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EFFECT OF FOOD REWARD ON THE MAINTENANCE OF SUCKING BEHAVIOR DURING INFANCY

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Sucking has long been considered an important area of infant behavior on both theoretical and practical grounds (Ross, Fisher, & King, 1957). Much of the early writing was concerned with the controversy as to whether sucking was the expression of an unlearned or acquired oral drive. Of the few studies in the area, the one by Davis, Sears, Miller, and Brodbeck (1948) with human babies offered the strongest support for the acquired drive hypothesis. More recently, additional support has been provided by a similar study on infant monkeys (Benjamin, 1961). In both cases, however, the acquired drive hypothesis was only partially supported.

The core of the acquired drive hypothesis is that sucking acquires drive properties through its close association with food reinforcement. This implies that the milk normally obtained by sucking is critical for the maintenance of sucking behavior, if sucking is to be conceived as a drive acquired on the basis of food reward. This experiment was designed to investigate the extent to which the development and maintenance of sucking depends on the milk, or food reward, normally obtained by sucking.

In investigating this question a longitudinal study of 10 kittens was conducted from birth to 6 mo. of age. The kittens were reared under two conditions, such that five received milk for sucking and five did not. At present only the data from the first 6 wk. of life, which constitutes the preweaning period, will be reported.

METHOD

Subjects

The *S*s were 10 kittens selected from the litters of seven different females. Three different litters were represented in the group which received milk for sucking and four in the group which did not. In every case the kittens were removed from their mothers shortly after birth, before any of them had actually started nursing. The kittens were housed individually in boxes during the first 6 wk. Cloth covered heating pads on the floors of the boxes provided the warmth necessary for maintaining them.

Procedure

In order to provide proper nourishment and still control sucking experiences, all kittens were fed every 4 hr. by a stomach loading technique. This was continued until they reached 6 wk. of age, at which time they were allowed to eat and drink normally.

The procedure followed at each feeding started with weighing the kitten. Then a tube was inserted into the stomach by way of the mouth and the requisite amount of Esbilac (simulated bitch's milk produced by Borden Co. for puppies and kittens) was slowly injected. After this the kitten was returned to his box and another was fed. The amount given each kitten was determined by the amount ingested at that feeding by a littermate control, who was fed as much Esbilac as desired from a small nursing bottle. When all the kittens had been fed, the genital area of each was stimulated by stroking with a soft brush in order to initiate urination and defecation.

In an attempt to keep the experimenter-produced stimulation about the same in the two rearing groups, each kitten in one group was matched with a kitten in the other group. For each feeding the pairs were treated similarly with respect to the amount of time the tube was left in the stomach and the overall amount of time they were held by *E*. Between feedings the kittens were left alone except for occasional health checks and the administration of the following conditions:

Each day in the first 6 wk. all kittens were given an opportunity to suck for approximately 6 hr. a day. During this period one rearing group, which may be called the milk-sucking group, was put with a normal lactating female cat and allowed to suck at will. During the same time the other rearing group, which may be called the dry-sucking group, was put with an adult female cat who was not lactating. This group was also allowed to suck at will but of course no milk was forthcoming. To prevent this cat from interfering with the kittens' attempts to suck, she was given an injection of pentobarbital sodium (.6 cc/kg) sufficient to render her immobile for most of the 6-hr. period. Thus, for both groups the sucking stimulus situation was as close to normal as possible except that sucking produced milk for only one group. Two kittens in each group did not begin these daily sucking sessions until their second day of life though they were removed from their mother at birth. After the kittens were 6 wk. old they were given these opportunities to suck for only 2 hr. per day, 5 days a week.

The fact that the dry-sucking group did not have an active mother did not appear to retard the nuzzling and sucking behavior of these kittens. Further, the mother cats in the milk-sucking group were not very vigorous in their mothering activities so that the sucking situation was relatively similar for the two rearing groups.

The daily sucking experience was initiated approximately 2 hr. before the 2:00 P.M. feeding and was terminated slightly before the 6:00 P.M. feeding. During this time the kittens were systematically observed for 3 hr. a day from birth to 6 wk. of age.

Specifically, the kittens were observed in the 2 hr. just preceding the 2:00 P.M. feeding and in the first hour just after the 2:00 P.M. feeding. For each kitten the time during which his mouth was closed over a nipple was recorded on a cumulative stopwatch for each hour of observation. For purposes of discussion this may be called a measure of sucking time, though a kitten may not have been actively sucking during the whole time that his mouth was on a nipple. In addition, various items of behavior were observed and recorded on the basis of 30-sec. intervals scored consecutively during each hour. These data are not included in this report.