SHORT COMMUNICATION

TRAINING A LARGE TROOP OF RHESUS MACAQUES TO CO-OPERATE DURING CATCHING: ANALYSIS OF THE TIME INVESTMENT

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This study demonstrates that only a minimal time investment was needed to train a large troop of laboratory non-human primates to co-operate in the catching procedure. A group of 45 rhesus macaques (Macaca mulatta) *was trained to enter a chute system voluntarily and be caught one by one. The total duration of the training sessions was under six hours, with less than 15 total work-hours invested by three people. The result was an improved capture procedure which minimized risk to personnel and distress to the animals.*

Keywords: *animal welfare, handling, rhesus macaques, training procedures*

Introduction

Catching individual non-human primates living in group housing can be distressing for the animals and potentially dangerous for the personnel. The procedure often entails the chasing and/or netting of animals. Alternative methods, based on gradual conditioning of the subjects to co-operate during the catching procedure, have been described for stump-tailed macaques (*Macaca arctoides*: Smith 1981; Bunyak *et al* 1982), rhesus macaques (*Macaca mulatta*: Walker *et al* 1982; Clarke *et al* 1990; Reinhardt 1990; Phillippi-Falkenstein & Clarke 1992) and long-tailed macaques (*Macaca fascicularis*: Heath 1989; Boccia *et al* 1992). The present study addresses the questions of the effectiveness of, and time required in, instituting such an alternative capture technique in a large rhesus macaque troop.

Methods

The subjects were 45 rhesus macaques (*Macaca mulatta*) living in an indoor/outdoor run. There were 16 adults (5-26 years of age: 12 females and 4 males) and 29 juvenile/subadult animals (1-4 years of age: both sexes). Five females had young infants. Because the infants were carried by their mothers during all troop movements, they were not considered as subjects in this study.

The outdoor pen had a $75m^2$ impervious floor area; it was 6m high with a mesh-covered roof. The indoor run had a $25m^2$ stainless steel mesh floor area; it was 2m high. The animals had access to both runs via a swinging door. They were habituated to first being locked up outside, then inside during the morning cleaning routine. Fresh biscuits and fruit were distributed in the cleaned outdoor pen at 0915h and the swinging door was opened at 0930h.

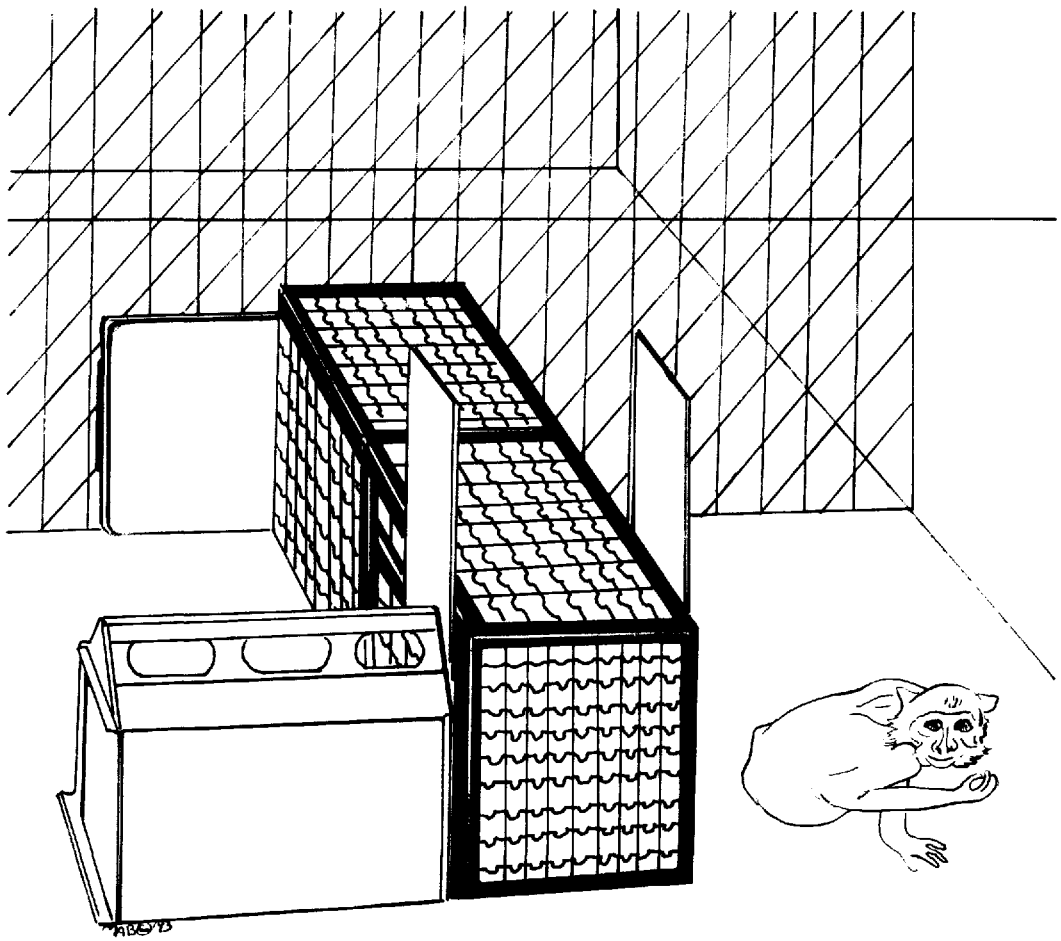

Figure 1 **Chute system installed in indoor run. Animals are confined in holding compartment, in rear, and released through the catching chute. An animal in the chute may exit into a transport cage (left), or be freed to seek exit to the outdoor pen (right). Sliding doors are operated from the left side of the chute.**

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During the conventional catching procedure all animals were confined in the indoor run and subjects were caught one at a time with a net. This process could take an hour or more, and incidents of acute diarrhoea, rectal prolapses and lacerations were common. The procedure involved two or three animal caretakers who were exposed to risk of injury while in pursuit of individual animals in the small indoor run.

As a step towards simplifying the capture procedure, the indoor run was subdivided by wire mesh into a large area and a small, $10m^2$ holding compartment. The holding compartment had a large passage door for animals and personnel. A small opening for animals connected the holding compartment to a heavy-gauge mesh chute mounted on the floor of the large indoor area. The entrance to the chute was controlled by a sliding panel. Two exits at the other end of the chute were controlled by guillotine doors. An animal could be confined in front of the two exits by inserting a dividing panel into the chute. From here subjects could be released to the outdoor pen via the large indoor area and its swinging door, or to an attached transport cage (Figure 1).

The chute system was installed one week prior to the beginning of the training. During the one-week habituation period, the animals had free access to all parts of it.

The training programme involved two or three people (Person A: ethologist studying the troop, Persons B and C: attending animal caretakers). Training was based on patiently conditioning the animals to exit the indoor run through the chute system. Release to the outdoor pen served as reward for co-operation, as it provided access to food and other already released troop members.

Progress of training and results

Each training session was incorporated into the morning animal care routine. Person B normally confined the troop to the indoor run for approximately one hour while cleaning the outdoor pen and distributing fresh biscuits and fruit for the day. Training sessions started thereafter, with Persons A and B inducing the troop to enter the holding compartment of the indoor run. Initially, animals were prompted by shouting and arm-waving. By the second week, the troop was sufficiently conditioned to retreat into the holding compartment whenever Person A or B entered the indoor pen.

During the first two training sessions, all animals crowded through the chute *en masse* as soon as Person A opened the chute exit door. As training proceeded, the crowding was progressively controlled in the following way: Person A enticed the troop to enter the chute by sham-opening the exit facing the swinging door. Animals would dash into the chute only to be trapped in small groups by Person A who quickly closed the entrance and isolated individual subjects in front of the exit by pushing the dividing panel into the chute. Subjects were released after a few seconds and allowed to enter the outdoor pen through the swinging door. By the end of the second week, animals regularly entered the chute one or two at a time (Table 1).

The troop had to exit through a transport cage for the first time in week four. Initially the cage was open on both sides, allowing free passage. None of the animals hesitated to exit through it.

Table 1 **Progression of training programme.**

Week	No sessions	Duration (h)	Work-hours	Goals achieved
1	4	2.00	4.00	Animals exit through tunnel in groups.
2	4	1.67	5.00	Animals exit through tunnel one or two at a time.
3-4	4	1.00	2.84	Animals exit one by one through open transport cage.
5	3	0.58	1.58	All animals caught individually in transport cage.
6	3	0.67	1.50	All voluntarily enter transport cage one by one.
Total	18	5.92	14.92	

At the beginning of week five, the entire troop was caught one animal at a time using the chute system for routine tuberculosis testing, blood collection and weighing. This special occasion was not counted as a training session. The troop exhibited no obvious reluctance to co-operate during a routine training session on the next day.

Most animals stayed in the outdoor pen after exiting but a few consistently attempted to return to the indoor run. To minimize risk to the person operating the chute, Person C was stationed in the outdoor pen to discourage animals from re-entering. This precaution proved to be unnecessary when the alpha male was caught in a transport cage and released only after all other group members had exited.

Sporadically during training some animals were reluctant to enter the chute. It was usually sufficient to patiently wait in order to help such individuals overcome their apprehension and finally walk into the chute. For the first five weeks, animals unwilling to enter the chute were encouraged to proceed by Person B showing a net from behind the door. During the sixth week of training, this was no longer necessary as all animals entered the chute spontaneously or on vocal commands.

The troop was considered to be successfully trained when each of the 45 members voluntarily entered a transport cage attached to one of the chute's exits. The time investment was calculated as total training time (sum total of durations of all training sessions) and total work-hours (sum total of time investment of all persons involved in the training).

The goal of the training was achieved after 5.92 hours, distributed over 18 sessions lasting 10-35 minutes each. The entire training process was spread over a total of six weeks. During the last training session all 45 troop members voluntarily exited the holding compartment one at a time and entered the transport cage. Individuals were released to the outdoor pen after a few seconds. The whole troop was caught in this manner within 15 minutes. None of the animals showed signs of physical distress, such as rectal prolapse or diarrhoea during this procedure. The total training time investment was less than 15 work-hours (Table 1).

Discussion

The present study demonstrates that troops of laboratory rhesus macaques that have been caught by chasing and/or netting in the past can readily be trained to co-operate during routine catching. Using a simple chute system and applying a training technique based on patience, all 45 troop members were successfully conditioned to voluntarily enter a transport cage one by one in less than 15 work-hours. Stress reduction for the animals and risk avoidance for the personnel justify this minimal time investment.

It is expected that using the new technique routinely will maintain the learned behaviour (Boccia *et al* 1992; Reinhardt 1992). As evidence of this, four months after the initial training, all animals in the troop continue to co-operate in one by one catching procedures.

Animal welfare implications

A large troop of rhesus macaques was conditioned to co-operate during swift one by one catching. The time required to catch the entire group, or isolate individuals for treatment, was greatly reduced in relation to that required for the conventional catching procedure. Symptoms of distress due to catching were completely eliminated.

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