An Analysis of Toque Macaque Cohesion Calls from an Ecological Perspective

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The manner in which individuals in social groups space themselves in relation to each other and to other groups partly reflects how they might share limiting resources with one another, select their mates, care for their young, and protect one another against predators or resource competitors. Within most primate societies, not all members are equally privileged in using the groups' available resources, be it food, water, mates, or refuges. Dominance hierarchies, determined by the social histories among group members, reflect which families, peer groups or similar cliques, and which individuals within such subgroupings, are more privileged than others. Competition and cooperation among group members are especially strongly expressed in relation to the exploitation and sharing of food resources. Hence, an individual's choice of social partners, especially during foraging, may strongly influence its chances of surviving and reproducing (Dittus 1977a, 1986).

Much of what primates communicate about concerns the exercise of their particular "rights" in society. To this end, a number of threat and appeasement postures and vocalizations serve as communicative tools to manipulate social partners, particularly at times of conflict.

There exists yet another class of equally important signals that guides individuals in their more or less chronic selections of nearest neighbors. Monkeys, particularly macaques, differ markedly in their individual morphologies and these in themselves act as visual guides. One aim of this chapter is to examine the vocal signals that assist group members in selecting, and in staying close to, their partners in daily social life. These signals concern the structurally and contextually diverse vocalizations that generally have been considered together as types of *cohesion calls, contact calls,* or *coo calls* in a variety of Old World primates (Itani 1963; Lindburg 1971; Green 1975; Struhsaker 1967; Cheney and Seyfarth 1982; Caldecott 1986; Mitani 1986).

I propose that this class of calls constitutes at least three kinds of related signals that might be broadly classified as *contact calls, lost calls,* and *food calls* (Table 1). They share the role of guiding individuals in their selection of social partners. They differ in their additional specialized functions, as will be examined in this chapter.

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Table 1. Physical characteristics of different cohesion call types

Call type	Frequency range (Hz)	Frequency emphasis (Hz)	Duration (s)	Loudness	Sound quality	Pitch trajectory	Figure
Contact calls							
Hum (infant)	0.8–1.0		0.10–0.50	Very quiet	Pure tone	Flat	1A
Hum (adult)	0.3–0.5		0.10–0.50	Very quiet	Pure tone	Variable	1B
Grunt	0.1–1.0		0.10–0.50	Very quiet	Atonal	Flat, broad spectrum	2A
Food call	0.5–4.5	2.5–4.5	0.20–0.50	Loud	Tonal squeal	Sharp rise	3
Lost calls							
Lost-1	0.4–0.8	0.6–0.8	0.40–0.75	Moderately loud	Pure tonal moan	Slight rise and fall	4B
Lost-2	0.5–1.8	>1.0	0.30–0.60	Loud	Tonal yell	Sharp rise and fall	4C
Lost-3							
part 1	0.5–3.0		0.15	Loud	Tonal whistle	Sharp rise	1D
part 2	1.8–0.5	>1.0	0.20–0.35	Loud	Tonal yell	Slight fall	1E
Lost-4							
part 1	1.8–3.5	3.5	0.13–0.16	Very loud	Piercing	Sharp rise	4F
part 2	1.7–0.6	1.7	0.15–0.20	Very loud	Yell	Slight fall	
Whistle							
(adult)	0.5–>5.0	>5.0	0.15	Very loud	Tonal whistle	Sharp rise	4G
(infant)	1.0–>5.0	>5.0	0.20–0.25	Loud	Tonal whistle	Sharp rise	4H
Infant separation calls							
Sep-1	0.70–0.90	Nil	0.8–1.10	Very quiet	Pure tone	Flat	5A
Sep-2	0.70–1.0	1.0	0.8–1.10	Quiet	Tonal moan	Slight rise and fall	5B
Grunt	0.20–2.0	Nil	0.30–0.50	Very quiet	Atonal	Flat, broad spectrum	6