A METHOD FOR TRAINING UNRESTRAINED PRIMATES TO RECEIVE DRUG INJECTIONS^{1,2}

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In behavioral experiments with large primates, it may be impractical, or otherwise undesirable, to maintain an animal in a restraining device such as a primate chair, even when frequent drug injections are necessary. To avoid the trouble and the emotional disruption to the animal of capturing it, we have developed a shaping procedure by which a large, aggressive baboon was trained to offer its arm to receive an injection in the biceps muscle.

A 30-pound male baboon was completely maintained in a 60 by 40 by 30 in. experimental chamber in which all of its food was delivered as a result of the procedures scheduled in the experiment. One wall of the baboon chamber ($\frac{3}{8}$ in. Plexiglass) contained a

3½ in. diameter porthole 25 in. above the bedding pan on the floor of the cage. The baboon was trained to extend its arm through the porthole. The training procedure was begun by holding a slice of fruit in front of the porthole and giving it to the animal when it extended its arm through the opening. Then, the fruit was given only when the arm was fully extended, and later, held quietly for a number of seconds.

On the trials which followed, the baboon was required to maintain this behavior while the experimenter touched its arm in a progression of closer approximations to drug injection. The baboon was given fruit after each satisfactory extension. Reinforcement was withheld if the wrong arm were extended, or if the arm were bent or withdrawn in any degree in response to tactile stimulation by the experimenter.

The procedure was carried out in roughly three stages in which the experimenter first touched, and later held the baboon's wrist with his left hand; second, touched the biceps muscle with his right hand, and then with the syringe, while holding the animal's wrist firmly; third, made injection contacts in which the syringe and needle were placed against the arm and finally inserted into the muscle. The application of the shaping procedure was complicated by the animal's attempts to grab or strike the experimenter in response to the experimenter's making a sudden novel movement, pulling its wrist or hurting it with the needle. Only two experimental sessions were required before we could hold the needle against the animal's biceps. Emotional displays and withdrawal of the arm occurred more frequently after the first penetration of the needle; however, the behavior was brought well under control when a special procedure for inserting the needle was begun. The experimenter would press down progressively harder

Fig. 1. The baboon receiving an injection.

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on the biceps muscle with the *side* of the needle, then slowly slide the point forward into the muscle while maintaining the lateral pressure. The *point* of the needle was not in contact with the skin until the forward move to insert it was made. After insertion, the needle was held in the muscle for successively longer periods; then, an actual injection was performed.

The shaping procedures were applied for approximately 1 hr on alternate days while the animal was run in an ongoing experiment. The amount of food delivered during the experiment, however, was reduced from the normal amount delivered. It was judged that the

increased level of deprivation (the animal was normally at free-feeding weight) was necessary to maintain the reliable arm extension during the training sequence.

Satisfactory injection was reliably obtained after approximately three weeks of training. Two different experimenters administered the procedures, but the baboon accepted the changes with little disruption. The injection procedure was used successfully to administer both active and control compounds. Figure 1 is a photograph of the baboon receiving an injection. Similar procedures have been used by the second author to draw blood from chimpanzees via finger punctures.