INFANT CARE AND DEVELOPMENT IN URBAN ZAMBIA

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Summary

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Mother - Infant interaction was observed in the natural setting in order to assess cognitive and motor development in Zambian children and explore the relationship between early maternal handling and later development. The study revealed that the homes of these infants were characterised by high frequency and stability of contacts with adults, and great variety of experience, but little deliberate stimulation of development of motor, cognitive or linguistic abilities, eg. through toys, or opportunity for play other than incidental.

Zambian infants' motor development at 4 months was 3 weeks in advance of American infants. This was attributed to the constant physical stimulation in the early months through contact with the mothers while being carried on her back. Sensorimotor development, advanced at 6 months tended to decrease at 9 and 12 months; similarly, space exploration. This was attributed to lack of opportunity for exploration, and compliance with adult standards - removal of objects being tantamount to prohibition. The restriction of attention to the task, and lack of curiosity regarding objects in the periphery noted in Zambian infants was explained as possibly due to lack of experience in manipulating objects and lack of opportunity for self production of contingencies.

Report

The mother has always been considered an important influence upon the development of the growing infant, but until recently there were few efforts to study or observe mother-infant interaction in the natural setting. We have also become aware that in addition to providing necessary physical care and emotional stability for the infant, the mother and the experiences she provides lay the foundations for cognitive development. In this study we observed mothers and infants in their homes, assessed both cognitive and motor development,and explored the relationship between early maternal handling and later development.

Our subjects were 38 infants in an urban township of Lusaka who were visited in their homes at 4, 6, 9, and 12 months. A major difficulty in longitudinal projects is that of subject attrition and this was no exception. Four infants died during the course of the study and 6 others were seriously ill during various testing periods. Four families moved and we were unable

to regain contact with them. Of the 38 infants we initially visited, 25 were seen at the last visit. The families we visited represented 16 different tribes and ranged in size from 3-17 persons with a mean of 7. Occupation of the fathers ranged from labourers to small shop owners. Only 4 fathers had been to secondary school, but only one mother had secondary school training. Most mothers' education included several grades of primary school. One had completed primary school. When we first began visiting, none of the mothers were employed outside the home, but by the end of the study four mothers were working away from home all or part of the day.

At the four month visit, an observer coded mother-infant interactions in 10 second blocks of time for 10 minutes. We also administered the Bayley Motor Scale. At 6, 9, and 12 months we administered the Albert-Einstein Sensorimotor Scales which are based upon Piaget's theories of sensorimotor development. They include a Prehension Scale, which measures development of visually directed reaching; a Space Scale, which tests development of the ability to follow and predict trajectories of objects in space and spatial relations; and an Object Permanence Scale, which assesses the ability to conceive of an object's existence independently of the infant's perceptual contact with it. At the end of the study we completed the Home Stimulation Inventory (Caldwell, 1969). This is an inventory which describes the home environment with respect to the infant upon the basis of observations and an interview with the mother. All testing was carried out by two Zambian female assistants in the homes or in the gardens outside of the homes.

A brief summary of results based upon analysis completed to date follows. The reader is referred to the publications listed at the end of this report for more detailed discussion.

Mother-infant interaction

The most frequent behaviours were holding, looking at, and touching the infant. Talking to and playing with the infant occurred only rarely. In general, more time was spent in physical stimulation (holding, touching) than in non-physical stimulation (looking, and talking). There were no sex differences in infant behaviour or maternal handling. Maternal behaviour was related to family size and structure. Mothers in smaller families were more attentive to their infants. Mothers in extended as opposed to nuclear families were more likely to talk to and play with their infants, behaviours which were otherwise rare in our sample. It was suggested that the presence of other caretakers in the family probably enabled the mother to spend more time in non-essential interactions with her infant such as talking and play.

Home Environment

The Home Stimulation Inventory indicated that the homes of these infants could be characterized by high frequency and stability of contacts with adults, great variety of experience (probably greater than most Western infants), but little deliberate stimulation of development of motor, cognitive or linguistic abilities. None of the families bought toys or made toys for their infants. Mothers reported that their infants played with objects routinely found in the home and garden,such as,sticks and stones, water and sand, cooking utensils and bottletops. However, we rarely observed children engaged in manipulation of such objects and concluded that mothers did not provide such materials for infants' play but rather the opportunity for such play occurred incidentally.

Motor Development

We predicted that because Zambian infants received constant physical stimulation in the early months through contact with the mother while carried in the sling on her back, their motor development would be advanced in comparison with Bayley test norms. This prediction was confirmed. At four months the mean score we obtained was 1.5 standard deviations above the mean reported by Bayley (1969) and the behaviour observed was that characteristic of American infants 3 weeks older.

Sensorimotor Development

On the Prehension Scale, 23 of 33 subjects were performing at the most advanced level at six months when we first adminstered the scale. The remainder had achieved successful reaching by the 9 month visit. This is comparable to the data reported by Corman and Escalona (1969) for their validation sample.

On the Object Permanence Scale, Zambian infants were slightly advanced at the 6 month visit than the Corman and Escalona (1969) sample, but less advanced at 9 and 12 months. A similar pattern emerged for the Space Scale. However, Zambian infants were significantly more advanced on the Space Scale than the Object Scale at every age, whereas American infants had generally been more advanced on the Object Scale. One possible explanation is that we had great difficulty in getting infants to search hidden objects, a difficulty which did not seem to reflect lack of object permanence, but rather lack of exploratory activity in general and possibly compliance with adult standards. Possibly infants have already learned that adult removal of objects is usually tantamount to a prohibition. In comparison to the European pilot subjects we tested Zambian infants were remarkably "good". They never crawled away from the task, never tried to drag out the toys not in use and never were inattentive to the task at hand. Our European pilot subjects were difficult to test because of the frequency of these kinds of behaviours. Our Zambian infants were difficult to test on the object scale because they were "too good". Another possible explanation is lack of experience in manipulating objects. As noted earlier mothers did not regularly provide opportunities for such experiences.

Thus far, no measure of maternal behaviour in terms of frequency of occurrence has been predictive of later measures of cognitive development. Analysis currently in progress will consider patterns of interaction rather than simple frequencies. Similarly, none of the measures of home stimulation were related to performance on the sensorimotor scales. However, previous studies of infants from different backgrounds have typically failed to find developmental differences in the first two years of life. Those studies which report such differences (Wachs, Uzgiris and Hunt, 1971; Golden and Birns, 1968) have reported differences in difficulty of testing and number of administrations required to score behaviour rather than in level of performance obtained. Our difficulty in testing Zambian infants may reflect a similar phenomenon. We also found at 9 months that many infants showed intense stranger anxiety which made testing difficult. For these two reasons the 9 and 12 month data on the sensorimotor scales is suspect as an adequate estimate of these infants' abilities.

The finding of early acceleration on both sensorimotor and motor scales may reflect a particularly appropriate "match" between child care practices and the needs of very young infants. Lewis and Goldberg (1969)

have argued that the extent to which maternal behaviour is contingent upon infant behaviour is an important factor in cognitive development. It is this contingency which enables the infant to learn that his behaviour has consequences. Later the infant produces his own reinforcements through opportunities provided by the mother for manipulation within the environment. In the early months, when the Zambian infant is on his mother's back, she is able to respond immediately to his signals and needs, acting as a highly successful contingency producer. Later on, when the infant spends much of his time seated on a mat in the yard, Zambian infants seem to lack opportunities for manipulating objects, and for self-production of contingencies.

Papers from the study

Goldberg, S. Infant care in Zambia: measuring maternal behaviour. Human Development Research Unit Report 13, University of Zambia, Lusaka, 1970. (Adapted from a paper presented at the University Social Science Conference, Nairobi, Kenya, December, 1969).

Goldberg, S. Infant care, stimulation and sensorimotor development in a high density urban area of Zambia. Human Development Research Report, 15 University of Zambia, Lusaka, 1970.

Goldberg, S. Infant care and growth in urban Zambia. Human Development, 1972, in press. (Based upon a paper contributed to the Symposium on Cross Cultural Studies of Infancy, Society for Research in Child Development, Minneapolis, Minnesota, April, 1971.

Goldberg, S. Mother-infant interaction and sensorimotor development in urban Zambia. Chapter to appear in S. Tulkin (Ed.) Around the World in the First Year of Life, in progress.

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Corman, H.H. and Escalona, S.K. Stages of sensorimotor development: a replication study. Merrill-Palmer Quarterly, 1969, 15, 157-170.

Golden, M. and Birns, B. Social class and cognitive development in infancy. Merrill-Palmer Quarterly, 1968, 14, 137-149.

Lewis, M. and Goldberg, S. Perceptual-cognitive development in infancy: a generalized expenctancy model as a function of mother-infant interaction. Merrill-Palmer Quarterly, 1969, 15, 81-100.

Wachs, T., Uzgiris, I.C. and Hunt, J. McV. Cognitive development in infants of different age levels and from different environmental backgrounds. Merrill-Palmer Quarterly, 1971, 17, 283-318.