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Ten normal white babies of middle class parents from the United States and 11 from Holland were observed for one 3-hour period every 2 weeks for the first 3 months of life. The observation form called for an observation about every 5 minutes, about 36 observations per visit. Although all the data on the American babies have not been completely analyzed, some results are available. The early environments of the Dutch and American babies were different. The Dutch babies were kept in a cool room and dressed more heavily than the American babies, who were kept in warmer rooms. The Dutch mothers spent less time responding to their babies than American mothers but did tend to respond to boys more than girls. The feeding schedule for Dutch babies was more rigidly structured and the feeding time was shorter than for the American babies. It was found that those babies in the Dutch sample whose mothers performed the most actions towards them tended to do less negative vocalizing. U.S. babies tended to make more pleasant vocalizations than Dutch babies. The Dutch babies sucked their thumbs more than U.S. babies. The relatively infrequent interaction of Dutch mothers with their babies and the lack of visual stimulation in the babies' environments do not appear to produce any damage in the Dutch children, however, contrary to the predictions of some theorists. (WD)

INFANCY IN HOLLAND: THE FIRST THREE MONTHS

Freda Rebelsky and Gina Abeles

November 1, 1968

Attached is a revision of the earlier publication of "Infancy in Two Cultures," from the Nederlands Tijdschrift voor de Psychologie, June, 1968, 12, 379-385, which was published while the senior author was at the Paedagogisch Instituut in Utrecht. That article was written before statistical analysis of the data had been undertaken, and was published as a preliminary report.

The statistical analysis of the data on the Dutch sample of 11 babies has now been completed; the attached revision incorporates some of the research findings from the data analysis.

This article will be submitted to Developmental Psychology.

A shorter version of this article has been submitted for presentation at the Society for Research in Child Development meeting in March, 1969.

INFANCY IN HOLLAND: THE FIRST THREE MONTHS[1]

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PROBLEM

In recent years there has been an increased interest in infancy and in the relationship between infantile experience and later development. Freud, Erikson, and others have suggested that certain personality development is set in the first few months. Piaget, Hunt, and a large group of American experimenters believe that perceptual and intellectual development may have important roots in early infant experience.

Although many theorists posit the importance of infancy, very few studies of the environment of babies have been attempted. Most data on infancy come from data gathered in unusual situations (e.g., hospitals or laboratories), from data gathered in parental interviews, or from records kept by interested parents. All these three types of data have been frequently criticized.

A baby in the first three months is usually confined to its home. In order to talk realistically about the effects of early experience on a variety of later behaviors, it is important to assess the influence of selected dimensions of the home environment upon the baby.

METHOD

In both the United States and the Netherlands, babies were seen in their homes during the first three months of life. Each baby was observed for one three hour period every two weeks for the first three months after birth. Thus each baby was observed on six occasions for a total of 18 hours. E sat outside the babies' perceptual field.

All observations were done on a standard observation form, calling for one observation approximately every 5 minutes. The form contained

[1]This project was funded under Contract 4116 from the Office of Economic Opportunity to the Boston University Head Start Evaluation and Research Center.

categories for the baby's behavior and for the behavior of any caretaker. In addition, a variety of dimensions of the physical environment, such as type of bed, temperature of room, time out of bed, types of toys and their distance from the baby, were rated, High reliability (over 90% congruence) was easily obtained between two trained observers, both in the United States and in the Netherlands since the form contained easily scorable categories. (See Rheingold, 1960, for a precursor of the form used; and Lenneberg, Rebelsky, and Nichols, 1965, for the use of the form in a larger study of infant vocalizations).

SAMPLE

The sample consisted of 10 normal, full-term, white, winter-born babies in the United States and 11 in the Netherlands. They were born into lower-middle to upper-middle class families with existing children. American babies were from the environs of Boston: Dutch babies from Enschede and Hengelo. The samples were as closely matched as possible for family size, sex of child, and occupation of father. There were some differences, however, such as the greater education of American mothers, and the fact that most (9 out of 11) of the Dutch babies were born at home whereas all the American babies were born in hospitals.

In both cultures the sample was obtained through professional contacts, pediatricians in the U.S. and nurses in Holland. Pregnant mothers were asked to participate if they already had other children. The research was presented to the mothers as a general study of how babies live, what they do, how they sleep, etc. with the explanation that such basic data are not as yet known. E explained that she did not want to interfere in any way with the mother's schedule and that no changes

in the baby's normal environment should be made for E's convenience. For example, many Dutch mothers felt pity for E sitting three hours in a cold room and wanted to put on a heater. Since this might have affected the baby in unknown ways or lead to other changes in maternal practices, E asked that this not be done. The mothers were very cooperative, and some tried to recruit other mothers for the study. Mothers were not paid, but E promised to inform them of the results of the study and a small gift was given to the baby at the last visit.

RESULTS

The results presented below include general comparisons between the Dutch and American babies, and statistical comparison of the 11 babies within the Dutch sample. Detailed comparison between the Dutch and American babies is not possible at this time because the data analysis on the American babies has not yet been completed.

In general, Dutch and American babies seem to have very different experiences in the first three months of life. Not only are the two environments physically dissimilar, but there are also differences in the amounts of maternal caretaking. Both of these differences, in physical environment and in caretaking, will be described separately.

The Physical Environment

A Dutch baby sleeps in his own bed in his room, and so does an American baby, though these sleeping arrangments are rare amont the world's cultures. However, a Dutch baby's bed is usually a low closed one, with a canopy overhead, and the U.S. crib is usually higher and open on the sides and above. Dutch rooms are kept cool for the babies; American rooms are kept warm (in each instance, for health). Therefore, Dutch babies

are tightly covered under blankets and American babies have few, if any, blankets, and have more opportunity for movement.

Most American babies have toys in their cribs from the first weeks. By three months, only 6 of the 11 Dutch babies had toys within sight or touch, and only two Dutch babies had a toy as early as 2 weeks of age.

Since the baby's room is cold in Holland, Dutch babies are often fed or bathed in rooms other than where they sleep. In America, babies were more often fed and bathed in their bedrooms. Dutch babies were in their beds more of the time than U.S. babies, who often spent time after feeding propped up or sitting on a reclining chair.

Caretaking: General Considerations

In both cultures, there is one main caretaker, the mother. Most of the mothers breast fed for some time (8 in Holland, 7 in the U.S.), though American mothers tended to breast feed for more months (5 out of the 8 Dutch and 2 out of the 7 American breast-fed babies were on the bottle by 6 weeks). Regardless of the feeding method, feeding time for a Dutch baby averaged 13.6 minutes (somewhat longer, 17.7 minutes, for breast-feeding than for bottle feedings, 10.8 minutes), while the U.S. average was 30 minutes. Length of feeding was often prescribed by a doctor in Holland, while in the American sample the mothers were told to judge for themselves according to the babies behavior.

Every Dutch baby was fed on a schedule, 3 hours apart at the start, moving to 4 hour feedings generally by the end of the first month. Most American babies (8) were not on a pre-set schedule, and were fed "on demand," though by the second month the babies were asking to be fed at

regular times, though the interval between feedings varied. The two U.S. mothers who scheduled feedings were not as regular as the Dutch mothers tended to be. Some Dutch mothers varied as little as ± 5 minutes around the prescribed feeding time. Pre-set feeding times meant that Dutch babies were more frequently woken from sleep for a feeding than were American babies and more frequently fell asleep while feeding.

Mothers' Responses to Crying. U.S. mothers tended to hear their babies crying and responded to the cry, whereas in Holland mothers often couldn't hear the crying (since the bedroom door was shut and the mother was in another room with the door shut) or didn't respond if the crying was heard. The cultural views differ: crying meant a call for help to U.S. mothers; they often reported lactating when they heard the cry. In Holland, crying was considered a part of a baby's behavior, good for the lungs and not always something to stop. In addition, though a mother might hear the cry in Holland and interpret it as a hunger cry, she still would not respond if it was not time for the scheduled feeding.

Of the 290 negative vocalizations (whines, fusses, or cries) made by the 11 Dutch babies in all, their mothers responded to 31 (10.7%).[2] There were differences between individual babies in levels of fussiness, but no relationship was found between the responsiveness of mothers of high fussers (6 babies with highest proportion of fussing) compared with mothers of low fussers (p=.61). A trend was found between the mothers of boys and the mothers of girls: the mothers of the 5 boys tended to respond to a higher percentage, 14.5% (17 of the 117 negative vocalizations),

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[2]In all instances where we have summed observations across babies, the data are not accountable from one or two mothers, but rather represent the group. In the one instance where this was not true, it is mentioned in the article.

than the mothers of the six girls, who responded to only 8.1% (14 of the 173 negative vocalizations ($p < .10$).

One might ask if the Dutch mothers were consistent over time in their responsiveness to their babies' cries, i.e., did they respond to a higher, lower, or the same general proportion of cries as their babies got older. Looking at the sample as a whole, no change in responsiveness of the mothers was found ($p=.39$). However, there was a slight non-significant trend for mothers of boys to respond to a smaller proportion of cries with increasing age from 2-12 weeks ($p=.24$) and a tendency for mothers of girls to respond to a larger proportion ($p=.20$).

Mothers' Behavior to Babies. American mothers looked at, held, fed, talked to, smiled at, patted, and showed more affection to their babies more often than did Dutch mothers. U.S. and Dutch mothers did not differ in amount of time spent adjusting, rocking, nodding, or playing with the baby. The rank order of the behaviors was similar across cultues, though the frequencies differed. For example, all mothers tended to look at a baby more than they held it.

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Insert Table 1 here

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Table 1 indicates the means and ranges for various caretaking items. Possible range is from 0-36 (that is, the 36 observations in a single visit). As can be seen, U.S. mothers tend to have higher frequencies of interaction with their babies than do Dutch mothers, and tend to increase their vocalization over time, unlike the Dutch mothers.

In general, too, the ranges of behavior tended to be larger for U.S. mothers than Dutch mothers. Many of the Dutch mothers responded to

Table 1

MEANS OF DUTCH AND U.S. MOTHERS
FOR VARIOUS CARETAKING ITEMS

	U.S. baby (N=10)		Dutch baby (N=11)		U.S.-Dutch Differences	
	2 wks	12 wks	2 wks	12 wks	2 wks	12 wks
1) Look at	8.3	8.3	7.4	4.2	.9	4.1
2) Hold	6.2	5.5	4.4	2.7	1.8	2.8
3) Feed	4.0	4.3	4.0	1.7	.0	2.6
4) Vocalize	3.4	5.3	3.8	2.8	-.4	2.5
5) Diaper	1.9	1.0	1.0	.7	.9	.3
6) Adjust	1.0	.7	1.4	.7	-.4	0
7) Smile	1.6	2.1	.3	.5	1.3	1.6
8) Pat	1.8	2.1	.6	.2	1.2	1.9
9) Show affection	1.1	2.0	.3	.2	.8	1.8
10) Rock	.3	.6	0	0	.3	.6
11) Nod	0	.8	0	.2	0	.6
12) Play	0	.7	.1	.3	-.1	.4

RANGES OF DUTCH AND U. S. MOTHERS
FOR VARIOUS CARETAKING ITEMS (POSSIBLE RANGE 0-36)

1) Look at	2-16	2-14	6-9	1-8
2) Hold	2-11	1-12	2-7	0-5
3) Feed	1-7	0-8	2-6	0-3
4) Vocalize	0-10	1-11	2-7	1-6
5) Diaper	1-4	0-4	0-2	0-2
6) Adjust	0-4	0-3	0-2	0-1
7) Smile	0-7	0-7	0-1	0-2
8) Pag	0-6	0-6	0-0	0-1
9) Show affection	0-4	0-6	0-1	0-1
10) Rock	0-2	0-3	0-0	0-0
11) Nod	0-0	0-5	0-0	0-1
12) Play	0-0	0-5	0-1	0-1

the baby with identical amounts of caretaking behaviors. This was clearly seen also in their performance of various activities. For example, bathing in the U.S. started with various parts of the baby. In Holland, bathing was done always from the head of the baby to the feet.

The relationships between the actions the mothers performed to the baby and the baby's behavior were analyzed, with the behavior of the mothers categorized into looking, vocalizing (including the one example of singing to the baby), showing affection (which includes nodding, smiling, playing), feeding, and physical contact (which includes diapering, adjusting, patting, and any holding other than during feedings). Of the 16 tests of significance run between mothers' behavior and babies' behavior, only one relationship showed any promise. This may be because the range of frequencies of the Dutch mothers' behavior was too small to have a differential effect on the behavior of the babies. The effects of differences in frequencies of maternal behavior to the babies may appear between the Dutch and American samples when the data on the American babies has been analyzed. The one relationship observed within the Dutch sample which approached significance was that those babies whose mothers performed the most actions (a raw count of all behaviors in all of the categories mentioned above) tended to do less negative vocalizing (whining, fussing, and drying) during their waking hours ($p=.18$).

In general, U.S. mothers psent more time with their babies than did Dutch mothers. In addition, the American mothers spent more time with their babies at three months than at two weeks, especially increasing in talking to the baby. As shown in Table 2, the Dutch mothers spent decreasing amounts of time with their babies as they got older.

Table 2

Proportion of Time Babies Are Awake

That Dutch Mothers are With Babies

Age	Proportion
2 weeks	42.6%
4 weeks	38.9%
6 weeks	50.0%
8 weeks	47.2%
10 weeks	35.9%
12 weeks	30.0)

(r_s =-.54, p = .14, one-tailed)

There was a slight tendency for the mothers of boys to spend more time with their babies than the mothers of girls (p = .18).

The Babies

These twenty-one babies were all normal, healthy infants. Despite the differences in stimulation from the environment, both groups of babies slept about the same amount of time (46.7% for the Dutch sample). When Dutch babies were awake, they often played with their hands, gazed at the meeting point of crib and canopy or slats and material, or cried. American babies, when awake, played with their toys (e.g., banged their feet to make a mobile move), looked through the slats of the crib or at its contours, or played with their mothers. In both cultures, when a baby had a toy, he tended to "talk to it" by 2 to 2 1/2 months.

Vocalization. U.S. babies made more pleasant vocalizations, such as coos, than Dutch babies, but whether this is due to the presence of more objects to vocalize to (such as people or toys) or to the greater

amount of vocal stimulation from the mother is unknown.

The Dutch babies were quiet about half the time they were awake (53.0%) and did not change in this respect with increasing age from 2-12 weeks (p=.45). The vocalizations of the babies during the remaining 47.0% of their waking hours were categorized as positive (cooing), negative (whining, fussing, and crying), and neutral (vegetative groans and burps). The frequencies and relative proportions of these three categories of vocalizations are shown in Table 3 for the sample as a whole, and for the boys and girls separately.

Table 3

FREQUENCIES AND PROPORTIONS FOR EACH CATEGORY OF BABIES" VOCALIZATIONS

Vocalization	Boys (N=5)		Girls (N=6)		Total (N=11)	
Positive	16	(5.5%)	10	(3.4%)	26	(4.4%)
Negative	117	(40.3%)	173	(57.7%)	290	(49.2%)
Neutral	156	(54.2%)	116	(38.9%)	272	(46.4%)
Total	289	(100.0%)	299	(100.0%)	588	(100.0%)

$X^2 = 17.92$ ($p < .001$, df=2)

The boys cooed more than the girls and made more vegetative groans and burps than the girls. The girls did more whining, fussing, and crying than the boys. It seems that the girls, who were generally quieter than the boys (5 of the 6 quietest babies were girls), were more likely to fuss or cry when they stopped being quiet. As stated earlier, there was a slight ($p < .10$) tendency for mothers of boys to be more responsive to the cries of their babies.

There thus seems to be a series of interrelationships between amount of vocalization, proportion of negative vocalization to total vocalization, being a girl, and having an infrequently present mother. A comparison of boys' and girls' amounts of total vocalizations proportionate to amount of time they were each awake showed girls lower than boys (p=.06). A comparison of boys' and girls' proportion of negative vocalizations to total vocalizations showed girls higher than boys (p=.17). A comparison of low and high vocalizers' proportions of negative vocalizations per total vocalizations showed low vocalizers had a higher proportion of negative vocalizations (p=.17). A comparison of frequently and infrequently present mothers with high and low vocalizers showed mothers who were infrequently present had babies who were low vocalizers (p=.17). A comparison of frequently and infrequently present mothers with high and low proportions of negative vocalizations to total vocalizations showed mothers who were infrequently with their babies had babies whose proportion of negative vocalizations to total vocalizations were higher (p=.17). A comparison of frequently and infrequently present mothers with boys and girls showed mothers of girls to be less frequently present (p = .17).

There was also a relationship between vocalization and sleep, i.e., the high vocalizers tended to sleep more (p=.07). Since the low vocalizers tended to be girls, one might wonder if boys slept more than girls. There is no support for this conclusion.

The babies showed a slight tendency to do less whining, fussing, and crying with increasing age from 2 to 12 weeks (p=.20). This tendency was more true for the boys (p=.05) than for the girls, who showed no change (p=.44).

Amounts of Vocalization as Related to Mother's Presence. The Dutch babies made significantly more vocalizations when their mothers were absent than when they were present ($p < .0001$). The frequencies are shown in Table 4.

Table 4

Presence and Absence of Mothers as Related to Babies' Vocalization and Silence (Units are observations)

	Mother Present	Mother Absent	Totals
Vocalization	169	419	588
Silence	337	332	659
N =	506	741	1247

(N = total number of observations when babies were awake.)

$X^2 = 62.25$ ($p < .0001$)

That the girls were even quieter (76.5% of the time the mothers were present) than the boys (50.7%) in the presence of their mothers is indicated by the Chi-square analysis of each sex separately (for the 6 girls, $X^2 = 56.16$, $p < .0001$; for the 5 boys, $X^2 = 8.3$, $p < .005$).

This relationship holds true for the babies at each age of observation as well, i.e., for each age, babies are significantly quieter in their mothers' presence: at 2 weeks, $X^2 = 8.83$ (p .005); 4 weeks, $X^2 = 11.91$ ($p < .0005$); 6 weeks, $X^2 = 9.92$ ($p < .005$); 8 weeks, $X^2 = 15.22$ ($p < .0005$); 10 weeks, $X^2 = 14.00$ ($p < .005$); and at 12 weeks, $X^2 = 3.95$ ($p < .025$) (one tailed probabilities).

This can also be restated in percentages: of the time when the mothers were present, the babies vocalized only 33.4% of the time and were silent the remaining 66.6% of the time. Of the time when the mother was absent, the babies vocalized 56.2% of the time and were silent 43.7% of the time.

When Chi-squares of infant vocalization and mothers presence were calculated separately for each of the 11 babies, all were in the same direction (i.e., quieter in mother's presence) and ranged from $<.15$ to $<.0005$.

There was no difference in the amounts the babies vocalized in mothers' presence or absence, of the mothers who were most and least frequently with their babies. This is true both when considered as proportion of the vocalizations babies made which occur in her presence ($p=.39$) or when considered as the proportion of time mothers were present that the babies vocalized ($p=.61$). It is expected that a comparison between the Dutch and American samples may show some differences between general frequency of maternal presence and differential amounts of babies' vocalization made in her presence compared with in her absence.

Those Dutch mothers who were seen more often by their babies were, however, cooed at by their babies more ($p<.10$, one-tailed). Thus, although all the Dutch babies were significantly quieter when their mothers were present compared with when she was absent, those whose mothers had been with them most over time, coo at them more.

This finding may be related to the sex difference already noted: that boys tended to coo more than girls; that mothers of boys tended to spend more time with them ($p=.18$); and that mothers of boys tended to be more responsive to their babies cries ($p<.10$). In any event, the breakdown of which babies coo most and what they coo at, is as follows: of the 16 coos made by the 5 boys, 12 were at the mothers; of the 10 coos made by the 6 girls, only 3 were at the mothers (the others were at toys, hands, side of crib, etc.). This difference, that boys coo at their mothers and girls at other things, is significant ($p=.03$).

Thumb-Sucking and Behavior During Feedings. In both the Dutch and American samples, the babies settled down to a regular feeding schedule by two or three months, though the Dutch babies had been fed on a prescribed schedule from birth. By the age of two or three months, most babies could wait until the mothers were ready, but were also clearly ready to begin feeding promptly.

All of the Dutch babies sucked their thumbs at some age; only 2 of the U.S. babies did. The relationship between length of feeding and thumb-sucking is suggested here: recall that the average feeding for the Dutch babies was 13.6 minutes; for the American babies it was 30 minutes. Even within the Dutch sample, however, a significant relationship between length of feeding and thumb-sucking was found. Those babies with the shortest feedings (i.e., their feedings averaged less than 13 minutes) began sucking their thumbs earlier than those babies whose feedings were longer ($p < .01$).

In pursuing other possible relationships with thumb-sucking, tests were run to determine what other differences might be found between the more and less enthusiastic thumb-suckers. Those who sucked their thumbs most frequently were not quieter ($p=.61$), and their proportions of negative vocalizations to total vocalizations made were not higher ($p=.39$). However, the proportion of negative vocalization to their total waking hours was higher for the avid thumbsuckers ($p=.07$), i.e, those babies who suck their thumbs most are also whining and fussing and crying a larger proportion of their waking hours. It appears that thumbsucking either isn't comforting to them, or perhaps they would be fussing even more if they weren't busy sucking their thumbs.

There were some differences between the American and Dutch babies' behavior during the feedings. American babies tended to play, smile, laugh, gurgle, and coo; the Dutch babies were predominantly silent during the feedings, i.e., in 153 of the total 175 observed feedings (87.4%) the babies' did not vocalize at all. In the remaining 22 feedings (12.6%), the vocalizations of the babies were all vegetative groans and burps.

The babies were also physically quiet during 169 of the 175 (97.6%) feedings observed. They looked primarily at the mother, her face, eyes, breast, during 96 (54.9%) of the feedings. Visual searching and looking at other objects occurred in 23 (13.1%) of the feedings. The remainder of the time the babies either had their eyes closed (during 28 of the feedings, 16.0%) or stared blankly (28, 16.0%).

Visual Behavior. As was already shown in the preliminary analysis of the U.S. baby data, the U.S. babies tended to look less at their mothers and more at other things by three months of age. The Dutch babies at three months still show great visual interest in any person present, which is usually the mother. The Dutch babies look increasingly at their mothers with increasing age from 2 to 12 weeks (r_s=+.487, p =.17, one-tailed). This doesn't take into account whether or not someone is within range of the baby's vision and therefore the baby could be looking at someone; i.e, the correlation is deflated because most of the time the babies were awake they were alone. If you consider only that proportion of the time babies were awake that their mothers were within range of the babies' vision, and the proportion of that time that they looked at her, the correlation is much higher. The highest proportion of looking occurs at 10 weeks and drops off at 12 weeks; it is expected that the U.S. babies will show a decline in looking at their mothers earlier than the Dutch

babies.

Table 5

Proportion of Time When Mothers Were Within Visual Range That Babies Look at Her 2 weeks to 12 weeks

Age	Proportion
2 weeks	36.2%
4 weeks	48.4%
6 weeks	48.7%
8 weeks	50.6%
10 weeks	64.6%
12 weeks	61.8%

(r_s = +.94, p = .0083, one-tailed)

At three months of age, 3 of the Dutch babies looked only at the mother if she was within range. No relationship was found between this behavior and the frequency of presence of these mothers in general.

Considering the marked differences in amount of visual stimulation in the Dutch and American babies' environments, we may expect to find differences in the visual behavior of the babies. Categories of visual behavior to be compared and the relative proportion of each for the 11 Dutch babies are shown in Table 6.

The amount of time the Dutch babies are shown in Table 6, to be related to the visual behavior of the babies. Those babies whose mothers allowed them to spend more of their waking time in places other than bed tended to do more looking (including visual searching and looking at objects than the other babies (p = .07). These babies also tended to be quieter in general (p - .18).

Table 6

Babies' Visual Behavior

Category	Frequency	Proportion
Looking at Objects	194	15.6%
Looking at Toys	87	7.0%
Looking at Persons	250	20.0%
Searching	215	17.2%
Closed*	236	18.9%
Dull-Blank	265	21.2%

Note--Proportions of visual behavior in each category are expressed in percentages of observations made during babies' waking hours.

*Closed: more than half (58.5%) of the time their eyes are closed while awake, they are simultaneously crying or fussing.

The presence of toys did not make a difference in increasing the looking or searching behavior of those babies who had had toys from a comparatively early age, but relatively few of the Dutch babies had toys. If the presence of toys and pictures influences the babies' visual behavior, differences are likely to appear when comparisons between the American and Dutch samples are made. Dutch mothers expressed the view that things like toys might keep the babies awake, or overstimulate them; interestingly, the amount of sleep for the Dutch and American babies was about the same. Only two Dutch babies had toys from an early age (2 weeks) and these babies were not more wakeful than the others; indeed, one of the two slept more than any other baby; the other slept about the average for the Dutch sample.

Since the babies who have toys and are looking for them are therefore not engaged in some other visual behavior at the same time, one might wonder what other categories of visual behavior are changed for these babies. The difference seems to be in how much looking at objects the babies do: those babies who had toys looked at their toys and at other objects about the same proportion of time that babies who had no toys spent looking just at objects. The categories of looking at persons, visual searching, dull-blank, and closed, did not differ.

There was a slight tendency for those babies who did more looking (at persons, objects, and visual searching) to also sleep somewhat less ($p = .18$), but this may be related to the previously mentioned relationship between high looking and more time spent out of bed.

Physical Activity. The general activity level of the babies was measured by a simple count for each baby of his physical motions and gestures, which does not take into account the intensity of the gesture or length of time the gesture occupies. By this measurement, the girls were more active than the boys ($p = .07$).

No significant relationships were found between the activity level of a particular baby and other factors such as noise level in the environment; mother's caretaking behavior of the baby, etc. The only relationship which approached significance concerns sleep; those babies who were less active tended to sleep more ($p = .18$).

DISCUSSION

U.S. research suggests that stimulation is important in early infancy. Visual search (Fantz, 1966; Hunt, 1961; Piaget, 1952;

White, 1964), vocalization (Rheingold et al, 1959; Weisberg, 1963), smiling (Brackbill, 1958), and other forms of social behavior (Rheingold, 1966) are thought to be improved or facilitated by stimulation and responsiveness.

In addition, it has been suggested that interaction with the baby is most effective if it is contingent upon the baby's behavior (Weisberg, 1963; Bettelheim, 1967). Both European and American theorists suggest that scheduled interaction, stemming mainly from the parents, can lead to passivity (Bettelheim, 1967) and a general lack of basic trust (Erikson, 1960).

As has been demonstrated, Dutch parents schedule much of their interaction with their infants, and most interaction begins with the parent. Even if a parent sees a child awake and wanting to play or look around, and Dutch parents do see this, he is not likely to respond to this wish or to the behavior which implies this wish, because of fear of "spoiling" the baby (stated by 9 of the 11 mothers in Holland), or because of the belief that a baby in this age range should sleep and not play or stay awake.

That the scheduled and relatively infrequent interaction of Dutch mothers with their babies and the lack of visual stimulation in the babies' environments does not produce the damage in Dutch children that American theorists might expect raises some questions. Clearly one important factor must be not how much the mothers do, or even what, but how the mothers feel about the way they care for their babies. The Dutch mothers expressed confidence that they were raising their babies the right way; they

knew they were good mothers. It may be that an American mother whose external behavior resembles that of the Dutch mothers observed in this study behaves as she does with very different feelings and attitudes, i.e., an American mother who cares for her infant in a "Dutch" manner may do so because she rejects the infant, though this is clearly not so for the Dutch mothers. The lack of stimulation and infrequent interaction that American theoriets have come to associate with disturbances in child development are not necessarily related to a pattern of maternal rejection. The life of a Dutch infant is bare by American standards, but he is not rejected, and he does not show the disturbances which in American culture are associated with an environment which appears similar in its more observable characteristics.

In addition, the amount of environmental stimulation needed by a baby in the first 3 months of life to allow normal development may be less than we think. For example, White and Castle (1964) found minimal amounts of stimulation (20 minutes a day) in the first 30 days of life influenced visual search later. On the other hand, Ainsworth's (1967) data on the Uganda show that great amounts of environmental stimulare are related to speeded-up developmental quotients in the first year of life.

Perhaps there are also important personality characteristics related to environmental differences. For example, the Dutch feel that American children learn to want change in the environment and consider this a negative trait, while we tend to equate this with inquisitiveness and curiosity (see, e.g., Uzgiris and Hunt, 1965).

As is apparent, this research is not meant to be evaluative. Both cultures may be training very different kinds of people, yet with each culture wanting the ones they produce.

The question raised by this research has been partially answered: are there differences between Dutch and American babies? It is clear that there are differences in their environments. Yes, there are some differences between the babies, as outlined above. However, what are clearly needed are some general measures on many Dutch children, especially in three areas thought to be affected by stimulation. Helpful to obtain would be (1) a general developmental quotient (e.g., Griffiths or other baby tests which measure vocalization, motor development, social responsiveness, etc.), (2) a measure of visual acuity and visual search, and (3) a measure of exploratory behavior. These data are presently being collected in Holland.

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