

THE ROLE OF STIMULATION IN THE DELAY OF ONSET OF CRYING IN THE NEWBORN INFANT

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Crying is said to result from stimulus need. An experiment was done in which infants were stimulated during quiet periods to see if this would postpone the onset of crying. The results were positive. An alternative explanation in terms of internal temperature control is considered.

INTRODUCTION

Crying in the human infant has been treated either (1) as a reaction to an unpleasant external stimulus, or (2) as a response to an internal need. Point (1) is illustrated by Skinner's observation (1959, p. 420) that he was able to reduce the amount of crying of his own child by keeping it in a compartment in which the temperature was held constant and the child could move about without the constraints of clothing. Point (2) is illustrated by the terms "stimulus need" and "stimulus hunger" which have been used by investigators who are concerned with the kind of stimulation required for normal development in both humans and animals (Thompson, 1955, p. 133). Presumably the infant requires varied stimulation, the kind and quantity of which changes as the child grows. Crying can be regarded as an index of the absence of such stimulation.

Crying occurs fairly regularly in the human infant before feeding. It also occurs, though less frequently, when there is no obvious indication of discomfort: the child need not be windy, wet or in discernible pain. In the newborn infant, one of the first efforts which the mother makes to stop the infant from crying is to rock it. Sometimes this is successful and the infant drops off to sleep again. By analogy with hunger, the need involved is reduced. If it is not other efforts will be made to find out why the baby is crying and how to stop it.

Since rocking seems an effective means of stopping the baby from crying when it is not hungry or in pain, it would appear to answer to some of the stimulus needs of the young infant. If it can be effective in stopping the infant from crying, rocking the child before it cries should prevent or delay the infant's crying effectively. That is to say, if crying can result from stimulus hunger then appropriate stimulation should put off the onset of crying. The following experiment was done to test this hypothesis.

EXPERIMENTAL METHOD

The experiment was carried out in the nursery of one of the wards of an obstetrics hospital. All the children here were full term babies. They were placed in the nursery for about 1½ hours after their noonday feed, the only time during the day when they were together and away from the bedsides of their mothers.

Each day the number of babies in the nursery who were not crying was counted and one baby was selected for rocking; the remaining babies who were not crying formed the control group. The experimenter stood at the foot of the cot and rocked the baby in it for half an hour. After this the experimenter remained in the nursery for half an hour. The number of control babies who cried during the hour the experimenter was present was noted.

The cots were numbered by the experimenter and each day the number of the cot selected for rocking was moved up by one. If the baby whose turn it was to be rocked was already crying, the number was moved up by one or to the next baby who was quiet.

The experiment was carried out for 18 days between 25th May and 24th August, 1964. The maximum number of babies in the nursery on any one of these days was 11; the minimum number was seven. The maximum number of babies who could be used for the experiment, that is, the number of quiet babies, was 10; the minimum number of quiet babies was six. The ages of the babies ranged from a few hours to 10 days.

RESULTS

The results are listed in Table I.

TABLE I

Day	Control babies	Control babies who cried	Experimental babies	Experimental babies who cried	Proportion control babies not crying	Proportion experimental babies not crying	Difference in proportion
1	8	5	1	0	0.37	1.00	0.63
2	6	4	1	0	0.33	1.00	0.67
3	5	4	1	0	0.20	1.00	0.80
4	6	5	1	1	0.16	0	-0.16*
5	5	1	1	0	0.80	1.00	0.20
6	9	5	1	0	0.44	1.00	0.56
7	8	3	1	0	0.62	1.00	0.38
8	8	4	1	0	0.50	1.00	0.50
9	5	2	1	0	0.60	1.00	0.40
10	9	1	1	1	0.88	0	-0.88
11	6	1	1	0	0.83	1.00	0.17
12	9	1	1	0	0.88	1.00	0.12
13	8	3	1	0	0.62	1.00	0.38
14	5	1	1	0	0.80	1.00	0.20
15	6	2	1	0	0.66	1.00	0.34
16	8	1	1	0	0.87	1.00	0.13
17	6	2	1	1	0.66	0	-0.66
18	8	3	1	0	0.62	1.00	0.38

* On this day the outdoor temperature had dropped from 72° F. to 52° F. The heating in the nursery was not turned on until very close to the end of the observation period.

The null hypothesis, that the experimental babies did not differ from the control babies, would be substantiated if the differences in proportion were not significantly different from zero. A t-test gave a probability of approximately 0.02 (1-tailed). A correction for skewness increases the probability to between 0.03 and 0.04.

DISCUSSION

The results of the experiment give reasonable evidence that rocking answers some need of the newborn infant since it not only stops crying which has begun but effectively delays its onset. Two possible explanations for what this "need" is present themselves. It could be (1) that the newborn infant requires kinaesthetic stimulation or (2) that further, this kinaesthetic stimulation is a means of helping to regulate the internal temperature of the infant.

Before the experiment was begun a period of time was spent observing the babies on the ward and in the nursery. From these observations there seems little doubt that, once crying has begun, lifting and holding the infant is a more reliable way of stopping its crying than is rocking. Had it been practicable to use holding as the experimental variable the incidence of crying in the experimental babies might have been even further reduced. Lifting and holding the infant might be more effective in stopping crying because the positional change is more marked. Equally, or more important, may be the warmth which the infant gets from the contact with the adult's body. Since internal temperature regulation is not stable in the first weeks of life a lowering of the internal temperature may well account for the onset of crying in what otherwise appear to be periods free from discomfort. Unfortunately, in this experiment the temperature in the

nursery was not recorded until the eighth day. However, the outdoor temperature was fairly steady in the first three days (70° F. on day 1, 70° F. on day 2 and 72° F. on day 3). On day 4 the temperature had dropped 20 degrees, to 52° F. and the nursery was unheated until close to the end of the experimental period. The high incidence of crying on that day (only one baby remained quiet) lends some support to the explanation that internal temperature affects the onset of crying.

The crying itself is vigorous and involves movement of the whole body of the infant, especially its head and limbs. One might therefore regard it as the infant's means of attempting to restore its internal temperature or of supplying its need for positional change. However, the infant is very limited in its capacity for movement and in its capacity to restore its temperature equilibrium. Crying would therefore appear to occur when the infant is in need of stimulation which it cannot adequately provide for itself. In this sense it is the infant's chief means of communication about its needs. Under normal conditions the mother's response to her crying infant will ensure that whatever alterations are required will be made.

It had been considered possible that the cessation of rocking might be frustrating to the infants, and lead to crying. In the event, any such effect was overridden.

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