immatures groomed or touched infants.

for grooming and touching in Figure 1 were calculated using an averaging method which takes into account differences among age-sex classes in opportunities to interact with infants. For example, in a given time period of the curve for male touching, the percent of the observed 30 sec intervals in which a particular infant received a *touch-face* interaction from a particular adult male was calculated for each infant/male dyad. This calculation was also made for the other two momentary touching interactions (*touch hand* and *touch general*). The resulting percentages were averaged across the three types of interactions, the four adult males, and the seven infants, providing a single percent indicating the degree to which the average male touched the average infant.

Statistical tests were calculated, using the points in the curves of Figure 1 as scores in randomized block designs (KIRK, 1968). A significant difference occurred among the curves for grooming after heterogeneity of variance was reduced by a square root transformation ( $F=44.39$ ,  $df=2, 10$ ,  $p<.001$ ). Since four of the six points for immatures were zero, considerable heterogeneity of variance remained even after the transformation; however, the  $F$ -test is robust (WINER, 1971), and 44.39 is approximately three times the size of the  $F$  needed for significance at the .001 level. There was no effect associated with time periods ( $F<1$ ), but there was a difference between aunts and adult males at the .05 level of significance ( $F=8.57$ ,  $df=1, 10$ ).

Infants were touched by immatures less often than by adults ( $F=9.58$ ,  $df=2, 10$ ,  $p<.01$ ), but no difference occurred across 10-day periods ( $F=1.11$ ). On the other hand, infant touching of nonmaternal others did increase with time ( $F=4.31$ ,  $df=5, 10$ ,  $p<.025$ ). In addition, infants touched adult males more often than they touched aunts or immatures ( $F=27.62$ ,  $df=2, 10$ ,  $p<.001$ ).

It seems clear that infants played with immatures more than with nonmaternal adults since play with the latter was almost nonexistent. Most of the play during the first 60 days was rough and tumble, as the curves in Figure 2 indicate. The difference between the two curves is significant using a square root transformation to reduce heterogeneity of variance and a  $t$ -test for dependent scores ( $t = 8.51$ ,  $df = 4$ ,  $p<.01$ ).

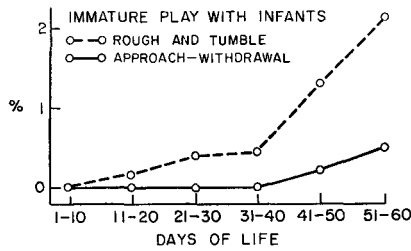


Fig. 2. Mean percent of 30 sec intervals in which immatures played with infants.

Differences among time periods were tested with a randomized blocks design in which subjects were one variable and 10-day time periods was the other. It appears from the curves of play that a significant difference among time periods ( $F=3.07$ ,  $df=5$ ,  $20$ ,  $p<.05$ ) is due mostly to an increase over time in rough and tumble play.

Some behaviors were rarely recorded for one or more of the three age-sex classes we have been considering. A behavior was considered rare if it was recorded at most during one-tenth of one percent of the total number of 30 sec intervals that all infants were observed. Infants did virtually no nonmaternal grooming during the first 60 days and none of the five touching behaviors were classified as rarely occurring. Of the remaining behaviors recorded, all but grooming were rare for aunts and all except rough and tumble play were rare for immatures. Only play was rare for adult males, who are more likely than aunts and immatures to engage in behaviors commonly found in mother-infant interactions, such as ventral clinging or retrieving (HENDY-NEELY & RHINE, 1977).

Table 1 shows, by behavior and individual infant, the time period in which the infant was first recorded interacting three or more times with an aunt or immature. For purposes of this table, the first 30 days are divided into five day periods. The marginal means were calculated using the midpoints of entries, or 60 where entries in the Table are dashes. Grooming by infants was omitted from the Table since it failed to occur three or more times in any time interval. Table 1 may be compared statistically with a similar one prepared for adult males by HENDY-NEELY and RHINE (1977) by treating the row means as scores for the three age-sex groups. The means of these scores, omitting play which was not included in the Table for males, were 39.38 for aunts, 31.45 for males, and 44.87 for immatures, and these means do not differ significantly from each other ( $F=1.43$ ,  $df=2$ ,  $30$ ,  $p>.25$ ). Thus, although the one-zero frequency of many male interactions with infants was greater than that for aunts or immatures, all three groups tended to begin interactions occurring during the first two months at about the same time. The earliest interactions for all three age-sex classes were in the three behavior categories for which an infant was momentarily touched by another.

Immatures of a similar age tended to interact together more than those whose ages were disparate. The immatures were born in two successive years, so their interaction opportunities could be separated into eight infant-immature dyads in which one animal was five and one-half or fewer months older than the other (i.e., both were small infants), and 11 dyads in which one of the pair was 10 or more months older than the

**Table 1.** Time period during which each of 13 aunt-infant or immature-infant behaviors were first recorded three or more times.

Behavior	Infant							Mean
	<i>Emma</i>	<i>Fran</i>	<i>Ivan</i>	<i>Paul</i>	<i>Queen</i>	<i>Sam</i>	<i>Vic</i>	
<i>Aunts</i>								
Groomed	6-10	51-60	41-50	16-20	1-5	26-30	11-15	24.43
Ventral cling	51-60	—	—	—	—	—	—	59.36
Ventral cradle	51-60	—	—	—	—	41-50	—	57.29
Dorsal cling	31-40	—	—	—	—	41-50	—	54.43
Restrain	—	—	—	—	—	—	—	60.00
Retrieve	—	—	—	—	—	—	—	60.00
Touch hand	1-5	1-5	31-40	6-10	1-5	6-10	6-10	9.79
Touch face	1-5	1-5	6-10	1-5	1-5	1-5	6-10	4.43
Touch general	16-20	6-10	16-20	1-5	1-5	6-10	6-10	9.43
Grasp other	31-40	—	—	41-50	—	31-40	—	50.93
Touch other	1-5	51-60	—	31-40	—	26-30	—	43.14
R & T play	51-60	—	—	—	—	—	—	59.36
A-W play	51-60	—	—	—	—	—	—	59.36
Mean	34.46	46.54	49.78	41.00	42.46	38.58	44.38	42.46
<i>Immatures</i>								
Groomed	—	—	11-15	—	—	—	—	50.60
Ventral cling	—	—	—	—	—	—	—	60.00
Ventral cradle	—	—	—	—	—	—	—	60.00
Dorsal cling	—	—	—	—	—	—	—	60.00
Restrain	—	—	—	—	—	—	—	60.00
Retrieve	—	—	—	—	—	—	—	60.00
Touch hand	—	6-10	11-15	16-20	1-5	—	11-15	11.00
Touch face	—	6-10	11-15	1-5	21-25	—	—	21.40
Touch general	—	6-10	6-10	51-60	6-10	—	6-10	17.50
Grasp other	—	21-25	—	51-60	21-25	—	—	44.30
Touch other	—	21-25	—	51-60	41-50	—	—	48.80
R & T play	—	16-20	—	51-60	41-50	—	21-25	40.40
A-W play	—	41-50	—	—	51-60	—	—	56.20
Mean	—	37.96	45.15	51.00	43.35	—	49.54	45.40

During the first 60 days of life, no immature interactants were available for *Emma*; *Sam* did not have an immature interactant available during his first 30 days. A dash indicates that the behavior did not occur at least three times during any of the time periods.

other (i.e., small infants interacting with yearlings). Comparison of mean interaction percentages for these dyads was made by a factorial analysis, utilizing a square root transformation to reduce heterogeneity of variance. A two-factor repeated measures design was applied using the unweighted means solution to account for unequal *N*'s (WINER, 1971). Older-versus-younger interactants was an independent factor, and the five touching behaviors and rough and tumble play was the repeated-measures factor, which consisted of all the infant-immature behaviors that were not classified as rare. A score in the analysis was the number of 30 sec intervals in which the behavior occurred divided by the total number of intervals in which it could have occurred. The means of these scores for the six behaviors and two age groups are given in Table 2. The analysis of variance yielded significant differences among behaviors ( $F=16.50$ ,  $df=5$ , 85,  $p<.001$ ), between age groups ( $F=8.09$ ,  $df=1$ , 17,  $p<.025$ ), and for the interaction of the two ( $F=8.87$ ,  $df=5$ , 85,  $p<.001$ ). A major reason for the interaction is the relatively large amount of rough and tumble play among small infants of similar ages versus little play among small infants and yearlings. The

**Table 2.** Mean percentages of interactions for six behaviors exhibited by younger or older immatures.

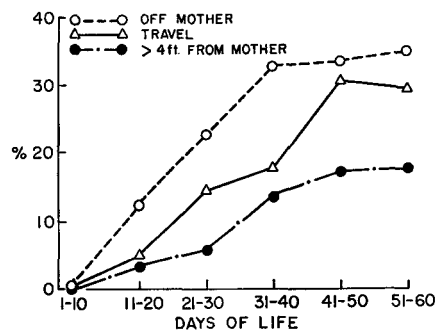
Immature age	Behaviors					
	Touch hand	Touch face	Touch general	Grasp other	Touch other	R & T play
Older	1.15	1.08	1.38	.20	.09	.04
Younger	1.70	.33	5.03	.33	.78	2.48

difference between the means for rough and tumble play is significant ( $t=4.29$ ,  $df=17$ ,  $p<.001$ ).

## DISCUSSION

HORWICH and MANSKI (1975) and LANCASTER (1971) have summarized evidence indicating that aunts or immatures of some species of Colobinae or Cercopithecinae engage in considerable social interchange with infants. Among the Colobinae studied so far, transfer of very young infants to aunts is common, whereas it is relatively rare in Cercopithecinae, which are more likely to touch or groom very young infants who remain with their mothers. In this respect, our stumpails were similar to rhesus macaques (*M. mulatta*) (HINDE & SPENCER-BOOTH, 1967a; ROWELL, HINDE, & SPENCER-BOOTH, 1964; SPENCER-BOOTH, 1968), though small infants appear to be touched and groomed more by mature stumpail females than by mature rhesus females.

Once small stumpail infants begin moving away from their mothers, they begin playing occasionally with near age-mates. Figure 3 provides indices of early mother-infant separation. The curve for travel in Figure 3 indicates the percentage of 30 sec periods in which the infant moved one body length or more by itself. The other two curves of Figure 3 indicate the percentage of periods during some part of which the infant was not touching its mother or was four or more feet from her. In the second month, especially, the infant does considerable traveling on its own and begins to move a short distance from its mother. This is the time when increases occur in play with other immatures and in infant touching of nonmaternal others. Very young stumpails may play with age-mates rather than yearlings simply because mothers with small infants tend to associate with each other. In addition, yearlings may antici-



**Fig. 3.** Mean percent of 30 sec intervals when an infant was off its mother, was greater than 4 ft. from her, or traveled.

pate aversive consequences when a tiny infant squeals, which might occur if a yearling played as roughly with a small infant as it would with an age-mate. Perhaps, too, older animals interested in the infant will threaten away competing yearlings. And finally, a yearling may receive little satisfaction from play with very small infants and may prefer the rougher, faster play of its own age-mates.

During the first 60 days, stumptail infants received substantial attention from adult males. There is considerable variation among macaque species in the degree to which adult males interact with young (e.g., BURTON, 1972; DEAG & CROOK, 1971; GOUZOULES, 1975; HENDY-NEELY & RHINE, 1977; ITANI, 1963; MITCHELL, 1969; MITCHELL & BRANDT, 1972; SPENCER-BOOTH, 1968); BRANDT, IRONS, and MITCHELL (1970) found that male interactions with infants were greater for stumptails than for males of three other macaque species, not including the Gibraltar macaque (*M. sylvana*). Male Gibraltar macaques may interact with young as much or more than stumptails (BURTON, 1972; DEAG & CROOK, 1971; LAHIRI & SOUTHWICK, 1966).

It is perhaps surprising to find typical maternal acts, such as carrying and retrieving, being performed more often by stumptail males than by adult females. Of course, after the first 60 days, this situation may be reversed for both aunts and older immatures, and as time passes increased interactions among age-mates would also be expected. Furthermore, the interaction patterns found in colony groups might be quite different from patterns occurring in the field where, for example, mothers can more readily escape males interested in their babies. Unfortunately, information about free-ranging stumptails is too scanty (BERTRAND, 1969) to compare colony and field behavior. If male-infant interactions are indeed rarer in the field than in captivity, then colony conditions appear to magnify this important social tendency to the point where it can be seen and studied. The stumptail male's interest in very small infants can be quite strong. For example, when a small white infant squeezed out of a colony cage and was unable to return, the dominant male put on one of the fiercest, loudest displays ever seen or heard in the colony, and he continued displaying until the infant was retrieved by an animal caretaker and returned to its mother. A male's attraction to very young infants would have the advantage of protecting them from external threats and of tending to insulate mothers and infants from any internal troop disturbance. An exception may be agonistic buffering in which a male carries an infant during an agonistic encounter with another male (DEAG & CROOK, 1971).

Infant attractiveness is one of a mosaic of cohesive forces holding together primate groups in which infant survival goes beyond the mother to the group as a whole (HAMBURG, 1969; HORWICH & MANSKI, 1975). Species variation in infant-male interactions could be due either to different functions of male interest in addition to protection, or to species differences in adaptive modifications underlying somewhat different male-infant interaction patterns, which nevertheless all serve the same functions. Among the Cercopithecinae most closely studied, juvenile or adolescent females were particularly interested in infants (CHAMOVE, HARLOW, & MITCHELL, 1967; GARTLAN, 1969; LANCASTER, 1971; SPENCER-BOOTH, 1968; STRUHSAKER, 1971), and handling of infants by such nulliparous females is thought to be an adaptive prelude to successful motherhood. Older aunts can provide substitute care and a base of emotional security in cases where weaned or partially weaned young have lost their

mothers, either permanently or temporarily (ROSENBLUM, 1971). The stumptail pattern of other-infant interactions during early life may differ in specifics from other macaques, but it is similar in broad outlines to known Cercopithecinae and probably serves the same general functions proposed to explain infant attractiveness in other members of this sub-family.

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## REFERENCES

- BERTRAND, M., 1969. *The Behavioral Repertoire of the Stumptail Macaque*. Bibliotheca Primatologica, No. 11, S. Karger, Basel, pp. 273.
- BRANDT, E. M., R. IRONS, & G. MITCHELL, 1970. Paternalistic behavior in four species of macaques. *Brain, Behav. Evol.*, 3: 415-420.
- BURTON, F. D., 1972. The integration of biology and behavior in the socialization of *Macaca sylvana* of Gibraltar. In: *Primate Socialization*, R. E. POIRIER (ed.), Random House, New York, pp. 29-62.
- CHAMOVE, A. A., H. F. HARLOW, & G. D. MITCHELL, 1967. Sex differences in the infant-directed behavior of preadolescent rhesus monkeys. *Child Develop.*, 38: 329-335.
- DEAG, J. M. & J. H. CROOK, 1971. Social behaviour and "agonistic buffering" in the wild Barbary macaque *Macaca sylvana*. *Folia primat.*, 15: 183-200.
- GARTLAN, J. S., 1969. Sexual and maternal behaviour of the vervet monkey, *Cercopithecus aethiops*. *J. reprod. Fert., Suppl.*, 6: 137-150.
- GOUZOULES, H., 1975. Maternal rank and early social interactions of infant stumptail macaques, *Macaca arctoides*. *Primates*, 16: 405-418.
- HAMBURG, D. A., 1969. Observations of mother-infant interactions in primate field studies. In: *Determinants of Infant Behaviour*, vol. 4, B. M. FOSS (ed.), Methuen & Co. Ltd., London, pp. 3-14.
- HANSEN, E. W., 1966. The development of maternal and infant behaviour in the rhesus monkey. *Behaviour.*, 27: 107-149.
- HARLOW, H. F., 1971. *Learning to Love*. Albion, San Francisco.
- HENDY-NEELY, H. & R. J. RHINE, 1977. Social development of stumptail macaques (*Macaca arctoides*): momentary touching and other interactions with adult males during the infants' first 60 days of life. *Primates*, 18: 589-600.
- HINDE, R. A., 1965. Rhesus monkey aunts. In: *Determinants of Infant Behaviour*, vol. 3, B. M. FOSS (ed.), Methuen & Co., Ltd., London, pp. 67-75.
- & Y. SPENCER-BOOTH, 1967a. The effect of social companions on mother-infant relations in rhesus monkeys. In: *Primate Ethology*, D. MORRIS (ed.), Aldine Publishing Co., Chicago, pp. 267-286.
- & ———, 1967b. The behaviour of socially living rhesus monkeys in their first two and one-half years. *Anim. Behav.*, 15: 169-196.
- HORWICH, R. H. & D. MANSKI, 1975. Maternal care and infant transfer in two species of *Colobus* monkeys. *Primates*, 16: 49-73.
- ITANI, J., 1963. Paternal care in wild Japanese monkeys, *Macaca fuscata*. In: *Primate Social Behavior*, D. H. SOUTHWICK (ed.), Van Nostrand, Princeton, pp. 91-97.
- JAY, P., 1963. Mother-infant relations in free-ranging langurs. In: *Maternal Behavior in Mammals*, H. L. RHEINGOLD (ed.), John Wiley, New York, pp. 282-304.
- KAWAI, M., 1965. On the social system of ranks in a natural troop of Japanese monkeys, (I)



- basic rank and dependent rank. In: *Japanese Monkeys*, S. A. ALTMANN (ed.), published by the editor, pp. 65–86.
- KAWAMURA, S., 1965. Matriarchal social ranks in the Minoo-B troop: A study of the rank system of Japanese monkeys. In: *Japanese Monkeys*, S. A. ALTMANN (ed.), published by the editor, pp. 105–112.
- KIRK, R. E., 1968. *Experimental Design Procedures for the Behavioral Sciences*. Brooks Cole, California.
- LANCASTER, J. B., 1971. Play-mothering: The relations between juvenile females and young infants among free-ranging vervet monkeys. *Folia primat.*, 15: 161–187.
- LAHIRI, R. K. & C. H. SOUTHWICK, 1966. Paternal care in *Macaca sylvana*. *Folia primat.*, 4: 257–264.
- MITCHELL, G. D., 1969. Paternalistic behavior in primates. *Psychol. Bull.*, 71: 399–417.
- & E. M. BRANDT, 1972. Paternal behavior in primates. In: *Primate Socialization*, F. E. POIRIER (ed.), Random House, New York, pp. 173–206.
- RHINE, R. J., 1972. Changes in the social structure of two groups of stumptail macaques (*Macaca arctoides*). *Primates*, 13: 181–194.
- , 1973. Variation and consistency in the social behavior of two groups of stumptail macaques (*Macaca arctoides*). *Primates*, 14: 21–35.
- & M. FLANIGON, 1978. An empirical comparison of the one-zero, focal-animal and instantaneous methods of sampling spontaneous primate social behavior. (in press)
- & C. KRONENWETTER, 1972. Interaction patterns of two newly formed groups of stumptail macaques (*Macaca arctoides*). *Primates.*, 13: 19–33.
- ROSENBLUM, L. A., 1971. Infant attachment in monkeys. In: *The Origins of Human Social Relations*, H. R. SCHAFFER (ed.), Academic Press, London, pp. 85–113.
- & I. C. KAUFMANN, 1967. Laboratory observations of early mother-infant relations in pigtail and bonnet macaques. In: *Social Communication Among Primates*, S. A. ALTMANN (ed.), Univ. Chicago Press, Chicago, pp. 33–42.
- ROWELL, T. E., N. A. DIN, & A. OMAR, 1968. The social development of baboons in their first three months. *J. Zool. Lond.*, 155: 461–483.
- , R. A. HINDE, & Y. SPENCER-BOOTH, 1964. “Aunt”-infant interaction in captive rhesus monkeys. *Anim. Behav.*, 12: 219–226.
- SADE, D. S., 1967. Determinants of dominance in a group of free-ranging rhesus monkeys. In: *Social Communication Among Primates*, S. A. ALTMANN (ed.), Univ. Chicago Press, Chicago, pp. 99–114.
- SEAY, B., 1966. Maternal behavior in primiparous and multiparous rhesus monkeys. *Folia primat.*, 4: 146–168.
- SPENCER-BOOTH, Y., 1968. The behaviour of group companions toward rhesus monkey infants. *Anim. Behav.*, 16: 541–557.
- STRUHSAKER, T. T., 1971. Social behaviour of mother and infant vervet monkeys (*Cercopithecus aethiops*). *Anim. Behav.*, 19: 233–250.
- WINER, B. J., 1971. *Statistical Principles in Experimental Design*. McGraw-Hill, New York.

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