INTRODUCTION

Female rats which differ in open field behavior (Ottinger, Denenberg & Stephens, 1963) or which have been differentially stressed prenatally (Thompson, 1957) or postnatally (Denenberg, Ottinger & Stephens, 1962) have been shown to produce offspring which differ systematically in subsequent behaviors, particularly those relating to emotionality. It is possible that these differences are produced by differences in maternal behavior toward the young. Seitz (1954) found an inverse relationship between litter size and a global rating of maternal behavior, and also reported relationships between litter size and offspring behavior. Unfortunately, these differences could not be attributed to differences in maternal behavior because of the confounding of maternal behavior and litter size. Ottinger, et al. (1963), using measures of maternal behavior adapted from Seitz (1954, 1958) found no difference between Wistar mothers of varying emotionality levels or rotated vs non-rotated mothers. Possibly differences in maternal behavior might be found if more heterogeneous groups of mothers were compared. Strain differences in maternal behavior have been demonstrated in rabbits (Sawin & Crary, 1953) and in mice (Ressler, 1962). The present study was carried out to ascertain whether or not strain differences in the maternal behavior of rats could be identified. Maternal behaviors of three strains of rats were compared. Strain of offspring reared was also varied to determine whether this would affect maternal behavior.

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Subjects

Subjects were 26 primiparous rats between 120 and 140 days of age at breeding. Ten were of Long Evans stock, nine were Wistars, and seven were Sprague-Dawleys.

METHOD AND PROCEDURE

Twenty-four to 48 hours after birth, litters were removed from the dams, and replaced by foster litters of six. Each strain of mothers was split into three subgroups, such that approximately one-third reared Long Evans pups, one-third Wistars, and one-third Sprague-Dawleys. Mothers and pups were not handled or moved from the time they were cross-fostered to weaning at 22 days of age. They were reared on wire in plexiglass cages 10 in. wide, 10-1/2 in. high, and 13-1/2 in. deep. Food was placed in the cages every day, and water changed as needed.

Mothers were observed daily for 20 days following cross-fostering, using three scales derived from SEITZ (1958). These consisted of ratings on a five-point scale of the extent to which the litter was ordered, the degree of physical contact maintained by the mother with the litter, and the extent to which the dam participated in nursing as indicated by her body position. Specifically, with regard to ordering, scores were assigned in terms of piles and strays. A pile was defined as three or more pups in contact with one another, or in close proximity (no more than one-half of an inch apart). A stray was defined in one of two ways: Two pups in contact with one another or in close proximity to each other, but isolated from other pups, were scored as two strays, a single pup in close proximity to no other pup was scored as a stray. Points were given as follows: Four points if the pups were grouped into one pile, three points if the pups were arranged in a pile except for a single stray, two points if the young were grouped into two piles, one point if there was one pile and two or three strays, and no points if the pups were scattered, meaning that there were four or more strays. With regard to physical contact, points were assigned as follows: Four points if the dam was in contact with all pups, three points if she was in contact with all except one or two, two points if she was in contact with three, one point if she was in contact with only one or two pups, and no points if she was not in contact with any of them. In order to be considered in contact, the dam had to be touching the body of the pup with her body. No points were given if merely the feet or tails of the animals were touching. With reference to nursing, four points were given if the mother was in the following posture: At least from the shoulders back she was in an upright position, the belly was slightly raised, resulting in an arching of the back, and the two back legs were spread apart,