Dominance in monkeys: Sex differences

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Eight female rhesus monkeys were paired under laboratory conditions for the purpose of dominance determinations. Data from a previous identical study with males were compared with the data obtained here. Males showed a significantly higher incidence of vocalization, fighting and avoidance. Dominance in males seems to depend primarily on the aggressive initiative of the dominant animal. In females, dominance appears to be determined primarily by the initiative of the subdominant animal in avoiding the dominant one.

Social dominance relationships exist in all primates. The hierarchical system which characterizes dominance seems to be expressed most clearly in rhesus monkeys and in baboons, where the defense of the group consists of a combination of aggression and cooperation, since escape into trees is absent (Price, 1967). Behavior associated with dominance in feral primates has been thoroughly studied by many investigators (Carpenter, 1963; Altmann, 1962; Manocha, 1966, among others). Studies on dominance in captive primates are fewer (Ploog, 1966; Angermeier, Phelps, Murray, & Reynolds, 1967; Angermeier, Phelps, Oreste, Davis, & Reynolds, 1967; Angermeier, Phelps, Reynolds, & Davis, 1968, among others).

The study presented here is an extension of previously reported work on social dominance in captive rhesus monkeys and is concerned primarily with the assessment of male-female differences in the establishment of dominance.

METHOD

Subjects

Eight female rhesus monkeys, ranging in weights from 4021 to 5606 g, were used as Ss. Animals were originally obtained from a dealer in India and had been housed in single cages in our laboratory for a period of six months. All animals were experimentally naive and were maintained on a regular diet of daily fresh fruit, laboratory chow and ad lib water.

Apparatus

The dimensions of the clear plastic cage set in a metal frame in which the animals were paired for dominance determinations were 88 x 124 x 186 cm. This cage was placed in an otherwise empty testing room, where Ss could be observed from an adjacent room through a large one-way window.

Procedure

All animals were weighed and divided into two weight-groups: Group 1 contained four Ss weighing between 4021 and 4870 g; Group 2 was comprised of four Ss weighing between 5153 and 5606 g. All animals were paired with all other animals in this order: During the first three days animals from Groups 1 and 2 were paired only with animals coming from their respective weight group; during the last four days, animals from Group 1 were paired only with animals from Group 2. The rationale for this part of the procedure stemmed from a previous observation of the importance of weight differences in dominance determinations which we sought to minimize in this study (Angermeier & Phelps, 1967). Each animal was paired with one other animal only once per day. Thus, a total of 28 pairings occurred. Animals remained in the testing cage between 15 and 30 min, the time interval it took to reach unanimous agreement among four trained observers regarding the results of the test.

RESULTS

Weight differences had little or no effect upon the outcome of the dominance tests conducted here. As observed in an earlier study with male monkeys, however, here, too, no female animal was found to be dominant over another animal when the weight difference was 1000 g or more in favor of the other animal. A summary of the observed behavior and the significant differences between observations of this study and one reported earlier

Table 1
Differences in Dominance Behavior Between Male and Female Rhesus Monkeys

Behavior	Number of Tests in Which Behavior Occurred*					
	Males		Females		t	p
	No.	Per cent	No.	Per cent		
Stalking	14	52	15	56	0.40	NS
Mounting	16	59	9	33	1.89	NS
Grooming	5	19	9	33	1.17	NS
Biting	7	26	7	26	0.00	NS
Vocalization	9	33	1	4	2.06	< .05
Fighting	27	100	4	15	4.21	< .01
Genital Inspection	12	44	5	19	1.84	NS
Sexual Presentation	9	33	4	15	1.43	NS
Baring of Teeth	12	44	5	19	1.84	NS
Avoidance	25	93	17	63	2.11	< .05

*Number of pairings presented here reduced to 27: no interaction in one test.

(Angermeier, Phelps, Murray, & Reynolds, 1967) is shown in Table 1.

DISCUSSION

The most striking contrast in the establishment of dominance between male and female paired rhesus monkeys occurs in the category of fighting. All 27 pairings of male partners produced fights, whereas only four of 27 female pairings resulted in fights. Furthermore, it was observed that in dominance tests involving males, fighting and other forms of aggression were always the first event to take place after the animals were put into the testing cage. This was not true in the dominance tests involving females. The most prominent behavior observed in these situations was avoidance on the part of the subdominant animal. Another observation should be mentioned here. When an extraneous stimulus or threat was introduced into the testing situation (such as handlers entering the room at the end of testing), the subdominant female always moved into close proximity to the dominant animal. This behavior was only rarely seen in males. Generally speaking, it may be said that females are much less aggressive than males when dominance is to be established. The manner in which the two systems of behavior will be integrated when males and females are paired under the conditions described is presently under investigation.

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